STATE OF MARYLAND

PUBLIC SERVICE COMMISSION

January 19, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street, 16th Floor
Baltimore, Maryland 21202

RE: Petition for Implementation of a Statewide Electric Vehicle Portfolio

Dear Mr. Collins:

As the leader of the Public Conference 44 ("PC44") Electric Vehicle Work Group ("EV Work Group"), I respectfully submit the attached proposal and recommend that the Public Service Commission of Maryland ("Commission") convene a docketed proceeding to consider the implementation of a coordinated Statewide Electric Vehicle Portfolio. Because the Proposal relies on participating electric companies to serve as program administrators, the following electric companies are deemed as joint signatories: Baltimore Gas and Electric Company; Delmarva Power & Light Company; Potomac Electric Power Company; and The Potomac Edison Company. Further, the following parties also join this filing as signatories: ChargePoint, Greenlots, Natural Resources Defense Council, Sierra Club, Chesapeake Climate Action Network, 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.

Although the proposal does not constitute a consensus document from all members of the work group, it did benefit from the formal and informal feedback provided by members of the PC44 EV Work Group over the course of numerous meetings conducted throughout calendar year 2017. Further, in addition to the joint signatory parties, the Proposal is bolstered by the support of a broad cross-section of stakeholders, including: members of the Maryland General Assembly; automobile manufacturers; local governments and municipalities; locally-owned private businesses; civic, neighborhood, and trade associations; local development groups; limited- and moderate-income advocates; environmental advocates; and EV private market participants. A complete compilation of letters received from these supporting entities is provided as Attachment J to this document.

I would like to express my gratitude to members of the PC44 EV Work Group for their extensive and constructive engagement in these matters, and I would also like to thank the Commission for the opportunity to work on this important aspect of our grid modernization efforts.

Sincerely,

Marissa Paslick Gillett, esq.
PC44 Electric Vehicle Work Group Leader

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cc: W. Kevin Hughes, Chairman
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Thomas Ashley on behalf of Greenlots
Noah Garcia on behalf of Natural Resources Defense Council
Joshua Berman, Counsel to Sierra Club
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PC44 Electric Vehicle Work Group Email Distribution List

Proposal to Implement a Statewide Electric Vehicle Portfolio

Designed to: Address Barriers to the Deployment of Electric Vehicles; Increase the Efficiency and Reliability of the Electric Distribution System; and Lower Electricity Use at Times of High Demand

PC44 Electric Vehicle Work Group Leader
Baltimore Gas and Electric Company
Delmarva Power & Light Company
Potomac Electric Power Company
The Potomac Edison Company
ChargePoint
Greenlots
Natural Resources Defense Council
Sierra Club
Chesapeake Climate Action Network
Institute for Energy and Environmental Research
Marylanders for Energy Democracy and Affordability
Pace Energy and Climate Center
Solar United Neighbors of Maryland
Nuclear Information and Resource Service

January 19, 2018

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The Public Conference 44 ("PC44") Electric Vehicle ("EV") Work Group Leader, Baltimore Gas and Electric Company ("BGE"), Delmarva Power & Light Company ("Delmarva"), Potomac Electric Power Company ("Pepco"), The Potomac Edison Company ("PE"), ChargePoint, Greenlots, Natural Resources Defense Council, Sierra Club, Chesapeake Climate Action Network, 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 (collectively, the "Signatory Parties"), respectfully request that the Public Service Commission of Maryland ("Commission") issue an Order that: (1) approves the implementation of the Maryland Electric Vehicle Portfolio ("EV Portfolio"),[1] comprised of sub-portfolios and programs proposed by BGE, Delmarva, Pepco, and PE (the "Utilities"); (2) authorizes the associated cost recovery mechanisms discussed herein; (3) grants the requested limited, temporal waivers of certain COMAR regulations pertaining to electric submetering; and (4) authorizes the use of up to $370,000 of grid modernization funding pursuant to Commission Order No. 88128 for the purposes identified herein. The Signatory Parties respectfully request that the Commission docket this proceeding and adopt the procedural schedule articulated herein, which culminates in the issuance of a Commission order in these proceedings no later than May 18, 2018 so as to facilitate the launch of the statewide EV Portfolio by July 1, 2018.

[1] The Maryland Electric Vehicle Portfolio, referred to herein as the "EV Portfolio", is comprised of initiatives and pilots proposed by BGE, Delmarva, Pepco, and PE that, if approved, would deploy targeted investments in support of: electric vehicle supply equipment; innovative EV-related rate design options; EV-related technology demonstration projects; and EV-related customer education and outreach campaigns. The specific components of the EV Portfolio are described in Section IX and Attachments C – G of this Proposal.

I. Introduction and Background

The electrification of the transportation sector presents real challenges for the State's electric distribution system; however, if managed properly, it also offers real opportunities for private market participants, ratepayers, and the utility sector to act in concert and ensure that State policy objectives are realized in a manner consistent with the overarching statutory directive to promote adequate, economical, and efficient delivery of utility services without unjust discrimination.[2] Through its inclusion of electric vehicles as a defined element in the scope of PC44, the Commission recognized that the electrification of the transportation sector represents a potential disruptive force worthy of inclusion in a comprehensive grid modernization proceeding. As noted by the Commission, the EV market share is expected to grow significantly in the next decade, and while such widespread adoption will reduce harmful health and environmental effects of automotive transportation, it could also impact our electric grid,[3] thereby requiring a proactive approach to facilitate the seamless integration of new and emerging EV-related technologies.

Thus, the Commission outlined a series of potential actions that could be pursued by a newly-formed EV Work Group in the context of a statewide grid modernization proceeding (*i.e.* PC44).[4] Specifically, the Commission tasked the PC44 EV Work Group with, at a minimum, pursuing desired outcomes that generally correspond to the following goals: (1) increasing and diversifying EV tariff offerings across multiple service territories and customer classes; (2) planning for a limited utility infrastructure investment in electric vehicle supply equipment ("EVSE"); (3) developing a strategy to address grid-related costs associated with vehicle fleet

[2] Public Utilities Article, *Annotated Code of Maryland* ("PUA") § 2-113 (a)(1)(i)(2).
[3] ML#212176: *Public Service Commission of Maryland Public Conference 44 Notice* (Jan. 31, 2017) at 7.
[4] *Id.* at 3, 9.

electrification; (4) facilitating and encouraging equitable access to benefits derived from vehicle fleet electrification, especially in underserved market segments; and (5) developing a customer education, outreach, and engagement strategy in coordination with other state agencies to promote the outcomes of the PC44 EV Work Group proceeding.[5]

In pursuit of the aforementioned goals, the PC44 EV Work Group was guided by certain principles intended to inform the development of potential solutions in a manner so as to be consistent with the Commission's vision for the future of Maryland's electric distribution system. Of particular import included the guiding principles outlined in the Commission's January 31, 2017 PC44 Notice related to: competitive markets; the seamless integration of new technologies; universal access to reliable, cost-effective, and environmentally sustainable electric service; collaboration between stakeholders; and the appropriate role of electric distribution companies moving forward.[6]

A. State Policies Related to Electric Vehicles

In addition to the guiding principles outlined by the Commission at the outset of its grid modernization proceeding, the State of Maryland has adopted several relevant policies related to the advancement of electric vehicles and charging infrastructure that served to inform the activities of the PC44 EV Work Group and the development of the Proposal described herein, including: the State's Greenhouse Gas Reduction Act; the eight-state Zero-Emission Vehicle Memorandum of Understanding; Maryland's role in the Transportation Climate Initiative; and the legislatively-created Electric Vehicle Infrastructure Council. A discussion of these State policies and how they interact with the proposed EV Portfolio follows below.

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[5] These five goals were deduced by the EV Work Group based on the guidance articulated in the Commission's January 31, 2017 PC44 Notice, including the list of seven "possible actions" delineated therein. *Id.* at 7-9. In turn, the EV Work Group developed a matrix, appended to this Proposal as Attachment A, which contemplated specific objectives designed to achieve the aforementioned goals.

[6] ML#212176: *Public Service Commission of Maryland Public Conference 44 Notice* (Jan. 31, 2017) at 3-4.

Greenhouse Gas Reduction Act

On April 4, 2016, Governor Hogan signed into law an ambitious goal with bipartisan support: the reauthorization of the State's Greenhouse Gas Reduction Act ("GGRA"), targeted at reducing statewide greenhouse gas emissions 40% from 2006 levels by 2030.[7] In developing and implementing the GGRA Plan, the legislation tasked the Maryland Department of the Environment ("MDE") with considering a number of factors, including whether any measures adopted as part of the Plan would result in an increase in electricity costs to consumers in the State.[8] The GGRA legislation also mandates that MDE ensure planned mitigation measures: do not directly cause a loss of existing jobs in the manufacturing sector; produce a net economic benefit to the State's economy and a net increase in jobs in the State; and are implemented in an efficient and cost-effective manner.[9]

One such mitigation measure on which the State intends to rely is advancing the deployment of electric vehicles, given the lack of tailpipe emissions and lower lifecycle emissions of EVs as compared to gasoline- and diesel-powered vehicles, especially as Maryland pursues its efforts to further decarbonize the grid.[10] The electrification of the vehicle fleet is important not only because the transportation sector accounts for approximately one-third of Maryland's greenhouse gas emissions, but also because it represents a mitigation measure that relies on technological solutions that bolster manufacturing and other jobs in the State – such as at the General Motors Allison Transmission plant in White Marsh, which has significantly expanded its capacity and new hires to manufacture electric motors and drive trains.[11] Further, while ratepayer support for EV charging infrastructure, as proposed herein, may in the short-term

[7] 2016 Md. Laws, Ch. 011.
[8] Env't § 2-1206(6).
[9] Env't § 2-1206(8).
[10] ML#194882: *Statement of Maryland Dept. of the Env't Secretary Ben Grumbles, PC43* (July 18, 2016).
[11] *Id.*

result in a small increase in electricity costs to consumers in the State, by 2030 annual benefits associated with the adoption of EVs are projected to be $230 (net present value) per plug-in electric vehicle deployed in Maryland, which includes direct offsets to utility bills through an increase in revenues associated with EV charging.[12]

As observed by MDE, investing in charging infrastructure today will hasten vehicle fleet turnover and position Maryland to meet its 2030 GGRA goal.[13] While mindful of the important role that the private sector will continue to play, great efficiencies can be realized by capitalizing on the electric utilities' proven ability to assist in the accelerated deployment of charging infrastructure in the near-term – efficiencies that should be seized upon so that Maryland citizens realize the State's greenhouse gas reduction goals in the most efficient and cost-effective manner possible.

Zero-Emission Vehicle Memorandum of Understanding

The Zero-Emission Vehicle Memorandum of Understanding ("ZEV MOU") was signed on October 24, 2013 by the governors of eight states – California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont – and represents a commitment to coordinated action to ensure the successful implementation of state zero-emission vehicle programs.[14] Collectively, the eight signatory states committed to having at least 3.3 million ZEVs operating on their roadways by 2025; Maryland's share of this commitment is estimated to be 300,000 ZEVs.[15]

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[12] D. Lowell et al. *MJB&A Analyzes State-Wide Costs and Benefits of Plug-in Vehicles in Five Northeast and Mid-Atlantic States* (Feb. 14, 2017), http://www.mjbradley.com/reports/mjba-analyzes-state-wide-costs-and-benefits-plug-vehicles-five-northeast-and-mid-atlantic.

[13] ML#194882: *Statement of Maryland Dept. of the Env't Secretary Ben Grumbles, PC43* (July 18, 2016).

[14] *Multi-state ZEV Task Force*, NESCAUM, https://www.zevstates.us/ (last visited Dec. 29, 2017).

[15] Maryland Dept. of Transp., *Electric Vehicle Infrastructure Council Annual Report* (Dec. 31, 2017), at 3, *available at:* http://www.mdot.maryland.gov/newMDOT/Planning/Electric_Vehicle/Documents/EVIC_2017_Annual_Report_Final_12-31-2017.pdf.

For Maryland, the ZEV MOU goal is an ambitious one, given that the total number of plug-in electric vehicles registered in the State as of fiscal year 2012 equated to 609.[16] The numbers have risen dramatically, however, in the intervening years, especially as the number of EV models available for purchase in the State increased from two battery electric vehicle ("BEV") models to 15 BEV and 20 plug-in hybrid electric vehicle ("PHEV") models by fiscal year 2017.[17] Indeed, the total number of EVs registered in Maryland climbed to almost 9,400 by June 30, 2017, split between BEVs (40%) and PHEVs (60%).[18]

Transportation Climate Initiative

The Transportation Climate Initiative ("TCI") is a regional collaboration comprised of 12 Northeast and Mid-Atlantic jurisdictions. Supported by the Georgetown Climate Center, the TCI states focus on developing the clean energy economy, improving transportation, and reducing carbon emissions in the transportation sector. A group of TCI states, including Maryland, recently released a statement seeking public input on potential policy approaches to bring about a cleaner and more resilient transportation future across the Northeast and Mid-Atlantic region. According to the statement, starting in the fall of 2017 and continuing into 2018, the TCI states plan to engage communities and businesses in conversations that explore the opportunities and benefits achievable through coordinated state action. In support of the planned initiative, MDE Secretary Ben Grumbles remarked that, "Maryland is a leader in fighting climate change, and this bipartisan, regional effort to address greenhouse gases in the transportation sector is a great opportunity to share our approaches and learn from others."[19] The collaborative stakeholder

[16] *Id.* at 7.
[17] *Id.*
[18] *Id.* at 8.
[19] *Northeast and Mid-Atlantic States Seek Public Input as They Move Toward a Cleaner Transportation Future*, TCI (Nov. 13, 2017), http://www.transportationandclimate.org/northeast-and-mid-atlantic-states-seek-public-input-they-move-toward-cleaner-transportation-future.

effort undertaken by the PC44 EV Work Group is an approach that can be readily shared with fellow TCI states, just as lessons-learned from other states will flow through during implementation of the proposed Maryland EV Portfolio described herein.

Electric Vehicle Infrastructure Council

The Electric Vehicle Infrastructure Council ("EVIC" or the "Council") was established by the Maryland General Assembly through legislation enacted during the 2011 session.[20] As part of its legislative charge, the EVIC is tasked with the evaluation of incentives for the ownership of EVs and the purchase of EV charging equipment; the development of recommendations for a statewide infrastructure plan; and the development of other potential policies to promote the successful integration of EVs into the State's communities and transportation network.[21] The EVIC released its Infrastructure Plan in 2012, finding that the establishment of adequate charging infrastructure is necessary to alleviate "range anxiety."[22] Indeed, the Council determined that the establishment of a visible charging network should be a State priority given Maryland's goal of widespread adoption of electric vehicles.[23]

In the years since the release of its Infrastructure Plan, the infrastructure-related activities of the EVIC have largely focused on the installation of EVSEs at state-owned or leased facilities and along the Alternative-Fuel Corridors approved by the U.S. Department of Transportation.[24]

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[20] 2011 Md. Laws, Ch. 400 and 401.

[21] *Id. See also,* Maryland Dept. of Transp., *About the Council,* http://www.mdot.maryland.gov/newMDOT/Planning/Electric_Vehicle/About_the_Council.html (last visited Dec. 29, 2017).

[22] EVIC, *Final Report to the Governor and Maryland General Assembly* (Dec. 1, 2012) at 12 - 13, *available at:* http://www.mdot.maryland.gov/Office_of_Planning_and_Capital_Programming/Electric_Vehicle/Documents/2012_Final_Report.pdf.

[23] *Id.* at 13.

[24] The designation of the Maryland highways as EV corridors was completed on November 3, 2016. In response to the announcement, R. Earl Lewis, Jr., Deputy Secretary for Policy, Planning, & Enterprise Services at the Maryland Department of Transportation said, "The Maryland Department of Transportation is very excited about the news that the U.S. Department of Transportation's Federal Highway Administration has designated 462 miles of Maryland highways as Alternative Fuel / Electric Vehicle Corridors. This designation is another great step forward to give drivers the confidence to count on their electric and alternative fuel vehicles for short and long trips. Having electric

In 2017, however, the Council denoted as a priority the need to maximize the use of grant and alternative funding opportunities to support additional charging infrastructure in Maryland, especially to ensure that EVSE deployment is encouraged statewide and beyond the charging corridors.[25] Updates regarding the PC44 EV Work Group and the potential use of ratepayer funding in support of EVSE deployments that would coincide with the Council's identified infrastructure-related priorities were discussed at EVIC meetings held on March 16, May 25, July 20, September 21, and November 14, 2017.[26] Further, there is a significant overlap between the Council's membership and the PC44 EV Work Group, so that the instant Proposal benefited from the perspective of those stakeholders engaged in the EVIC's activities since 2011.

According to the EVIC, in reliance on data provided through the U.S. Department of Energy's Station Locator, there existed over 450 EV charging stations and over 1,100 public outlets available in the State as of September 2017.[27]

Other Related State Actions and Available Incentives

In 2017 the Maryland General Assembly enacted legislation requested by Governor Hogan and supported by the EVIC, entitled the Clean Cars Act of 2017, which extended through fiscal year 2020 the EV Recharging Equipment Rebate Program administered by the Maryland Energy Administration ("MEA") and provided the necessary authorization to issue motor vehicle excise tax credits for specified qualified plug-in electric drive vehicles.[28] The EV Portfolio

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vehicle corridors in every corner of our state from I-70 in Western Maryland to US 50 all the way to Ocean City will provide great value to Maryland citizens and businesses as the public and private sector work together to expand this infrastructure. Working with our federal, state and regional partners, we can make Maryland's electric vehicle deployment and greenhouse gas reduction goals a reality." http://www.transportationandclimate.org/us-department-transportation-designates-electric-vehicles-corridors-transportation-and-climate

[25] Maryland Dept. of Transp., *Electric Vehicle Infrastructure Council Annual Report* (Dec. 2017), at 11, *available at:*http://www.mdot.maryland.gov/newMDOT/Planning/Electric_Vehicle/Documents/EVIC_2017_Annual_Report_Final_12-31-2017.pdf.

[26] *Id*. at 10 - 11.

[27] *Id*. at 8.

[28] 2017 Md. Laws, Ch. 362.

proposed herein is designed with these incentives in mind, given that the rebate amounts reflected in this Proposal are offered in percentages net of any other available State or federal incentives.

The Maryland EV Recharging Equipment Rebate Program represents a much-needed incentive to promote the deployment of charging infrastructure in the State; however, it is capped at $1.2 million through fiscal year 2020.[29] Similarly, other potential (non-ratepayer) funding sources to support charging infrastructure deployment are capped, such as the limitation that only 15% (or $11.25 million) of total state funds made available through the Volkswagen settlement can be used on light duty electric vehicle infrastructure.[30] While admirable, the combined $12.45 million available through the aforementioned opportunities is not projected to close the gap in EV charging infrastructure needed to support the State's ZEV MOU goal of 300,000 electric vehicles on the road by 2025.

Members of the PC44 EV Work Group acknowledged from the beginning that it is not the responsibility of ratepayers to foot the bill for the entirety of the remaining charging infrastructure needed to fill the gap between what exists today and the projected infrastructure build-out necessary to support the State's ZEV MOU goal of 300,000 electric vehicles on the road by 2025. The Signatory Parties contend, however, that a case can certainly be made – and indeed *is* made through this Proposal – that a targeted ratepayer investment facilitated by the Utilities and made in conjunction with private market participants will seed the burgeoning Maryland EV landscape in a manner that will promote a healthy, competitive, and lasting private market moving forward.

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[29] State Gov't § 9-2009(c)(2).
[30] Maryland Dept. of Env't, *Volkswagen Settlement Presentation*, slide 8, http://mde.maryland.gov/programs/workwithmde/Documents/AQCACVWPresentationDieselRoundtable06192017.pdf.

B. Overview of Electric Vehicle Work Group Activities

Following issuance of the Commission's January 31st Notice, and after allowing for an initial period during which interested stakeholders could assemble, the Commission-designated work group leader convened the PC44 EV Work Group on February 24, 2017, followed by the inaugural in-person meeting held on March 8, 2017. The first meeting of the Work Group was attended by over 80 stakeholders either in-person or remotely, and focused on an overview of the Commission's PC44 Notice and proposed action items, as well as a recap of previous EV-related pilots conducted by BGE and Pepco. Stakeholders also suggested clarifications to, or expansions of, the goals and objectives to be pursued by the PC44 EV Work Group throughout 2017.

Subsequent PC44 EV Work Group meetings were held on April 24 and June 1, 2017, and featured presentations from industry experts designed to provide a common baseline understanding for a potential State-specific framework moving forward. Specifically, stakeholders benefited from presentations made by:

- The Georgetown Climate Center, *Charging Ahead – Options for Policymakers Regarding the Regulation of Electric Vehicle Charging Markets*;
- MJ Bradley & Associates, *Electric Vehicle Cost Benefit Analysis: Plug-in Electric Vehicle Cost-Benefit Analysis for Maryland*;
- The Maryland Department of the Environment, *Volkswagen Settlement Briefing*;
- ChargePoint, *Exploring the Utility Role*; and
- Sierra Club, *Utility Role in Accelerating Electric Vehicle Deployment*.

Following each of the above presentations, members of the PC44 EV Work Group engaged in a lengthy dialogue regarding the material and how it would intersect with pending action items. Members of the PC44 EV Work Group were also invited during this time to participate in several facilitated homework assignments, the responses to which were used to draft a bank of potential pilots, initiatives, and metrics to be considered in the development of the instant Proposal.

Responses to the homework assignments were also used to construct a one-page matrix reflective of the goals and objectives of the PC44 EV Work Group, appended to this Proposal as Attachment A.

In addition, several meetings of the PC44 EV Work Group were held throughout the summer of 2017 with smaller groups of similarly-situated stakeholders so that specific next steps could emerge. A summary of these meetings and a detailed work plan for the remainder of 2017 were provided as part of the August 15, 2017 PC44 EV Work Group meeting, during which time additional industry expert presentations were made by:

- EPRI, *State of the Electric Vehicle and Charging Infrastructure Market*; and
- SEPA, *Utilities & Electric Vehicles: The Case for Managed Charging*.

On September 20, 2017, the PC44 EV Work Group convened again, this time to receive presentations from the Utilities regarding conceptual ideas for programs and pilots that could support the goals and objectives identified in Attachment A. Additionally, the PC44 EV Work Group benefited from a presentation by the Pace Energy and Climate Center regarding a conceptual idea for a pilot project to develop an EV car-share program to provide an affordable and sustainable transportation option for low- and moderate-income ("LMI") customers, which is one example of a type of program that could be supported by the Rocky Mountain Institute's conceptual proposal to study electric mobility solutions for LMI customers, described in Attachment H. Representatives from the National Renewable Energy Lab ("NREL") were also present to lead a discussion surrounding a tool developed to identify gaps in EV charging infrastructure. Stakeholders were encouraged to engage in a dialogue during the September 20 meeting, and subsequently to provide additional feedback on the meeting presentations in writing over the next several weeks.

The PC44 EV Work Group next met on November 7, 2017 for the purpose of receiving more detailed briefings on the EV proposals under development by the Utilities. The presentations reflected feedback provided by stakeholders to-date, and were further refined throughout the remainder of calendar year 2017 as conversations among various stakeholders progressed. The last formal meeting of the PC44 EV Work Group was conducted on December 1, 2017 by teleconference, and served as an additional opportunity for stakeholders to provide real-time input or to pose questions regarding the pending proposals. During the December 1 meeting, the PC44 EV Work Group leader also presented an outline of the instant document and solicited verbal or written feedback by December 13, 2017.

In total, approximately 150 persons subscribed to the PC44 EV Work Group distribution list by the close of calendar year 2017, which spans organizations representing state and local government; private market participants in EVSE and other technologies; third-party retail suppliers; academia; environmental advocates; limited-income advocates; utilities and electric cooperatives; trade associations; energy consultants; and private citizens. As noted above, opportunities for this significant gathering of stakeholders to provide valuable input into the instant Proposal were both numerous and instrumental in the shaping of the final product. In consideration of the comments and discussions with stakeholders, each of the participating Utilities shaped and subsequently adjusted their proposals, examples of which are appended as Attachment B.

C. Proposed Procedural Schedule

In its January 31, 2017 PC44 Notice, the Commission stated that although efforts to modernize Maryland's electric distribution systems would remain ongoing and continue far into the future, action items identified in the Notice should be completed by June 2018.[31] Further, as explained above, the State's 2025 ZEV MOU target is looming, and requires significant resources and ramp-up time in order to deploy the charging infrastructure necessary to support a more widespread EV adoption. Indeed, an accelerated near-term deployment of EV infrastructure is envisioned as necessary to support a healthy, competitive EVSE market in the long-term. Thus, the Signatory Parties respectfully request that the Commission adopt the following proposed procedural schedule designed to yield a Commission decision on these matters no later than May 18, 2018.

i. Comment Deadline: Friday, March 2, 2018 at 5:00 p.m.

ii. Reply Comments Deadline: Monday, March 26, 2018 at 5:00 p.m.

iii. Legislative-Style Hearings: April 5 – 6, 2018, beginning at 10:00 a.m.

iv. Commission Decision: May 18, 2018

[31] ML#212176: *Public Service Commission of Maryland Public Conference 44 Notice* (Jan. 31, 2017) at 6.

II. Statutory Authorization for the Proposed EV Portfolio

In 2011 the Maryland General Assembly enacted several pieces of legislation related to electric vehicles,[32] including Senate Bill ("SB") 179 / House Bill ("HB") 164, which required the Commission to establish, by June 30, 2013, "a pilot program for electric customers to recharge electric vehicles during off-peak hours."[33] SB 179 / HB 164 directed the Commission to make every effort to include at least two electric companies in the pilot program, and further delineated options for incentives that the Commission could authorize to encourage residential, commercial, and governmental customers to recharge electric vehicles in a manner that increases the efficiency and reliability of the electric distribution system.[34] As prescribed by the legislation, the Commission is empowered to authorize incentives such as: (1) time-of-day pricing; (2) credits on distribution charges; (3) rebates on the cost of charging systems; (4) demand response programs; or (5) other incentives approved by the Commission.[35] On August 12, 2013, the Commission issued Order No. 85776 approving EV pilot programs for BGE and Pepco, which reflected a combination of rebates on the cost of charging systems (Pepco), nascent demand response offerings (Pepco), and TOU pricing (BGE and Pepco) to incent residential EV customers to charge off-peak.[36]

Of further note with respect to SB 179 / HB 164 is a section of uncodified language, which explicitly states that nothing in the legislation was to be construed as a limitation on the Commission's existing authority to receive, consider, and approve proposals in advance of the

[32] Other legislation enacted during the 2011 session included SB 176 / HB 167, which established the Electric Vehicle Infrastructure Council. 2011 Md. Laws, Ch. 400 and 401.
[33] 2011 Md. Laws, Ch. 403, codified at PUA § 7-211(m).
[34] PUA § 7-211(m)(2)-(3).
[35] PUA § 7-211(m)(4).
[36] Case No. 9261, *In the Matter of the Investigation into the Regulatory Treatment of Providers of Electric Vehicle Charging Stations and Related Services*.

date specified for establishment of an EV pilot program (*i.e.* June 30, 2013).[37] Thus, it is reasonable to conclude that the General Assembly acknowledged the Commission's inherent authority to deploy ratepayer dollars in support of EV-related incentives designed to encourage an efficient use of the electric grid as outlined in the legislation, but felt compelled to codify the Legislature's intent that EV pilot programs emerge for consideration on the specified timeline.[38]

Indeed, programs designed to promote the adequate, economical, and efficient delivery of utility services fall squarely within the Commission's jurisdiction and duty to supervise and regulate public service companies as codified in PUA § 2-113. Moreover, a great deal of discretion is vested in the Commission in order that it may properly discharge its important and complex duties,[39] and the Commission's powers are to be construed liberally.[40] Finally, the Commission, in supervising and regulating public service companies, must consider the conservation of natural resources and the preservation of environmental quality.[41] Given that the EV Portfolio described herein represents a coordinated approach to making targeted investments in the EV infrastructure market in a manner that will facilitate an efficient and reliable electric distribution grid moving forward – especially given the State's goals of deploying 300,000 zero-emission vehicles by 2025 and reducing greenhouse gas emissions 40% by 2030, including from the transportation sector – the Commission is authorized to proceed in this endeavor.

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[37] 2011 Md. Laws, Ch. 403, Section 2-1.
[38] Further, there was no sunset date specified in the legislation, and the remaining uncodified language directed the Commission to promptly consider and act upon each proposal for a pilot program received pursuant to PUA § 7-211. 2011 Md. Laws, Ch. 403, Section 2-2.
[39] *People's Counsel v. Public Service Commission*, 52 Md. App. 715, 722 (1982).
[40] PUA § 2-112(c).
[41] PUA § 2-113(a)(2).

III. Summary of Applicable EV Research and Analyses

A. Maryland-Specific EV Infrastructure Gap Analysis

The National Renewable Energy Laboratory ("NREL"), in collaboration with the California Energy Commission, developed the Electric Vehicle Infrastructure Projection Tool ("EVI-Pro") as a method by which to estimate regional requirements for charging infrastructure to support consumer adoption of light-duty plug-in EVs.[42] Using data derived from EV market projections and real-world travel data from mass market consumers to simulate spatially and temporally resolved demand, the EVI-Pro tool is capable of estimating future requirements for home, workplace, and public charging infrastructure.[43] In this manner, the EVI-Pro tool is able to assist stakeholders with identifying the projected "gap" between existing EVSE infrastructure and the types and quantities of EVSE infrastructure needed to support a specified EV adoption goal. Indeed, several state and local entities have engaged with NREL to conduct case studies using the EVI-Pro tool to yield gap analyses specific to their jurisdictions.[44] Thus, NREL was engaged to produce a similar case study specific to Maryland, in support of the State's ZEV MOU goal of 300,000 electric vehicles deployed by 2025.[45]

The fundamental assumption on which the EVI-Pro tool relies is that consumers prefer charging scenarios that enable them to complete all their existing travel with maximum electric

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[42] Wood, Eric et al. *National Plug-in Electric Vehicle Infrastructure Analysis*, NREL/U.S. DOE (Sept. 2017) at 12, *available at:* https://www.nrel.gov/docs/fy17osti/69031.pdf.

[43] *Id.*

[44] *See, e.g.* Wood, Eric et al. *Regional Charging Infrastructure for Plug-in Electric Vehicles: A Case Study of Massachusetts*, NREL (Jan. 2017), *available at:* https://www.nrel.gov/docs/fy17osti/67436.pdf. The NREL EVI-Pro tool has also been used to generate charging infrastructure deployment estimates for Columbus, Ohio; the Texas Triangle; the State of California; and Seattle, Washington. *See*, Zhou, Yan *Modeling and Analysis of Plug-In Electric Vehicle Charging Infrastructure Supporting Mobility*, U.S. DOE (June 8, 2017), https://energy.gov/sites/prod/files/2017/06/f35/eems012_smart_2017_o.pdf.

[45] At the Commission's direction, NREL was identified as the "appropriate entity…to conduct the EV charging infrastructure gap analysis" and subsequently engaged using a portion – not to exceed $150,000 – of the grid modernization money set-aside by the Commission pursuant to Order No. 88128. ML#217262: *Case No. 9361, Order No. 88128 – Expenditure of Most Favored Nation's Funding to Support Public Conference 44 Electric Vehicles Work Group Activities* (Oct. 6, 2017).

vehicle miles travelled ("eVMT") and minimum operating costs.[46] The methodology employed by the EVI-Pro tool, including the variable inputs and subsequent outputs, was presented at length to the PC44 EV Work Group by representatives from NREL on September 20, 2017.[47] Subsequently, a central scenario was developed in consideration of three main variables: EV counts by type (PHEV or BEV) and range; level of support for PHEVs; and the percent of EV owners that lack access to at-home charging solutions.

With respect to the first variable, the Maryland-specific gap analysis relied on existing EV registrations in the State, segmented by EV and residence type, and applied historic growth factors and nationwide estimates for 2025 PHEV versus BEV ratios (50:50) to determine a projected breakdown of the EVs registered in each service territory assuming a demand based on 300,000 EVs registered statewide. Second, the central scenario assumed a "middle-of-the-road" approach to the level of support provided to PHEVs; in other words, it is assumed that local attitudes toward enabling PHEV owners to maximize eVMT are moderate or neutral. Third, using the 2016 American Community Survey on household ownership and residence type, assumptions were derived for the percentage availability of at-home charging solutions in each service territory, assuming that renters and individuals in large complexes will have a limited ability to park and charge their vehicle in a consistent location. Finally, the EVSE to EV ratios developed by NREL in its nationwide study were applied to the central scenario of the Maryland-specific gap analysis, all of which collectively yielded the following preliminary results:

[46] Wood, Eric et al. *National Plug-in Electric Vehicle Infrastructure Analysis*, NREL/U.S. DOE (Sept. 2017) at 12, *available at:* https://www.nrel.gov/docs/fy17osti/69031.pdf.
[47] A detailed description of EVI-Pro's functionality is also publicly available by accessing the Methodology Section of the case study completed for Massachusetts, *available at:* https://www.nrel.gov/docs/fy17osti/67436.pdf.

Table: Preliminary Results of Maryland-Specific Gap Analysis, Central Scenario[48]

Utility Service Territory	2025 PEVs	% w/ home charging	PHEV20	PHEV50	BEV100	BEV250	Work L2 Plugs	Public L2 Plugs	Public DCFC Plugs
BGE	143,090	70%	42,927	28,618	21,464	50,082	9,495	4,318	503
Pepco	97,613	64%	29,284	19,523	14,642	34,165	7,207	3,278	392
PE	23,724	80%	7,117	4,745	3,559	8,304	1,269	577	63
SMECO	18,598	87%	5,579	3,720	2,790	6,509	841	382	39
Delmarva	11,947	83%	3,584	2,389	1,792	4,182	601	273	29
Remaining MD Utilities	5,027	88%	1,508	1,005	754	1,759	220	100	10
State Total	**300,000**	**70%**	**90,000**	**60,000**	**45,000**	**105,000**	**19,632**	**8,928**	**1,036**

The above described gap analysis constitutes a central scenario, and variations thereto may be produced through sensitivity analyses. Because the EV Portfolio proposed herein targets only a limited portion of the projected gap in charging infrastructure, the Signatory Parties do not contemplate revising the Proposal based on sensitivity analyses at this time; although such sensitivity analyses are indeed underway. Additional information will also be made available with respect to granular siting prospects for the charging infrastructure needs identified in the central scenario, based on spatial demand analyses. While the Utilities' programs proposed as part of the EV Portfolio generally rely on customer-driven applications for siting purposes, consideration of the siting guidance provided by the NREL study may inform the Utilities' implementation guidelines and subsequent approval of workplace and public charging infrastructure incentive requests.

Because of the detailed and thorough nature of the EVI-Pro Maryland-specific case study, the report authored by NREL, which will describe more fully the central scenario results and sensitivity analyses, will be filed in this proceeding at a later date. The necessary information regarding assumptions and methodology used by the EVI-Pro tool, however, are

[48] The table header "PHEV20" refers to a generic plug-in hybrid electric vehicle model with an electric range of 20 miles; "PHEV50" refers to a PHEV model with an electric range of 50 miles; "BEV100" refers to a battery electric vehicle model with an electric range of 100 miles; and "BEV250" refers to a BEV model with an electric range of 250 miles.

provided herein and through other publicly-available studies already completed. The Signatory Parties currently anticipate filing the completed NREL Maryland-specific case study no later than March 2, 2018, so that other parties to the proceeding may reference the document in Reply Comments.

B. Maryland-Specific EV Cost Benefit Analysis

In December, 2016, M.J. Bradley & Associates ("MJB&A") completed a study, on behalf of the National Resources Defense Council ("NRDC"), intended to provide input to state policy discussions regarding potential actions undertaken in furtherance of state EV adoption goals.[49] The study estimates the costs and benefits of increased EV penetration levels in Maryland, using two different penetration levels; scenario 1 ("ZEV MOU") is derived from EV adoption rates consistent with the State's short-term ZEV MOU goal of 300,000 EVs deployed by 2025, and scenario 2 ("80 x 50") is derived from the State's long-term goals for economy-wide GHG reductions of 80% from 2006 levels by 2050.[50] By comparing the two scenarios to a business-as-usual baseline of continued gasoline car use, the study estimated total reductions in GHG emissions that could be achieved by transitioning the light duty fleet over to EVs, and then quantified the value of these GHG reductions to society.[51] The study also estimated the benefits that would accrue to all electric utility customers in Maryland as a result of increased utility revenues from EV charging, which could then be used to support operation and maintenance costs for existing distribution infrastructure and offset future electricity rate increases.[52] Additional benefits were estimated by the study related to the provision of price signals or

[49] Lowell, Dana et al. *Electric Vehicle Cost-Benefit Analysis, Plug-in Electric Vehicle Cost-Benefit Analysis: Maryland*, MJB&A (Dec. 2016).
[50] *Id*. at 4.
[51] *Id*.
[52] *Id*.

incentives designed to encourage off-peak charging, as well as the annual financial benefits that would be realized by individual Maryland EV owners from fuel and maintenance cost savings compared to owning a gasoline vehicle.[53]

In summary, the benefits of increased EV penetration in Maryland are projected to accrue to: plug-in EV owners directly in the form of reduced annual vehicle operating costs; electric utility customers in the form of reduced electric bills; and society at large as the value of reduced GHG emissions. The MJB&A Maryland-specific cost-benefit analysis concluded that the following benefits would be realized under the 80 x 50 scenario in 2030 and 2050, on a dollar per plug-in EV basis:

Table: Summary of Statewide Annual Benefits (Net Present Value)[54]

NPV Annual Benefits ($ / PEV)		
	2030	**2050**
PEV Owner	$ 94	$ 338
Utility Customer	$ 80	$ 58
GHG Reduction	$ 61	$ 124
Total	$ 230	$ 515

C. Other Research

In addition to the aforementioned Maryland-specific analyses, extensive research has been conducted by various entities in an effort to provide guidance to utility regulators seeking to address the emerging issues surrounding the intersection of energy and transportation sectors. A discussion paper authored by the Georgetown Climate Center proved particularly adept at succinctly presenting the sequential questions for policymakers to consider in approaching

[53] *Id.*
[54] D. Lowell et al. *MJB&A Analyzes State-Wide Costs and Benefits of Plug-in Vehicles in Five Northeast and Mid-Atlantic States* (Feb. 14, 2017), http://www.mjbradley.com/reports/mjba-analyzes-state-wide-costs-and-benefits-plug-vehicles-five-northeast-and-mid-atlantic.

regulation related to EVs.[55] *First*, GCC suggests that policymakers define the goals they are trying to achieve,[56] just as has been done in the Maryland context and described at length in Section I of this Proposal. After providing an overview of EV charging technologies and potential charging locations, the GCC discussion paper next suggests that policymakers consider options for the potential structure of an EV charging market, including addressing where on the spectrum of EVSE ownership the State will fall (*i.e.* monopoly versus competitive markets, and many iterations in between).[57] The GCC discussion paper also encourages policymakers to tackle questions regarding the pricing for EV charging at different locations, as well as the appropriate distribution of costs.[58] Finally, several recommendations for policymakers are outlined by GCC, including a suggestion that regulators strive to make the policy process as transparent and collaborative as possible.[59]

A second paper co-authored by GCC and MJB&A further explores the topic, focusing more directly on key considerations for regulators addressing the question of utility investment in EV charging infrastructure.[60] As described in the GCC/MJB&A paper, utility involvement in charging infrastructure development can yield numerous benefits, not the least of which include increasing the pace and scale of infrastructure development by opening the market to utility capital, expertise, and other resources.[61] Other potential benefits of utility involvement include maintaining reliability and minimizing grid impacts; lowering the cost of infrastructure development; capitalizing on existing customer communication channels and relationships; and

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[55] Zyla, Kathryn A. *Discussion Paper: Charging Ahead – Options for Policymakers Regarding the Regulation of Electric Vehicle Charging Markets* (June 2014).
[56] *Id.* at 1.
[57] *Id.* at 6 – 7.
[58] *Id.* at 9 -13.
[59] *Id.* at 14.
[60] Allen, Paul & Matthew Goetz, et al. *Utility Investment in Electric Vehicle Charging Infrastructure: Key Regulatory Considerations,* MJB&A / GCC (Nov. 2017).
[61] *Id.* at 8.

providing more equitable access to charging infrastructure.[62] While the GCC/MJB&A paper explores and emphasizes the aforementioned potential benefits of utility involvement, it does so in the context of the regulators' need to balance the identified benefits against other potential risks and concerns, such as the need to maintain competitive access to charging infrastructure and to protect ratepayers against significant stranded costs.[63] Overall, the GCC/MJB&A recommends six key considerations for regulators addressing requests to invest ratepayer funds in charging infrastructure: (1) how much charging infrastructure is needed to support the anticipated level of PEV penetration; (2) what transmission and distribution system upgrades and investments will be needed to accommodate electric vehicles; (3) how can regulators help ensure equitable access to charging infrastructure; (4) how should the costs and benefits of utility investment in charging infrastructure be assessed; (5) how can programs be designed to maximize the benefits; and (6) how should utilities recover the costs of infrastructure investment.[64]

Other research has been conducted recently to evaluate the potential role of utilities in the EV infrastructure arena. A 2016 Report authored by the Vermont Energy Investment Corporation ("VEIC") focused on the mechanisms by which utilities can help realize the benefits of EVs throughout the Northeast.[65] Through its Report, VEIC concludes that due to the comparatively clean electric grid in the Northeast, particularly in those states participating in the Regional Greenhouse Gas Initiative, the electrification of the transportation sector will produce significant climate and environmental gains.[66] In addition, the Report asserts that significant

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[62] *Id*.
[63] *Id*.
[64] *Id*. at 11 – 19.
[65] Malmgren, Ingrid et al. *Fully Charged: How Utilities Can Help Realize Benefits of Electric Vehicles in the Northeast*, VEIC (Sept. 7, 2016).
[66] *Id*. at 2 – 5.

economic development benefits could be realized through the electrification of the vehicle fleet, with a full switch to light-duty EVs facilitating an approximate $7 billion flowing back into the regional (New York and New England) economy each year due to savings on gasoline.[67] Further, the Report concludes that it is critical for Northeast states to proactively engage utilities so that an acceleration of EV deployment can occur, particularly in a manner designed to facilitate the integration of EV load onto the grid.[68] VEIC reiterates that with proper incentives for timely charging, EVs can benefit the electric grid through load management, lower electric rates, and assistance with the integration of renewables.[69]

[67] *Id*. at 5.
[68] *Id*. at 2.
[69] *Id*.

IV. Role of the Competitive Market

In its January 31, 2017 PC44 Notice, the Commission stated as a guiding principle that "[c]ompetitive markets are an integral part of Maryland's electricity landscape that seek to promote innovation, reduce costs, and increase customers' choices."[70] The Signatory Parties recognize that competitive markets exist today for EV charging – both equipment and networks – and the statewide EV Portfolio is designed with this in mind. Indeed, the input and feedback received from private market participants whom engaged in the PC44 Work Group was influential in developing the instant Proposal.[71]

While the goal is for a robust EV infrastructure competitive market to flourish in the long-term, even stakeholders currently active in the private market acknowledge that a well-designed investment strategy facilitated by electric utilities is beneficial, and perhaps even necessary to achieve infrastructure installation rates at the pace required to support state-specific EV adoption goals. This sentiment was first solidified in Maryland during the Commission's July, 2016 Public Conference 43 proceeding, and again echoed through the Commission's PC44 Notice signaling that a potential action to be considered might be, "[p]lanning a limited utility infrastructure investment in EVSE, working with private industry and identifying locations at which it is difficult to attract private capital for EVSE investment."[72] Although reasonable minds may disagree in the interpretation of what constitutes a "limited" utility-facilitated investment, the Signatory Parties construed the Commission's guidance as both a temporal and a size limitation – in that the Proposal targets investments occurring over the next five years and in

[70] ML#212176: *Public Service Commission of Maryland Public Conference 44 Notice* (Jan. 31, 2017) at 3.
[71] Examples of adjustments made to the Utilities' proposals upon consultation with private market participants, as well as others, are delineated in Attachment B.
[72] ML#212176: *Public Service Commission of Maryland Public Conference 44 Notice* (Jan. 31, 2017) at 9.

an amount well under a third of the projected gap in public/workplace EV charging infrastructure needed to support the State's 2025 ZEV MOU goals.

Indeed, the accelerated near-term deployment of EVSE and supporting rate design options contemplated by this Proposal constitute a coordinated statewide approach to laying the foundation for a sustained competitive market in the long-term driven by private investments. While there are variabilities in the individual program offerings between service territories (meant to capture the realities of differing demographics), all components are designed with the aforementioned goal in mind. The Utilities are committed to facilitating the prudent investment of ratepayer dollars approved as part of the EV Portfolio, and will do so in the context of the Commission principle that competitive markets are integral to the State's electricity landscape.

As such, the Signatory Parties propose to establish an EV Portfolio Advisory Council that will provide, among other things, feedback related to the deployment of the EV Portfolio as it intersects with the existing competitive markets. In particular, the Council will study the pricing of charging services from utility-owned non-residential stations as it relates to the pricing of charging services made available by the competitive market and third-party EV charging providers in non-residential applications. By January 1, 2023, the Council will produce a study of the different pricing options provided to drivers at non-residential charging stations, and the potential impacts of utility charging service pricing to the competitive market.[73] To the extent that the study produces actionable next steps, the Council will provide implementation guidance to the Commission. Consideration of such study does not preclude or inhibit the ability to deploy programs as proposed by the Utilities and approved by the Commission. Comments thereto will be provided by the Council to the Utilities on a rolling basis during the active

[73] If approved, the Signatory Parties suggest that funding for such a study, in the amount of $25,000, could be sourced from funding set-aside to further the Commission's grid modernization efforts.

deployment stage of the EV Portfolio, and will be summarized in semi-annual reports to the Commission.[74] While the feedback will likely take the form of implementation guidance, the Council may track and report on several related variables, such as the number of EVSE providers active in the State.[75]

[74] More information regarding the proposed EV Portfolio Program Implementation Strategy, including reports filed with the Commission, is contained in Section VI of this Proposal.

[75] According to EVIC's most recent Annual Report, there are at least 7 EVSE providers active in Maryland currently. Maryland Dept. of Transp., *Electric Vehicle Infrastructure Council Annual Report* (Dec. 2017), at 10, *available at:* http://www.mdot.maryland.gov/newMDOT/Planning/Electric_Vehicle/Documents/EVIC_2017_Annual_Report_Final_12-31-2017.pdf.

V. Benefits of the Proposed EV Portfolio

In addition to contributing to Maryland's healthy air quality goals, the statewide EV Portfolio offers a variety of benefits. Among other benefits, the State of Maryland will receive tax benefits associated with additional franchise tax revenues on the incremental EV usage, as well as additional property tax revenues on utility-owned EV charging network assets. Some of the projected incremental benefits associated with the Utilities' program offerings are as follows:

Benefits		BGE	PHI	PE
Residential Incentives	Promote the adoption of EVs both by creating an opportunity for obtaining a smart charger and through increased education related to EV and charging benefits.	✓	✓	✓
	Help overcome initial price barriers for installing EV chargers with "smart" capabilities.	✓	✓	✓
	Bring advanced capabilities to installed EV charger stations, enabling EV customers to understand and manage the charging load and grid impact.	✓	✓	✓
	Provide additional information related to EV charging behavior at residential service locations to allow for future time-of-use, managed charging, or other EV rate offerings.	✓	✓	✓
	See and understand EV charging behavior, and manage timing of EV charging by taking advantage of established whole-house EV TOU rates.	✓	✓	
	Enable customers to participate in load response programs.	✓	✓	
	Pilots an off-peak charging incentive not tied to a rate structure, to engage customers with pre-existing non-smart charging equipment		✓	
	Provides the utility insight into impact on customer usage patterns and responses to different incentives through an EV-only TOU rate.		✓	

Benefits		BGE	PHI	PE
Multifamily Incentives	Incentives help increase interest and investment in hard-to-reach EV charging applications such as multi-unit dwellings ("MUDs") that also include "smart" capabilities in the EV chargers to provide customers with detailed use information, and ability to manage charge and enhanced use measurement capabilities.	✓	✓	✓
	Help overcome barriers to charging in MUD applications.	✓	✓	✓
	Provide additional information related to EV charging behavior at multifamily service locations to allow for future time-of-use, managed charging, or other EV rate offerings	✓	✓	✓
	Provide targeted charging access to low-income customers in multi-unit dwellings.			✓
Non-Residential Incentives	Incentives help increase interest and investment in hard-to-reach EV charging applications such as workplace and fleet charging installations that also include "smart" capabilities in the EV chargers to provide customers with detailed use information, and ability to manage charge and enhanced use measurement capabilities.	✓	✓	✓
	Help overcome barriers to charging at commercial and industrial service locations.	✓	✓	✓
	Encourage workplace and fleet charging consideration that in turn encourages EV adoption, while enabling customers to manage the charging load.	✓	✓	✓
	Engage customers with workplace and/or fleet charging to incorporate the chargers into their facility load management.	✓		✓
Public Charging Incentives	Ease concerns (e.g. range anxiety) of EV users and potential EV adopters by making EV charging more readily available in public settings.	✓	✓	✓
	Help overcome barriers to charging at public service locations.	✓	✓	✓
	Provide additional information related to EV charging behavior at public service locations to allow for future time-of-use, managed charging, or other EV rate offerings.	✓	✓	✓

Benefits		BGE	PHI	PE
Technology Demonstration	Evaluate the grid impacts of the demonstration project to determine the benefits of pairing storage technology with a DC Fast charger.		✓	✓
	Gain a better understanding of how multiple use cases can be merged in order to maximize the economic and technical benefits of EV Charging Infrastructure.		✓	
Innovation Incentives	Supports the development of creative concepts that bring the benefits of electric transportation to broader segments, including public transit-dependent communities.	✓	✓	

A. BGE Cost Benefit Analysis

All ratepayers can benefit from implementation of BGE's EV Charging Proposal. BGE has looked at the potential impact on distribution rates from added EV charging load as compared to the estimated costs to ratepayers from implementation of the Proposal. BGE concludes that if EV use in Maryland grows to meet the State targets for 2025, the added distribution revenues[76] from the EV charging use among BGE's customers will exceed the estimated EV Charging Proposal residential revenue requirements by approximately 2.0 times overall through the ZEV Mandate years. Additionally, if electric vehicle growth in Maryland continues at the projected rate, then the additional charging use could contribute as much as 4.3 times more distribution revenue than the Proposal's residential revenue requirements, through the life of the program.

[76] Analysis based on BGE residential distribution rate as proposed to the PSC on January 5, 2018. Proposed rates are lower than current January 2018 distribution rates in effect.

Table: BGE Cost Benefit Analysis Results[77]

Summary of Revenue Requirements Analysis - With Utility Owned Network											
Residential Revenue Requirements - EV Charging Proposal	**Eff. July 2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
5 Year Rebate and Program Cost Amortization	$ 223,518	$ 795,923	$1,623,279	$2,710,287	$ 4,022,414	$ 4,466,087	$ 3,924,914	$ 3,282,981	$ 2,322,101	$ 1,369,686	$ 891,064
Incremental Distribution Revenues - EV Usage Forecast	**Eff. July 2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Incremental EV Usage Forecast	$ 208,811	$1,104,945	$2,050,566	$3,405,750	$ 5,173,642	$ 7,366,626	$10,145,500	$ 13,477,337	$ 17,463,670	$ 22,152,854	$ 27,602,584
Net Revenue Requirements (EV Charging Proposal - EV Usage)	**Eff. July 2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
5 Year Rebate and Program Cost Amortization	$ 14,706	$ (309,021)	$ (427,287)	$ (695,463)	$(1,151,227)	$(2,900,539)	$ (6,220,585)	$ (10,194,356)	$ (15,141,569)	$ (20,783,168)	$ (26,711,520)
Ratios - EV Usage Impact ($) / EV Charging Proposal ($)											
5 Year Rebate and Program Cost Amortization	0.93	1.39	1.26	1.26	1.29	1.65	2.58	4.11	7.52	16.17	30.98
ZEV Timeline Ratio (2018-2025)	**2.0**										
Total Program Ratio (2018-2028)	**4.3**										

B. PHI Cost Benefit Analysis

PHI expects that ratepayers may benefit from implementation of its EV Charging Proposal. PHI evaluated for an eight year period (2018 - 2025) the potential impact on residential distribution revenues from added EV charging load as compared to the estimated incremental revenue requirements to residential ratepayers from implementation of the Proposal. PHI concludes that, for the period in question, if EV use in its territory through 2025 matches estimates provided by NREL, the added distribution revenues from the EV charging use among its residential customers will exceed the estimated EV Charging Proposal residential revenue requirements by approximately 3 times for Pepco Maryland and by more than 1 time for Delmarva Power and Light Maryland.

[77] Analysis based on BGE residential distribution rate as proposed to the PSC on January 5, 2018. Proposed rates are lower than current January 2018 distribution rates in effect.

C. PE Cost Benefit Analysis

Based on PE's preliminary cost benefit analysis, PE predicts that all customers can benefit from this Proposal.

PE is proposing to recover the costs associated with this Proposal through a surcharge rider. PE will offset this surcharge rider with revenues that exceed the standard retail tariff charge for each separately-metered charging service location, which constitute at least half of the non-residential program. At the separately-metered charging service locations, 130 chargers will offer an EV rate of either $0.15/kWh plus $2.00 per charge at Level 2 chargers or $0.19/kWh plus $3.00 per charge at DC Fast chargers.

Assuming an EV adoption rate that achieves the goal of 300,000 EVs in Maryland by 2025, PE projects that approximately 5,000 EVs will be introduced to its service territory each year. By 2028, PE projects that there will be approximately 40,000 EVs in its service territory. The charging profile for EV drivers currently assumes that 80% of charging occurs at home and 20% of charging occurs at public or commercial locations. It is reasonable to assume that EV drivers use approximately 4,000 kWh per year to charge their vehicles.

By 2028 (if not sooner), PE projects that the total costs collected through the surcharge rider during the program should be outweighed by the total revenues that flow back to customers. The revenues to customers should still outweigh the costs where 50% of public or commercial charging at non-PE charging service locations is assumed.

VI. Proposed EV Portfolio Program Implementation Strategy

The EV Portfolio described in this filing is proposed as a coordinated statewide approach, insofar as the initiatives and pilots are collectively designed to pursue the same overarching policy objective: incentivize the deployment of EVSEs in furtherance of Maryland's aforementioned stated public policy goals and commitments in a manner that will increase the efficiency and reliability of the electric distribution system.[78] Further, as described in subsequent sections, the Utilities commit to pursuing similar communication strategies with respect to the planned customer education and outreach campaigns, as well as a joint procurement and protocol for the Evaluation, Measurement, and Verification of the EV Portfolio in its entirety.

The individual program components, of which the EV Portfolio is comprised, however, represent various approaches to engaging potential residential and non-residential participants, as well as under-served or under-capitalized markets. The proposed variability in these approaches is consistent with other large-scale deployments undertaken in first-mover states such as California, and recognizes that the demographics in individual Maryland service territories may respond differently to different EVSE ownership and incentive models. To that end, the lessons learned during the implementation phase of the EV Portfolio, as well as the underlying key data collected as part of these efforts, will be made publicly available at defined intervals during and following completion of the programs (subject to the appropriate aggregation and anonymization policies employed by the Utilities to protect personally-identifiable information). The following evaluation schedule is proposed with respect to the EV Portfolio:

[78] PUA § 7-211(m)(3)(i).

- Individual utility programs are designed to roll-out over a roughly five year period, assuming a program launch date of July, 2018. Some programs, especially those offered by PE and infrastructure-based program elements offered by the other utilities, may require the remainder of calendar year 2018 to ramp-up. The program offerings proposed by BGE, Delmarva, and Pepco are designed to conclude by December 31, 2022, unless modified or affirmatively extended by the Commission. PE's program offerings are designed to conclude by December 31, 2023, unless modified or affirmatively extended by the Commission.
- During the "active deployment" stage, semi-annual reports will be filed with the Commission by February 1st (covering data for the third and fourth quarters of the prior calendar year, as well as program-to-date) and August 1st (covering data for the first and second quarters of the corresponding calendar year, as well as program-to-date). While the reports will be placed on an Administrative Meeting agenda for comment by interested parties, unless requested by Technical Staff, the Commission will not hold a separately-noticed legislative-style hearing in conjunction with these filings, subject to the exception noted below with respect to the Mid-Course and Final Reviews.
- Mid-course review: In October/November 2020, the Commission will convene a legislative-style hearing to review the progress to-date of the statewide EV Portfolio. Utility progress reports and accompanying interim evaluations will be based on data collected through June 30, 2020 and will be filed in the docket by September 15, 2020.
- Final Review: In May 2023, the Commission will convene a legislative-style hearing to review the performance of the statewide EV Portfolio. Utility reports and accompanying evaluations will be based on data collected through December 31, 2022 and will be filed in the docket by March 1, 2023.[79]
    - The utility reports may also include, as appropriate, requests to expand successful offerings or to transition certain pilot offerings into permanent programs. The Commission would issue final decisions by June 30, 2023 regarding any extension/expansion requests proposed by a utility.
    - Customers enrolled in a pilot program or rate offering may continue in that posture pending a final Commission decision (*i.e.* June 30, 2023). If the applicable offering is not affirmatively extended or expanded by the Commission, then customers will be transitioned to SOS or competitive service, as appropriate.

Because the proposed EV Portfolio is in many respects a ground-breaking proposal, especially in the Mid-Atlantic region, the Signatory Parties respectfully request that the Utilities be allotted a certain degree of flexibility in regard to the management of the proposed budgets so that the approved use of ratepayer dollars may be targeted in the most productive and efficient

[79] Although the programs proposed by PE will not conclude until December 31, *2023*, PE will still participate in the Mid-Course and Final Review hearings as described. A year later (*i.e.* March 1, 2024), however, PE will submit to the Commission a supplemental report to address program activities concluded in calendar year 2023.

manner possible as market conditions fluctuate. Many of these requested flexibility mechanisms are derived explicitly from policies approved by the Commission in the context of the Utilities' implementation of their EmPOWER Maryland portfolios,[80] all of which were supported by Staff in that context. Specifically, the implementation flexibilities requested in support of the efficient implementation of the EV Portfolio include the ability of the applicable utility to: (1) shift pre-approved incentive dollars between programs within the same sub-portfolio;[81] (2) describe the proposed incentives as representative of "up to $X" amounts; (3) spend the pre-approved incentive dollars at any point during the defined program cycle period; and (4) increase the incentive amounts included in the proposal by a maximum of 15% without further Commission approval. With respect to each of the aforementioned flexibility mechanisms, the overall sub-portfolio budgets authorized by the Commission would remain binding, unless affirmatively modified by subsequent Commission order, and would be subject to the provision of appropriate advance notice (10 business days) to Staff. Further, while the Utilities would strive to meet the timing and measure targets described in this Proposal, individual measures will be definitively tracked and included in the semi-annual reports.

Additionally, EVSE technology and market developments may cause the Utilities, other Signatory Parties, or interested stakeholders to propose modifications to approved programs, or new and innovative offerings, at a future date. Thus, this Proposal respectfully reserves this option, which would be exercised judiciously.

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[80] *See* Order No. 88514 (Dec. 22, 2017) at 8 – 10.

[81] "Sub-portfolio" is the term used to describe a classification system for individual utility programs according to similar applications and end-users, and is designed to ensure that no inter-class cross-subsidization would occur in the event that the flexibility mechanisms requested herein are employed. The sub-portfolio designation assigned to individual utility programs is delineated in the templates included in Attachments C – G. Examples of sub-portfolio designations include residential, non-residential, and public.

Lastly, the Signatory Parties commend the collaborative stakeholder process that was undertaken by the PC44 EV Work Group, and thus propose to formalize a role for such a body moving forward should the Proposal be approved by the Commission. As previewed in Section IV of this Proposal, the Signatory Parties suggest establishing an EV Portfolio Advisory Council, comprised of, at a minimum, the Signatory Parties, OPC, and Technical Staff. The Council will convene in-person at least quarterly and by teleconference on an *ad hoc* basis to provide implementation guidance and feedback to the Utilities regarding the implementation of the EV Portfolio.[82] As described in Section XII, the EV Portfolio Advisory Council will also house a stakeholder work group to provide input on planned next steps related to the EV Portfolio, as well as a Communications Advisory Board as more fully articulated in Section VIII.

[82] The chair of the EV Portfolio Advisory Council will rotate on an annual basis among the Signatory Parties. The Chair will be responsible for convening meetings, and for providing a summary report of the group's activities to the Commission in conjunction with the semi-annual review timeline specified herein.

VII. Proposed EV Portfolio Evaluation, Measurement, and Verification Strategy

Determining and validating the impacts of the EV Portfolio represents a critical component of this Proposal, and one which the Utilities are committed to conducting in a transparent and public manner. To that end, the Proposal contemplates a joint procurement across the participating Utilities to secure an independent, third-party Evaluation, Measurement, and Verification ("EM&V") contractor, consistent with nationwide best practices. A request for proposals will be issued to secure the Utilities' joint EM&V contractor, and a vendor will be selected based on demonstrable industry expertise and recognized credentials with respect to this subject matter, and at the lowest cost possible using the aforementioned criteria. The Utilities commit to providing the independent EM&V contractor with unfettered access to EV Portfolio-related data and expenditures, and will subsequently file the resulting EM&V reports[83] in the Commission's established EV Portfolio public docket.

To provide an idea of the breadth and depth of analysis that the Commission may reasonably expect, the Signatory Parties submit for your consideration the Final Report prepared by the Electric Power Research Institute ("EPRI") regarding the results, insights, and analysis of customer metrics for the Pepco Demand Management Pilot for Plug-In Vehicle Charging in Maryland issued in April, 2016.[84] The EPRI Report analyzed key metrics divided into four areas: customer behavior; customer costs; utility costs; and demand response.[85] Metered data from the affected EV customers, supplemented by customer surveys conducted upon enrollment

[83] Because PE is proposing a slightly different implementation timeline (Jan. 2019 – Dec. 2023) compared to the other three Utilities (July 2018 – Dec. 2022), the EM&V contractor will be required to file an updated analysis following completion of the PE programs on April 1, 2024; although, PE's progress-to-date will be evaluated and reflected in the EM&V contractor's report due April 1, 2023, which will otherwise reflect the EV Portfolio's results through the end of the program cycle on December 31, 2022.
[84] ML#189769: *Final Report – Results, Insights, and Customer Metrics*, EPRI (April, 2016).
[85] *Id*. at viii.

and one year into the pilot, were relied on by EPRI in its analysis.[86] Additionally, EPRI offered several insights as part of its Report regarding a potential path forward, many of which have been instrumental in the development of the instant Proposal (and will continue to be so during Phase Two of this Work Group, as discussed in a subsequent section).[87]

While the evaluation methodology of the EV Portfolio may vary from the EPRI / Pepco Pilot Report example discussed above (depending on the competitively-bid EM&V contractor selection), the metrics by which the EV Portfolio as a whole, as well as the individual programs of which it is comprised, will be evaluated are known variables, and proposed herein for the Commission's consideration. Taken as a whole, the EV Portfolio will be evaluated as to whether it has incentivized deployment of EVSEs in a manner that will increase the efficiency and reliability of the electric distribution system[88] in the context of realizing Maryland's stated public policy goals and commitments. This is especially the case as it relates to the realization of the 8-state MOU target of 300,000 zero emission vehicles deployed in Maryland by 2025, as well as the State's reliance on the electrification of the transportation sector as a technology-based mitigation strategy to achieve its GGRA goal of a 40% reduction in GHG emissions by 2030.

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[86] *Id.*

[87] For example, the EPRI Report confirmed that shifting charging times to off-peak hours saves costs due to avoided or delayed infrastructure upgrades, and that the simple act of planning a demand response event incentivizes customers to alter their charging behaviors. *Id.* at 10-1. Thus, programs within the EV Portfolio have been designed to lay the groundwork for smart charging and advanced load management throughout the State, as well as several immediate off-peak charging rebate and rate design program offerings.

[88] PUA § 7-211(m)(3)(i).

Overall EV Portfolio Metrics

The following metrics will be tracked universally and shared publicly across the EV Portfolio; however, additional and more detailed metrics for the individual programs proposed by the Utilities will exceed the following non-exhaustive list and are instead detailed in the templates included in Attachments C – G.

1. EVSE installation costs by site type (broken out by distribution system costs, "behind-the-meter" make-ready costs up to the stub, and charging station costs);[89]
2. Where applicable, operations and maintenance costs incurred by the utility;
3. For utility-owned/operated EVSEs:
    a. The usage rate by site type and charger type;
    b. The charging load profiles (both aggregate and by site type); and
    c. The price per kWh and usage in kWh by price charged to EV drivers.
4. For non-residential EVSEs operated by a non-utility site host that have received a rebate through this Proposal, the parties agree to provide the following data as a condition of receiving the incentive:
    a. The usage rate by site type and charger type;
    b. The charging load profiles (both aggregate and by site type); and
    c. The site host's pricing plan applicable to EV drivers, updated on a quarterly basis;[90] and
5. Estimated avoided air emissions resulting from the programs.[91]

[89] For EVSE installation costs borne by a non-utility site host, the Utilities will require (through the application process) that such information be provided as a condition of receiving an incentive made available through the EV Portfolio.

[90] As a condition of receiving an incentive made available through the EV Portfolio, the non-utility site host will agree to provide the utility, within 30 days of the non-residential charging station becoming operational, a copy of its initial intended pricing plan for end-users. The utility is not required to approve the pricing plan, but rather will collect the data as a programmatic metric.

[91] The EV Portfolio Advisory Council will consult with MDE and MDOT to identify the methodology and assumptions relied on by those agencies for EV-related measures captured in the GGRA Plan. The Utilities, within 60 days of receiving Commission approval, will file notice with the Commission regarding the proposed methodology developed by the EV Portfolio Advisory Council in consultation with MDE and MDOT, which will be used by the Utilities and verified by the EM&V contractor to estimate avoided air emissions resulting from the EV Portfolio.

VIII. Proposed EV Portfolio Customer Education and Outreach Strategy

An equally critical component of the EV Portfolio is the planned customer education and outreach strategy, wherein the Utilities propose to devote approximately 5% of the planned total programmatic costs in support of such endeavors. Specifically, the Utilities propose to embark on a comprehensive customer education and outreach campaign geared towards enhancing customers' and the public's awareness of EV technology and the availability of EV charging throughout their respective service territories. The campaign would utilize a variety of communication channels to impact awareness on both a local and regional basis, and would seek to leverage supporting regional collaborative efforts and private-public partnerships wherever possible in an effort to maximize non-ratepayer funding streams.

While the Utilities would retain the ability to differentiate customer education and outreach materials in recognition of the variety of offerings included in the EV Portfolio, messaging strategies and content will be previewed and shared with a newly-formed body entitled the EV Portfolio Communications Advisory Board, which will fall under the governance structure of the EV Portfolio Advisory Council first described in Section IV of this Proposal. The Communications Advisory Board will meet quarterly for the duration of the program cycle, and will be comprised of, at a minimum, representatives from the Signatory Parties, Staff, and OPC.[92]

[92] The opportunity to participate on the Board will also be proactively extended to members of the Electric Vehicle Infrastructure Council ("EVIC") during a regularly-scheduled EVIC meeting following issuance of a Commission order on this Petition.

Proposed Customer Education and Outreach Budgets

	Customer Education & Outreach Budget	As a % of Total Program Costs
BGE	$ 2,406,510	5.0%
Delmarva	$ 569,140	4.8%
Pepco	$ 1,534,153	4.8%
PE	$ 615,000	5.0%

Objectives

- Build awareness of EV benefits and incentives.
- Alleviate point of sale concerns for those looking to purchase a new, more efficient and environmentally-friendly vehicle.
- Encourage EV customers to be aware of opportunities to utilize EV charging to participate in load and demand response programs.
- Encourage commercial customers to see the value in updating their fleet vehicles to include EVs.
- Inspire business customers to install workplace EV charging stations.
- Support the State's effort to meet its EV goals.
- Leverage regional coordination among utilities and auto manufacturers to support objectives.

Communication Channels

- BGE, Delmarva, Pepco, and PE online EV information, rates, incentives and form and links to other EV resources (EDTA, DOE AFV info, Plugshare, MD-MEA incentives).
- Fact sheets and flyers for community events and fairs (English and Spanish).
- Sponsorship for key stakeholder events/education (first responders, electrical trades, fleets, etc.).
- Opportunities to support ride and drive or similar events with area employers.
- External affairs presentations for community, customer, and business events.
- Press releases and targeted emails with helpful data and information on EV benefits and events.
- Direct mail highlighting the applicable utility's EV incentives, including quick facts.
- Digital (online) and social media advertising campaign linking to the applicable utility's website.

- Short overview videos (used on the applicable utility's website, digital ad campaign, and social media).
- Car dealership communication: fact sheets and utility rates and incentive communication.
- Social media (Facebook, Twitter, Instagram and LinkedIn) and Smart Energy News articles (bill inserts).
- Outdoor ad campaigns (billboards, cinema and shopping malls).

Leveraging and Supporting Regional Collaborative Efforts

Where possible, the Utilities would seek to leverage and support collaborative efforts taking place at the regional level to promote EVs and EV charging. An example is NESCAUM's collaboration with automobile manufacturers (known as "Drive Change. Drive Electric") through a public-private partnership to develop and deliver a brand-neutral, multi-dimensional campaign to increase awareness, consideration, and acceptance of all types of EVs among persons likely to purchase a car in the next 3 – 7 years.

IX. Proposed EV Portfolio Components

The proposed statewide EV Portfolio is comprised of various utility programs designed to achieve the objectives identified in the Commission's January 31, 2017 PC44 Notice, and when taken in their totality, represent a coordinated approach to incentivizing deployment of EVSEs and rate design options in a manner that will increase the efficiency and reliability of the electric distribution system[93] in the context of realizing the aforementioned State public policy goals and commitments. This section provides an overview of the Residential, Non-Residential, Public, Innovation, and Technology Sub-portfolios proposed in each service territory. Included in Attachments C - G are detailed summaries and completed programmatic templates designed to provide the Commission with a snapshot of the following key information for each targeted offering: the program's objective; evaluation metrics linked to the stated objective; projected expenditures; an evaluation plan, including the plan for public sharing and review of key data; and the firm date by which the offering will conclude.

A. Residential Sub-Portfolio

The Utilities propose to include a residential sub-portfolio comprised of various infrastructure and rate design offerings. Detailed descriptions of the proposed residential programs, including the associated templates, are included in Attachment C.

	Smart Level II Charging Station Rebates	EV Whole-House TOU	Smart Level II Charging Station Rebate w/ EV-only Rate Design Component	FleetCarma – Non-rate Incentive for Off-Peak Charging
BGE	✓	✓		
PE	✓			
Delmarva	✓	✓	✓	✓
Pepco	✓	✓	✓	✓

[93] PUA § 7-211(m)(3)(i).

Through the inclusion of these residential programs, the Utilities' offerings are collectively addressing the following goals identified in the PC44 EV Work Group Matrix (Attachment A):

- *All competing technologies are considered and included in the pilot/initiative offerings, as appropriate.*

The Utilities' residential offerings all feature a procurement strategy designed to pre-qualify multiple EVSE vendors, or to list minimum requirements that allow the customer to self-identify a qualifying vendor of his/her choosing. The Utilities proposing to pre-qualify multiple EVSE vendors will update the lists on a rolling basis.

- *Expand EV residential tariff offerings to include participation by retail choice and net metering customers.*

BGE and Pepco are both proposing to continue offering the existing EV whole-house TOU rate, and Delmarva is proposing to adopt the same. In addition, Pepco proposes to re-open its existing EV-only TOU rate and to expand the offering to Delmarva, which will be facilitated by the installation of a second AMI meter; the EV-only TOU offering will allow for the participation by retail choice and net metering customers. All of the Utilities, however, are committed to pursuing an EV-only TOU rate design offering in the near-term that will be enabled by the smart Level II chargers incented through these programs, provided that the Commission accepts the proposed regulatory treatment of EVSEs as an electric submeter, as described in Section X of this proposal.

- *Develop a strategy to address grid-related costs associated with vehicle fleet electrification.*

Across each of the Utilities' proposed residential programs, the incentives provided to residential customers for charging equipment require that the incented EVSE possess "smart" capabilities. The rebate amounts are designed to offset the higher costs associated with purchasing "smart" charging equipment, so that a customer is inclined to go that route and is well-positioned to participate in "next step" programs planned by the Utilities to facilitate off-

peak charging and advanced load management opportunities. The PHI companies propose to include some immediate residential opportunities of this nature to demonstrate the range of possible outcomes, and further propose to pilot a technology that will enable customers with previously-installed non-smart charging equipment to participate in off-peak charging initiatives. BGE is also proposing initiatives as future work supporting EV-only rates, and advanced load management opportunities.

B. Non – Residential Sub-Portfolio

The Utilities propose to include a non-residential sub-portfolio comprised of various infrastructure and rate design offerings. Detailed descriptions of the proposed non-residential programs, including the associated templates, are included in Attachment D.

	Incentives for Multifamily/ Multi-unit Dwellings	Incentives for Workplace Charging	Incentives for Fleets	Incentives for Public-facing C&I Locations
BGE	✓	✓	✓	✓
PE	✓	✓		✓
Delmarva	✓	✓	✓	
Pepco	✓	✓	✓	

Through the inclusion of these non-residential programs, the Utilities' offerings are collectively addressing the following *additional* goals[94] identified in the PC44 EV Work Group Matrix (Attachment A):

[94] The Signatory Parties note that each of the sub-portfolios is designed to achieve some of the goals first highlighted in the Residential Sub-Portfolio section, including: the consideration of all competing technologies in the design of the offering, as well as the development of a strategy to address grid-related costs associated with vehicle fleet electrification.

- *Expand EV tariff offerings to include municipal and corporate fleets, workplace and commercial charging;*

The Utilities' non-residential sub-portfolios all include incentives to install smart chargers at commercial and industrial ("C&I") locations, which enable EV tariff offerings both now and in the future. In this Proposal, BGE, Delmarva, and Pepco all propose to pilot a demand charge rider (credit) that will seek to overcome barriers to installing fast chargers or large quantities of charging stations at workplaces.

- *Facilitate and encourage equitable access to benefits derived from vehicle fleet electrification, especially in underserved market segments;*

During the course of the PC44 EV Work Group, the multifamily and multi-unit dwelling ("MUD") market segments were identified as underserved markets, due to the general lack of permanent, resident-owned, off-street parking opportunities. By proposing incentives and working with property managers to implement the programs, the Utilities' offerings will facilitate equitable access to charging infrastructure for the MUD market segment. Additionally, PE proposes to reserve a portion of its MUD incentives for buildings in which 50% or more of the residents are confirmed as low-income customers.

As will be discussed later, the utilities have proposed an Innovation component that also addresses the objective for supporting the underserved market segments.

C. Public Sub-Portfolio

The Utilities propose to include a public sub-portfolio comprised of various infrastructure offerings. Detailed descriptions of the proposed public programs, including the associated templates, are included in Attachment E.

	Incentives for Public Level II Smart Chargers	Incentives for Public DCFC
BGE	✓	✓
PE	✓	✓
Delmarva	✓	✓
Pepco	✓	✓

Through the inclusion of these public-facing programs, the Utilities' offerings are collectively addressing the following *additional* goals[95] identified in the PC44 EV Work Group Matrix (Attachment A):

- *Expand EV tariff offerings to include municipal fleets;*

BGE's public-facing program specifically targets partnerships with local governments, municipalities, and local government-associated entities to deploy EV charging infrastructure at public locations for the public at-large that these entities serve. The program includes a proposed charging fee to the users of these stations to assure their contribution toward program costs.

- *Facilitate and encourage equitable access to benefits derived from vehicle fleet electrification, especially in underserved market segments;*

The PC44 Work Group identified as a potential action item to address the aforementioned goal the deployment of fast chargers at public locations, which is a component of the public programs proposed by each of the Utilities.

[95] The Signatory Parties note that each of the sub-portfolios is designed to achieve some of the goals first highlighted in the Residential Sub-Portfolio section, including: the consideration of all competing technologies in the design of the offering, as well as the development of a strategy to address grid-related costs associated with vehicle fleet electrification.

D. Innovation Sub-Portfolio

BGE, Delmarva, and Pepco propose to include an innovation sub-portfolio comprised of grant offerings designed to support various charging infrastructure incentives. Detailed descriptions of the proposed innovation fund program, including the associated templates, are included in Attachment F. Through the inclusion of the innovation fund program, the Utilities' offerings are collectively addressing the following *additional* goal[96] identified in the PC44 EV Work Group Matrix (Attachment A):

- *Facilitate and encourage equitable access to benefits derived from vehicle fleet electrification, especially in underserved market segments;*

The grants provided through the innovation sub-portfolio are intended to encourage innovative ideas that are designed to serve multiple users and/or multiple tenant applications, and may include examples such as: electric car share hubs; urban residential charging hubs; DC Fast Charge applications for multifamily applications; and electric public transit or mobility fleet applications. Projects designed to serve underserved and/or low-income areas are desired and encouraged, and grant applications will be reviewed by a team of utility and state agency representatives.

E. Technology Demonstration Sub-Portfolio

Delmarva and Pepco propose to include a technology demonstration sub-portfolio; BGE and PE also propose to include a technology demonstration as a subset of its public sub-portfolio. Detailed descriptions of the proposed offerings, including the associated templates, are included in Attachment G. Through the inclusion of these technology demonstrations, the Utilities'

[96] The Signatory Parties note that each of the sub-portfolios is designed to achieve some of the goals first highlighted in the Residential Sub-Portfolio section, including: the consideration of all competing technologies in the design of the offering, as well as the development of a strategy to address grid-related costs associated with vehicle fleet electrification.

offerings are collectively addressing the following *additional* goals[97] identified in the PC44 EV Work Group Matrix (Attachment A):

- *Develop a strategy to address grid-related costs associated with vehicle fleet electrification*

  DC Fast Charging with Energy Storage (PHI and PE)

PE will be targeting one of the DC Fast charger locations incentivized by its public program, where grid capacity is at a premium, to install an innovation project to demonstrate the combination of an energy storage system with DC Fast charger technology to observe how grid demand can be monitored and limited below a set kW value.

PHI proposes one or more demonstration projects where an energy storage device will be paired with a cluster of DC Fast Chargers. At 100KW or above per charger, multiple chargers are expected to have significant influence on the local distribution system where they are interconnected. This demonstration project will study the potential benefits of using energy storage to mitigate any capacity or power quality impacts caused by the chargers. If successful, this method may prove a beneficial alternative to demand charges or other upgrades which might be required in order to support the spot load.

The above demonstration projects related to the coupling of DCFC with energy storage will provide the Utilities with key insight into the potential mitigation of future grid-related costs that could be associated with the deployment of this type of charging infrastructure.

"Managed Charging" Evaluation Program at BGE Facilities

BGE proposes to implement a "managed charging" program at designated EV Chargers installed at BGE facilities. The EVSE network capabilities would be leveraged to facilitate load

[97] The Signatory Parties note that each of the sub-portfolios is designed to achieve some of the goals first highlighted in the Residential Sub-Portfolio section, including: the consideration of all competing technologies in the design of the offering, as well as the development of a strategy to address grid-related costs associated with vehicle fleet electrification.

management for the EV charging stations on the system. BGE would develop the communication, user education and support to alert and engage the users to the load management functionality. BGE would measure the following as part of the program: the deployment of software capabilities; operations reliability and impact; customer education and notification requirements; and user reaction and satisfaction.

- *All competing technologies are considered and included in pilot/initiative offerings, as appropriate;*

The PC44 EV Work Group identified as one action item designed to further the above goal the evaluation of interoperability standards imposed on EVSE providers. The following technology demonstration proposed by Delmarva and Pepco would address this objective.

Public Charging Interoperability

PHI proposes to select a third party who will execute the transactions between the drivers and the utility owned Level 2 and DC Fast Chargers. This vendor would be responsible for driver registration, identification and secure payment transactions to ensure seamless operation across the Pepco and Delmarva Power owned equipment. PHI will proactively seek agreements with each of the established EV Charging companies (EVgo, ChargePoint, Sema Connect, Blink, Electrify America, Greenlots, etc.) in the region to allow for their registered drivers to utilize the PHI operated networks/stations, and vice versa, utilizing a driver's native or preferred EV network account. Once approved, PHI proposes to initiate this effort beginning in late 2018 to early 2019.

X. Proposed Regulatory Treatment of the Electric Vehicle Supply Equipment as an Electric Submeter

A. Explanation of the Proposal

EVSE offerings are increasingly designed as "smart grid-ready" products that include sophisticated metering and communication platforms. Using these advanced metering and communication capabilities, smart EV charging solutions can be designed to facilitate various ways to collect revenue needed to offset the cost of charging, such as pay-per-charge or subscription-based models. Although such technology widely exists in the EV marketplace today that allows an end-user to be billed on the basis of real-time charging station data, there is no known widely-adopted regulatory approach that facilitates the use of the on-board EVSE metrology by the utilities for rate design or billing application purposes.

Instead, states such as Maryland generally rely on extensive testing, installation, accuracy, and records requirements when qualifying a meter for revenue billing purposes[98] – a process that can be cost-prohibitive for the burgeoning EVSE market as new charging station models continue to emerge. One alternative approach utilized to-date has included the (costly) installation of a second AMI meter so that the utility could offer an EV-specific rate design option. In lieu of installing a dedicated second meter upstream from the EVSE, members of the Work Group considered several different regulatory pathways, one of which is proposed to the Commission through this filing: the modification of the existing electric submetering process for the limited duration of this 2018 - 2023 EV Portfolio program cycle.

According to COMAR 20.25.01.01.A, submetering serves the purpose of "encourag[ing] effective conservation and efficient use of electricity or gas by fairly allocating its cost among

[98] *See generally* PUA § 7-301(a) and COMAR 20.50.05 *et seq.*

the ultimate users within a master metered apartment house, office building, or shopping center." A submeter is downstream from a revenue-grade utility-owned meter and refers to equipment used to determine the actual use of electricity in an individual unit. The owner, operator, or manager of the submetered premise is authorized to collect an additional service charge of $1.00 per month per unit to cover administrative costs and billing.[99] The Commission's Engineering Division is required to approve and maintain a list of submeters installed for billing purposes, and provides oversight with respect to the referee testing and installation and removal of approved submeters.[100] Although the applicable regulations were amended to require that submeters meet the standards outlined in the American National Standard for Electric Meters — Code for Electricity Metering, ANSI C12.1—2001,[101] this degree of specificity is not referenced in the authorizing statute.[102]

While it is acknowledged that the regulatory treatment of certain EVSE models as electric submeters is an imperfect solution, and that certain waivers of regulations would be necessary under this approach, the Signatory Parties contend that good cause is shown for the Commission to grant the below outlined requested temporal waivers. Such limited waivers would allow the pursuit of an innovative, experimental approach to this issue while avoiding both the unnecessary costs associated with a second meter installation and/or the additional costs and work needed to officially certify a "smart" EVSE device, which would accomplish the same end result as the proposal described herein. Further, the requested waivers do not disturb the consumer protection provision in the submetering regulations that permits a customer to request

[99] COMAR 20.25.01.05(H).
[100] COMAR 20.25.01.04.
[101] COMAR 20.25.01.04(A)(2).
[102] *See* PUA § 7-303.

a referee meter test.[103] Additionally, the existing provision that allows for the imposition of $1.00 per month administrative service charge on the submeter account provides a framework in which the utility could pursue rate design options without needing to socialize data access charges that would be incurred by the utility in administering an EV-specific rate.[104]

Lastly, should the Commission grant the following waivers, the Utilities commit to working with the Commission's Engineering Division, other members of Technical Staff, and any other interested parties to develop EVSE-specific metering regulations in conjunction with the Mid-Course Review outlined in this Report. The new EVSE-specific regulations would be derived from existing submetering requirements and lessons-learned during the first half of the program cycle.

B. Requested Waivers for July 1, 2018 – December 31, 2023[105]

As noted in COMAR 20.25.01.01(D), the adoption of the submetering regulations does not preclude the Commission from altering or amending them in subsequent proceedings, and unreasonable hardship to a utility or owner resulting from the application of the chapter permits the Commission to offer temporary or permanent relief. A summary of the requested waivers is presented below.

[103] COMAR 20.25.01.04(I).
[104] Because a charging station typically uploads usage data directly to the manufacturer's cloud-based system, authorized parties are charged a nominal data access fee to connect with the manufacturer's application program interface.
[105] As detailed earlier in the Report, the Mid-Course Review is proposed to take place in the fall of 2020. Draft regulations specific to EVSE metering would be proposed for the Commission's consideration no later than the Mid-Course Review hearings; although the waivers are requested through December 31, 2023 to allow sufficient time for the rulemaking process to conclude.

COMAR Section	Explanation for Waiver Request
20.25.01.01(B)	This COMAR provision contemplates the availability of submetering in apartment houses, office buildings, and shopping centers who are master metered. A limited waiver to expand the applicability of this regulation is requested for the purposes of the EV Portfolio only, so that EVSEs installed under these programs in residential and non-residential settings may be treated as submeters, regardless of the presence of a master meter. The EVSE will be installed downstream from a utility-owned revenue-grade meter.
20.25.01.04(A)(2)	Requiring the EVSE to meet the standards outlined in ANSI C12.1—2001 is likely cost-prohibitive, especially given the rapidly-evolving technologies and broad cross-section of charging station models. Limiting availability to only those EVSEs that have passed ANSI C12.1-2001 testing could stifle the competitive market. Further, EVSEs are commonly designed to be code and standard compliant, and the technical specification sheets associated with the charging stations incented by the utilities' proposals would be submitted to PSC Engineering for review and approval. All other meter accuracy and testing requirements codified in COMAR 20.25.01.04 would remain in full force.
20.25.01.05(H)	This COMAR provision limits the imposition of an administrative charge on the submeter account to $1.00 per month per unit, which may be sufficient to cover any data access charges imposed by the EVSE manufacturer in the residential context. In the non-residential applications of EVSEs as electric submeters, however, the $1.00 per month per unit restriction will likely be unduly limiting since there will be multiple end-users accessing the charging station throughout the month. The Utilities request a waiver of the $1.00 cap in both the residential and non-residential context, so that the full data access charge may be recovered from the end-user as opposed to being socialized as a programmatic cost. In the alternative, the Signatory Parties ask that the Commission interpret this provision to mean that the "per unit" limitation refer to "per transaction" in the non-residential application. Utilities will work with EVSE manufacturers to determine a per customer transaction data access charge that would pass through to the end-user in residential and non-residential settings.

XI. Proposed Cost Recovery for the EV Portfolio

As discussed earlier in this Proposal, the revenues created by this Proposal are likely to wholly offset the residential bill impacts attributable to this Proposal as the State progresses toward realization of its 2025 EV adoption goal. Other societal benefits such as operational cost savings realized by EV owners and the monetized benefit of reduced GHG emissions are projected to accrue with increased EV adoption, which will further offset the costs presented herein. Thus, while the impact of this Proposal is projected to be a net positive for all Marylanders, this section nonetheless outlines the standalone costs associated with the proposed EV Portfolio, broken down by service territory, as well as the cost recovery approaches requested by the Utilities.

A. Cost Recovery Approach

BGE, Delmarva, and Pepco propose to recover the revenue requirement associated with their respective sub-portfolios through electric distribution rates following a normal base rate case proceeding. The following description represents the approach that BGE, Delmarva, and Pepco would individually pursue:

- EVSE program costs, including rebates, program administration, education and outreach (but excluding capital, or fixed assets, and associated costs such as depreciation), would be deferred to a regulatory asset and amortized over a five-year period.
- The regulatory asset would earn a return after the balance is incorporated into rate base as part of a base rate case proceeding.
- Capital assets would be included in rate base and depreciated over their useful lives.
    - EV charging assets assume a 15-year estimated useful life.
- Revenue requirements would be computed consistent with the applicable utility's most recent base rate case. The allocation of the revenue requirement to customer classes would utilize the percentage of base distribution revenue from the most recently authorized base rate case.

- The residential sub-portfolio revenue requirement would be allocated solely to residential classes, and the non-residential sub-portfolio revenue requirement would be allocated solely to non-residential classes.
- The mixed-use sub-portfolios (*i.e.* Innovation incentives, public, and technology demonstration) revenue requirements would be allocated on the basis above to all customer classes.

- Allocated revenue requirements would be applied based on forecasted billing determinants to derive rates.
  - BGE: The average monthly bill impact would be calculated based on the weather-normalized average usage from the company's most recent base rate proceeding, in this instance the Commission Case No. 9406 test year (925 kWh / month).
  - Delmarva: The average monthly bill impact would be calculated based on the weather-normalized average usage from the company's most recent base rate proceeding, in this instance the Commission Case No. 9455 test year (980 kWh / month).
  - Pepco: The average monthly bill impact would be calculated based on the weather-normalized average usage from the company's most recent base rate proceeding, in this instance the Commission Case No. 9443 test year (872 kWh / month).

PE proposes to recover the revenue requirement associated with its sub-portfolios via a surcharge rider assigned to the applicable customer classes. The following protocol would be observed by the Company:

- All EVSE program costs will be amortized over five years and recovered via a surcharge rider, which will be reconciled on an annual basis. Cost recovery includes directly assigned costs respective to each program, as well as allocated program management and consumer awareness costs.
  - The Residential sub-portfolio revenue requirement would be allocated solely to residential classes.
  - The Non-residential sub-portfolio and the Public sub-portfolio revenue requirement would be allocated solely to non-residential classes.[106]
- PE will file with the Commission on or before December 1st of each year for EVSE surcharge rates to be effective during the forthcoming calendar year.

[106] This surcharge rider will be applicable to all customers, excluding street lighting customers.

- The monthly EVSE surcharge rate effective during each calendar year of the 5 year amortization period is made up of 2 components: 1) the programs' amortized amount for the rate-effective year (which will include a true up amount for prior period over/under-collections) and 2) the pre-tax authorized rate of return on the remaining unamortized balance.
    - Prior-period over/under-collections will consist of the actual over/under-collection balance as of October 31st of the filing year and forecasted over/under-collections for November and December of the filing year.
    - PE will offset this surcharge rider by all revenues at the EVSE charging locations that exceed the standard retail tariff charge for the separately-metered service locations. Such incremental revenues will be allocated pro rata to each rate schedule based upon the amount of costs allocated to each rate schedule.

B. Total EV Portfolio Costs, by Utility

The proposed EV Portfolio represents a statewide investment of approximately $104.7 million between mid-2018 and 2023, and is projected to yield over 24,000 EV chargers that will enable smart charging in residential, non-residential, and public settings. Based on these investments, and derived from average monthly usage values for each service territory, residential customers can expect to realize a *peak* monthly impact of: $0.35 (BGE); $0.34 (Pepco); $0.42 (Delmarva); and $0.25 (PE).[107]

[107] These projections do *not* take into account any offsetting revenue generated by utility-owned and operated charging equipment.

Table: BGE Total Program Costs

Offering No.	Program Components	Size (Units)	Estimated Costs
1	**Smart Level II EVSE for Residential Customers (50% Turnkey Cost Cap)**	15,000	$ 7,500,000
2	**Smart Level II & DCFC EVSE for Non-Residential Customers (50% Cap for MUDS, Workplace, Fleet. 25% Cap for Other)**	2,125	$ 10,875,000
3	**Innovation Fund**	490	$ 5,600,000
4	**Utility Owned Public Charging Network**	1,000	$ 17,041,200
5	**Residential Whole House TOU (ongoing)**	-	
6	**Workplace/Fleet Demand Charge Forgiveness**	-	
7	**Managed Charging Evaluation**	-	
8	**EV Only Rate Evaluation**	-	
9	**Managed Charging Pairing with smart thermostat**	-	
	Sub-total	$	41,016,200
	Other Cost		
	Utility Admin	$	573,632
	Customer Education, Enrollment & Regional Outreach	$	2,406,510
	Contracted Program Deployment	$	3,892,503
	Evaluation, Measurement, and Verification	$	241,362
	Sub-total	$	7,114,007
	Total Estimated Costs	**$**	**48,130,207**

Table: Delmarva Maryland Total Program Costs

Offering No.	Program Components	Size (Units)	Estimated Costs
1	**Smart Level II EVSE for Commercial customers (Workplace Charging) (50% EVSE discount and property assessment only, no installation)**	239	$ 1,036,550
2	**Public Neighborhood Smart Level II EVSE**	149	$ 2,235,000
3	**Public DC Fast Chargers**	12	$ 1,440,000
4	**Smart Level II EVSE for Commercial customers Condominiums/Apartments (50% EVSE discount and 100% installation cost covered, not to exceed 100% of the total installation costs less any applicable rebates.)**	50	$ 595,500
5	**Residential Whole House TOU**	Unlimited	$ -
6	**Residential Customers with existing EVSE and receiving FleetCarma units**	37	$ 60,347
7	**Smart Level II EVSE for Residential customers (50% EVSE discount and 50% installation discount, and inspections)**	37	$ 191,500
8	**Residential Customers Smart Level II EVSE rebates of $500 Maximum for 1,000 participants (Once Offering 7 has been satisfied.)**	250	$ 125,000
9	**Innovation Fund**		$ 1,850,000
10	**Technology Demonstration (Energy Storage and Virtual V2G)**		$ 740,000
	Sub-total	$	8,273,897
	Other Cost		
	Billing	$	100,000
	Customer Education, Enrollment & Outreach	$	569,140
	Reward Credit Processing	$	87,750
	Program Management	$	480,000
	Systems Interfaces & Updates	$	2,291,150
	Analysis & Reporting (including EM&V)	$	150,000
	Sub-total	$	3,678,040
	Total Estimated Costs	**$**	**11,951,937**

Table: Pepco Maryland Total Program Costs

Offering No.	Program Components	Size (Units)	Estimated Costs
1	**Smart Level II EVSE for Commercial customers (Workplace Charging) (50% EVSE discount and property assessment only, no installation)**	667	$ 2,861,150
2	**Public Neighborhood Smart Level II EVSE**	414	$ 6,210,000
3	**Public DC Fast Chargers**	33	$ 3,960,000
4	**Smart Level II EVSE for Commercial customers Condominiums/Apartments (50% EVSE discount and 100% installation cost covered, not to exceed 100% of the total installation costs less any applicable rebates.)**	200	$ 2,370,000
5	**Residential Whole House TOU**	Unlimited	-
6	**Residential Customers with existing EVSE and receiving FleetCarma units**	100	$ 163,100
7	**Smart Level II EVSE for Residential customers (50% EVSE discount and 50% installation discount, and inspections)**	100	$ 512,500
8	**Residential Customers Smart Level II EVSE rebates of $500 Maximum for 1,000 participants (Once Offering 7 has been satisfied.)**	750	$ 375,000
9	**Innovation Fund**		$ 5,000,000
10	**Technology Demonstration (Energy Storage and Virtual V2G)**		$ 2,000,000
	Sub-total	$	23,451,750
	Other Cost		
	Billing	$	50,000
	Customer Education, Enrollment & Outreach	$	1,534,153
	Reward Credit Processing	$	135,000
	Program Management	$	480,000
	Systems Interfaces & Updates	$	6,416,300
	Analysis & Reporting (including EM&V)	$	150,000
	Sub-total	$	8,765,453
	Total Estimated Costs	**$**	**32,217,203**

Table: PE Total Program Costs

Offering No.	Program Components	Size (Units)	Estimated Costs
1	**Level 2 Charger Rebate for Residential Service Locations**	2000	$ 1,000,000
2	**Level 2 Charger Installation at Commercial/Industrial Service Locations**	150	$ 2,269,350
3	**Level 2 Charger Installation at Multifamily Service Locations**	50	$ 756,450
4	**Level 2 and DC Fast Chargers at Public Service Locations**	59	$ 2,137,450
	Sub-total	$	6,163,250
	Other Cost		
	Networking Fees	$	837,700
	Customer Engagement	$	615,000
	Program Management	$	3,265,750
	Maintenance agreements on chargers	$	570,540
	Service Plan for driver support, access control, etc.	$	385,500
	Property Tax	$	132,932
	Wiring installation reimbursement	$	250,000
	Evaluation, Measurement, and Verification	$	61,603
	Other O&M	$	100,000
	Sub-total	$	6,219,025
	Total Estimated Costs	**$**	**12,382,275**

XII. Next Steps – EV Portfolio Advisory Council

The EV Portfolio proposed herein represents a concerted effort to lay the foundation for an EVSE infrastructure build-out supportive of State public policy goals while preserving the reliability and efficiency of the grid. The technologies that would be incented by this Proposal enable options for advanced load management and innovative rate design, which represent iterative opportunities that the Utilities are committed to pursuing. Indeed, several initiatives proposed for immediate consideration aim to pilot some of these approaches in advance of wider-scale deployment. Thus, the Signatory Parties propose the continuation of a stakeholder-driven work group process incorporated into the EV Portfolio Advisory Council,[108] coupled with definitive timelines and a non-exhaustive list of ideas that provide insight into potential next steps.[109] Examples of items to be pursued by the EV Portfolio Advisory Council's stakeholder work group include:

EV Only Rate (No Second Meter Required)[110]

The Utilities propose to evaluate opportunities for an EV-only rate that allows for metering without a second utility meter. By 2020, BGE will review initial findings from the PC44 rate design pilot and PE will analyze its experience with using EVSE as a measuring device to evaluate possibilities and opportunities for EV-specific rate or managed charge options. PHI will evaluate the data from its residential smart chargers as well as from the FleetCarma program offering to validate the use case that incentives can be assigned without the need for a second meter. The Utilities will continue to support the State efforts

[108] The EV Portfolio Advisory Council, as defined earlier in this Proposal, would serve as a standing review body that provides feedback on a rolling basis to the Utilities regarding the implementation of their respective programs. The EV Portfolio Advisory Council will also oversee a Communications Advisory Board, and a stakeholder-driven work group designed to pursue the next steps outlined in this Section. At a minimum, the EV Portfolio Advisory Council will be comprised of representatives from the Signatory Parties, Staff, and OPC, as well as any other interested party.

[109] Insights and recommendations proffered in the 2016 EPRI Report on the Pepco Pilot will be reviewed and considered during the development of the initiatives contemplated in this "Next Steps" section, including the suggestion that an off-peak period (for EV TOU tariffs) shift from 8:00 p.m. to 10:00 p.m. to mitigate some transformer over-loading. ML#189769: *Final Report – Results, Insights, and Customer Metrics*, EPRI (April, 2016) at 10-2.

[110] Note that PHI, who already has experience administering an EV-only TOU rate, proposes to expand its tariff to additional Pepco customers and launch the offering in its Delmarva Maryland service territory as part of the instant Proposal. BGE and PE will incorporate lessons-learned from the PHI tariff offerings into the EV-specific rate offerings scheduled to be proposed in the BGE and PE service territories by 2020.

to identify and address opportunities to advance EV charging options with smart technology, and the State efforts to identify any regulatory or legislative opportunities that may support this need.

Managed Charging with PeakRewards®

BGE proposes to evaluate the possibilities associated with pairing a customer's smart thermostat with smart EV charger devices by the end of 2021. BGE recently began using a smart thermostat as part of its PeakRewards® program. Many smart EV chargers offer pairing with smart home devices. BGE would work to pair this thermostat with installed EV smart chargers to control the level of EV charging much like air conditioner cycling during peak demand periods. With this pairing, BGE could communicate with the smart thermostat to control the level of EV charging.

Assess Network Interoperability

The Utilities propose to work with EVSE vendors, network providers, and other stakeholders to assess opportunities to allow networks to work seamlessly on behalf of their customers, enabling the customer to charge on multiple networks with greater ease. A report stemming from these efforts, along with any associated recommendations, will be filed in conjunction with the Utilities' "Final Review" reports due to the Commission by March 1, 2023.

Study DCFC Barriers and Opportunities

The Signatory Parties acknowledge the challenges the charging services industry faces in deploying adequate DCFC infrastructure today. Several of the Utilities have proposed measures in the Attachments below to mitigate or avoid demand charges that challenge the economics of DCFC deployment at current and near-term levels of EV penetration. While these pilot proposals are implemented over their 48-month time frame, the Signatory Parties request that the Commission open a new proceeding to explore how the Utilities can increase opportunities for the private market to deploy economic DCFC infrastructure in areas critical for EV adoption, including but not limited to: highway corridor, fleet, and multifamily residential applications. The proceeding should conclude no later than one year from the conclusion of the Utilities' programs with recommendations that can facilitate the sustainable, long-term, and comprehensive deployment of DCFC infrastructure needed to achieve state goals.

In addition to the aforementioned utility-led initiatives, the Signatory Parties also propose for the Commission's consideration three potential work streams that could be overseen by the EV Portfolio Advisory Council, all of which could benefit from the use of monies reserved to

support the State's grid modernization efforts.[111] The first concept contemplates a statewide survey to assess existing EVSE signage and the operating status of currently-installed, public charging stations. One concern that has been voiced within the industry pertains to the maintenance of charging infrastructure that is publicly-available but privately-owned, and whether shortcomings in the operational status of previously-deployed infrastructure contribute to the identified issue of "range anxiety." The results of such a statewide survey, especially as they may pertain to the identification of malfunctioning equipment, could be shared with the identified EVSE manufacturers, as well as the EVSE vendors participating in the EV Portfolio proposed herein. While the pre-existing relationship between the EVSE manufacturer and the private site host of previously-deployed charging infrastructure may not have contemplated ongoing O&M support, the EVSE vendor community has a vested interest in the perception of the burgeoning Maryland market that will likely render them a receptive audience and a capable partner in dispensing with the survey's results.

Indeed, the public *perception* of the availability of operational EVSE competes for importance in many ways with the *actual* availability of public charging infrastructure, and thus we should strive to ensure that customer confidence in the proposed EV Portfolio is not undermined by the operational status of existing infrastructure. The maintenance of charging infrastructure incented by the proposed EV Portfolio remains a variable within our control and will be accounted for in the criteria used to select qualified EVSE vendors for the various programs. Nonetheless, the statewide survey could be refreshed three years from commencement of the EV Portfolio (*i.e.* July 2020); the results of which could also contribute to the planned EM&V assessment. Therefore, the Signatory Parties request Commission approval

[111] The Commission set-aside $2,195,586 of funding derived from the Most Favored Nation's ("MFN") compliance filing in the case of the merger of Exelon Corporation and Pepco Holdings, Inc. Pursuant to Commission Order No. 88128, this funding is to be used in support of the Commission's grid-of-the-future proceeding, *i.e.* PC 44.

for use of up to $100,000 of non-ratepayer funding derived from the grid-modernization monies to support the execution of the articulated statewide survey proposal, to be competitively bid and procured by the Exelon companies.

The second concept, as articulated by the independent, market-focused nonprofit Rocky Mountain Institute ("RMI"),[112] contemplates funding to support the development of a model for implementing an electrified mobility solution in low- to-moderate ("LMI") communities within Maryland. The need for equitable access to electrified mobility solutions in LMI communities is well recognized. A study could be conducted that would clarify the requirements for these solutions, and identify possible solutions that could be implemented in the State, creating an example that the rest of the nation could emulate to meet their LMI mobility needs. Potential solutions that could ultimately be implemented include EV ride-share and car-share programs that could provide LMI communities with electric transportation resources, reduce air pollution, and increase access to electrified mobility solutions. The estimated cost to complete such a study is $150,000, and the projected timeline for completion of the study is by the end of calendar year 2018.[113]

The final concept, as articulated by MJB&A,[114] requests funding in support of an analysis to evaluate and summarize the status of current and planned DCFC infrastructure within the State, which would yield a framework for stakeholders to identify suitable locations for such

[112] RMI developed a concept proposal illustrative of this request, which is provided for informational purposes as Attachment H. This Proposal requests Commission approval for use of the funding to support the study described herein. If approved, the procurement would be conducted by Exelon consistent with any Commission guidance provided in response to this request.

[113] Note that funding for the charging infrastructure needed to support the specified LMI solution could then potentially be awarded through the Innovation Incentive Fund proposed by BGE, Delmarva, and Pepco as part of the EV Portfolio.

[114] MJB&A developed a concept proposal illustrative of this request, which is provided for informational purposes as Attachment I. This Proposal requests Commission approval for use of the funding to support the study described herein. If approved, the procurement would be conducted by Exelon consistent with any Commission guidance provided in response to this request.

infrastructure to ensure that once installed, it is likely to be utilized. Using a geographic information systems ("GIS") based spatial analysis to explore and develop key metrics, such as existing infrastructure, commercial activity, demographic data, key roadways and traffic patterns across the State, the project would result in an interactive database that could assist the Utilities in siting DCFC infrastructure to be incentivized by the EV Portfolio.

Although the backbone of the EV Portfolio is that applications for infrastructure incentives will be largely customer-driven, each utility commits to evaluating the applications within certain parameters described in Attachments C – G, which could be bolstered by the GIS-based analysis described here when evaluating applications for DCFC infrastructure incentives. While the NREL EVI-Pro analysis completed already for the State provides a certain degree of granularity with respect to the dispersion of the demand for public charging infrastructure in the State, the GIS-based analytical tool contemplated here would take this information a step further. The DCFC incentives proposed as part of the EV Portfolio are finite in nature and cannot span the entire gap identified by NREL; thus, the GIS-based analytical tool would assist the Utilities in siting the limited number of DCFC stations incented by the instant Proposal by taking into account different weighting scenarios of unique factors as suggested by stakeholders. The tool could then be made available for use by other interested stakeholders, especially the EVIC, in targeting investments in DCFC infrastructure moving forward.[115]

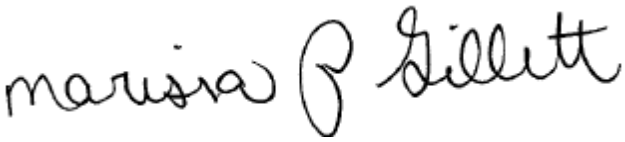
[115] If approved, the Signatory Parties note that the development of the DCFC tool will be conducted in the timeframe suggested in Attachment I so as not to unduly delay the deployment of DCFC infrastructure contemplated by the Proposal.

XIII. Conclusion

For the above reasons, the Signatory Parties respectfully request that the Commission grant this Petition and implement the statewide EV Portfolio according to the proposals and timelines presented herein.

Respectfully Submitted,

PC44 EV Work Group Leader
Baltimore Gas and Electric Company
Delmarva Power & Light Company
Potomac Electric Power Company
The Potomac Edison Company
ChargePoint
Greenlots
Natural Resources Defense Council
Sierra Club
Chesapeake Climate Action Network
Institute for Energy and Environmental Research
Marylanders for Energy Democracy and Affordability
Pace Energy and Climate Center
Solar United Neighbors of Maryland
Nuclear Information and Resource Service



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/s/

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Counsel to Baltimore Gas and Electric Company

**By this signature, Baltimore Gas and Electric Company confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. Baltimore Gas and Electric Company may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding Baltimore Gas and Electric Company's position in other state or federal proceedings.*

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202-872-2318

Counsel to Potomac Electric Power Company and Delmarva Power & Light Company

**By this signature, [Party] confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. [Party] may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding [Party's] position in other state or federal proceedings.*

/s/

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Counsel to The Potomac Edison Company

**By this signature, The Potomac Edison Company confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. The Potomac Edison Company may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding The Potomac Edison Company's position in other state or federal proceedings.*

/s/ *Anne Smart*

Anne Smart
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On behalf of ChargePoint

**By this signature, ChargePoint confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. ChargePoint may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding ChargePoint's position in other state or federal proceedings.*

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Authorized Representative of Greenlots

**By this signature, Greenlots confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. Greenlots may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding Greenlots position in other state or federal proceedings.*

/s/ _____
Noah Garcia

Noah Garcia
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Authorized Representative of Natural Resources Defense Council

**By this signature, Natural Resources Defense Council confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. Natural Resources Defense Council may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding Natural Resources Defense Council's position in other state or federal proceedings.*

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Counsel to Sierra Club

**By this signature, Sierra Club confirms its support for the Petition and Proposal to Implement a Statewide EV Portfolio. Sierra Club may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding Sierra Club's position in other state or federal proceedings.*

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Counsel to Chesapeake Climate Action Network, 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

**By this signature, Chesapeake Climate Action Network, 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 confirm their support for the Petition and Proposal to Implement a Statewide EV Portfolio. Chesapeake Climate Action Network, 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 may provide comments, or reply comments, in support of the Proposal, but will not seek any modification to the terms of the Proposal. This Proposal is not intended to serve as a binding precedent regarding Chesapeake Climate Action Network, Institute for Energy and Environmental Research, Marylanders for Energy Democracy and Affordability, Pace Energy and Climate Center, Solar United Neighbors of Maryland, or Nuclear Information and Resource Service's position in other state or federal proceedings.*

Attachments

Attachment A – PC44 EV Work Group Goals and Objectives Matrix

Guiding Principles of the PC 44 EV Work Group
1.Support Maryland's clean air and water objectives by advancing the adoption of EVs in the State and attaining Maryland's Zero Emission Vehicle (ZEV) targets. Maryland's specific goal through the ZEV MOU is 60,000 ZEVs on the road by 2020 and 300,000 vehicles by 2025. 2. Seek to promote and incentivize the most cost-effective and environmentally sustainable EVSE solutions, while offsetting the need for infrastructure upgrades. 3. Ensure that any outcomes of the Work Group are not at odds with other State or PSC initiatives.

Goals (i.e. the desired outcomes)		Objectives (i.e. action items to achieve the stated goals)		
Increase EV tariff offerings across multiple service territories	*All competing technologies are considered and included in pilot/initiative offerings, as appropriate*	Identify and develop plans or demonstrations/pilots for leveraging technology to support EV adoption. ○One specific idea is to look at technology options for an EV-only rate that does not require a second utility meter or the associated wiring for that meter.	Evaluate potential managed charging initiatives and potential vehicle-to-grid initiatives, including an assessment of associated costs, benefits, and barriers to implementation.	Evaluate the interconnection and interoperability standards imposed by the local utility on privately-owned EVSE
	Expand EV residential tariff offerings to include participation by retail choice and net metering customers	Remove barriers to participation by choice customers in resulting rate design options	Facilitate the integration of customer-sited renewable resources into the rate design offerings.	Design an EV tariff offering inclusive of a supplier TOU component
	Expand EV tariff offerings to include municipal and corporate fleets, workplace and commercial charging	Deploy fleet or workplace charging rate options	Integrate offerings with demand response programs	
Plan for a limited utility infrastructure investment in EVSE		Complete an EV infrastructure gap analysis of the Maryland market by end of calendar year 2017. ○The baseline for the analysis could be the 2012 State Infrastructure Plan Analysis report prepared by Parsons Brinckerhoff for the Maryland Electric Vehicle Infrastructure Council. ○An independent third party could conduct the analysis, which should consider the current state and planned EVSE investments, including any potential contributions from the pending VW settlement.	Explore and help define the regulatory pathway for utility investment in electric vehicle charging infrastructure ○Utilize different program structures or ownership models for utility investment in order to gain an understanding of the advantages and disadvantages of different approaches ○Ensure that utility investment also fosters a competitive market and engagement of third party vendors of EV supply equipment and services in a manner that supports continued growth of the broader EV charging industry	Define a prospective EVSE siting strategy.
Develop a strategy to address grid-related costs associated with vehicle fleet electrification, including issues involving utiltiy cost recovery		Conduct an assessment of utility plans to accommodate current and projected EV growth in their service territories. Assess the overlap or interaction with PJM load forecasting methodology.	Develop a strategy in partnership with other state agencies and in consultation with the utilities to address grid-related costs associated with vehicle fleet electrification, such as offsetting possible costs through efficiency programs and renewable sources	Deploy rate design options in a manner in which price signals and load management practices are effectively utilized to maximize benefits to the system, electric customers, including facilitating the integration of renewable resources
Facilitate and encourage equitable access to benefits derived from vehicle fleet electrification, especially in underserved market segments		Increase access to EV charging beyond single-family homes with a focus on multi-family dwellings, workplaces, and public high-power fast charge locations	Target an appropriate level of investment in underserved, environmental justice and economically disadvantaged communities to increase equitable access to EVs and infrastructure. Consider providing enhanced incentives for limited-income or shared-ride electrification initiatives.	Increase deployment of AC Level 2 and Direct-Current (DC) fast charging infrastructure in public, multi-unit dwellings, and other underserved market segments.
Develop a customer education/outreach/ engagement strategy in coordination with state agencies to promote the outcomes of the PC44 EV work group proceeding		Prepare a plan to provide the public with information and education on EVs, including incentives for ownership ○Supporting efforts could include EV awareness campaign and interest tracking among utility customers; links or information on available incentives and rebates; other EV-related guidance on website and educational material.	Investigate the authority of the PSC to require or incent utility customers to inform utilities of the acquisition of an EV to ensure system reliability.	Engage in an ongoing "big think" around impactful investments, including a focus on underserved communities/transit, etc.

Attachment B – Examples of Adjustments to the EV Portfolio Based on Stakeholder Feedback Received through the PC44 EV Work Group

BGE Proposal Adjustments

BGE appreciates the comments and feedback from the stakeholders in the working group including BEVI, ChargePoint, Greenlots, Polity Partners, MD OPC, MDE and MEA, and the Joint Comments from Sierra Club, Pace Energy & Climate Center, NRDC, Fuel Fund of Maryland, Institute for Energy & Environmental Research, Marylanders for Energy Democracy and Affordability, Nuclear Information and Resource Service and Solar United Neighbors of Maryland, and others received throughout the workgroup process. Several of the key themes from the comments include:

- The total number of non-residential incentives and options beyond workplace, fleet and MUD applications
- Support for Multi-unit dwelling charging applications
- Advancing opportunities for Managed Charging
- Considering EV Only TOU rate offer
- Level of incentives for DC Fast Charging
- Several considerations around the utility owned network concerning scope, vendor opportunities, and pricing

In consideration of the comments and discussions with stakeholders, BGE has made several changes to our proposal specific to the comments.

Number of non-residential charger incentives:

- BGE has increased the number of non-residential incentives for Workplace, MUD and fleet incentives from an initial base of 1020 units to a revised proposal of 1965 units for non-residential.
- BGE has added a new category "non-residential – other" to the non-residential incentives to extend support to other non-public charger installations, included in the 1965 noted above.

Support for Multi-unit dwelling charger applications:

- As noted above, BGE has increased the total non-residential incentive numbers, including those intended for MUDs.
- BGE will review the non-residential incentive distribution mid-program cycle and consider if changes are needed to the incentive or offer to assure MUD for residential applications is fairly represented in the overall program. BGE proposes to review the incentive options for the MUD application component should MUD applications represent 250 chargers or fewer of the anticipated application target through 2020. If fewer than 250 chargers have been deployed in the MUD segment by 2020, BGE will review incentive levels and customer education and outreach targeting this market segment, and recommend for Commission approval new, more robust incentive levels and/or customer education and outreach efforts in coordination with the EV Portfolio Advisory Council to be implemented no later than 180 days after the Mid-course Review.

Attachment B – Examples of Adjustments to the EV Portfolio Based on Stakeholder Feedback Received through the PC44 EV Work Group

Advancing opportunities for Managed Charging:

- The language expressing the requirements for the ability for customers to manage their charging has been strengthened in the incentive proposals
- A technology evaluation of linking "smart thermostats" to "smart" charging capabilities is added

Consider EV Only TOU rate offer

- BGE is excited about the prospect of alternate options to utility metering for EV only rate applications and appreciates the work underway on Rate Design TOU pilots starting in 2018. BGE has added an evaluation of residential EV Only rate options for 2020 drawing on the learnings of the pilots.

Levels of Incentives for DC Fast Chargers:

- BGE has reviewed the level of incentives for DC Fast chargers and does not propose a change at this time. The incentive levels appear to support the portion of net costs for a project as described in the incentive outlines and complements the MEA and other incentives available.

Several considerations around the utility owned network concerning scope, vendor opportunities, and pricing

There have been extensive discussions concerning the utility owned EVSE network proposals, particularly with interested parties.

- Scope of the utility proposal:
  - BGE's proposal is purposely designed to be an enabler to the growth of the overall EV market, and to provide a resource for public charging where municipal, city and state governments may see a need for charging to support their constituents.
  - While BGE will review the overall numbers with any further updates to the gap analysis from NREL, the proposal is framed as "up to" and is dependent on the requests of the state and local entities, and the mix of Level 2 and DC Fast Charge units, to determine the final number deployed.
- EVSE Vendors included:
  - BGE is the owner and operator of the equipment and network. It is important for the network deliver a consistent, quality experience to the users and be reasonable to administer and maintain. BGE will solicit multiple vendors in the RFP as providers of the charging equipment. The selected vendors must be able to work through the selected network vendor for station operations, customer administration, billing and station communications. BGE will retain the decision of which vendor product is deployed for a site.
  - BGE has also offered to collaborate with the Maryland utilities, EVSE providers and network providers toward the goal of having networks interact seamlessly on

behalf of their customers, enabling the customer to charge on multiple networks with greater ease.

- Charging Service Pricing
  - BGE will set the price for charging across the utility owned network. This will allow consistency for users across the network and allow transparency of the costs and revenue expectations for the regulators.

PHI Proposal Adjustments

PHI appreciates all of the comments and feedback received from stakeholders in the PC44 EV Work Group. In recognition of the role of the competitive market both now and moving forward, PHI reviewed at length the EVSE vendor concerns expressed during the course of the Work Group and tried to be inclusive in the offerings, specifically:

Residential Level 2 offering– PHI will create a specification for the desired functionality of the Smart EV Chargers and solicit the vendor community for responses. PHI would like to qualify multiple vendors to deliver product in this area and intends to allow the customers to choose their respective vendors. Since PHI will be conducting Demand Response events using these chargers, each qualifying vendor will have to have the ability to control their chargers through these events. PHI is also adding 1,000 residential rebates to be available once the other residential EVSE-related offerings are fully subscribed.

Multi-dwelling Unit/ Workplace Offering –PHI has decided to increase the number of multi-dwelling chargers to 250 to be divided between Pepco and Delmarva Power customers. PHI would solicit multiple vendors for the ability to serve this need and will likely qualify multiple vendors here as well; however, the Company will decide the locations and divide the chargers as equally as possible across these prospective sites.

Public Charging (Level 2 and DCFC) - PHI discussed this topic at length, and in the interest of fairness, will seek multiple vendors for these applications. However, PHI will determine the distribution of the chargers and will act as the site host. PHI will endeavor to select sites primarily in underserved areas; however, if by mid-program cycle the total deployed number of chargers is less than 50% of the target, the Company intends to reserve the right to seek alternative installation sites, which may include commercial locations. PHI will be the Site Host / Operator of these chargers and will seek a vendor to manage the transaction / customer experience side of the equipment. This will provide a seamless experience across the Pepco and DPL service territories. In addition, PHI expects that during the course of this deployment, it will leverage that transaction management system in order to allow for interoperability with customers of existing EVSE vendors – provided that the vendors agree to participate.

Attachment B – Examples of Adjustments to the EV Portfolio Based on Stakeholder Feedback Received through the PC44 EV Work Group

PE Proposal Adjustments

PE appreciates all of the comments and feedback received from stakeholders in the PC44 EV Work Group, and has made certain notable adjustments to its proposal to reflect some of these considerations:

Additional Charger Configurations for Multifamily, Commercial and Industrial, and Public Service Locations: To address a concern that customers should have more options regarding their EVSE technology in the program, PE modified its multifamily, commercial and industrial, and public programs to include an option for customers to install a Level 2 charger behind the meter of the current service location. This charger configuration will allow customers to both choose and work with their EVSE vendors, as well as to establish a charging price.

Multiple EVSE Vendors: PE will solicit one or more EVSE vendors in an effort to promote participation by multiple EVSE vendors within PE's program and to obtain charging data from multiple platforms.

Residential Data Acquisition: In response to a request that the residential program provide additional evaluation metrics, PE modified the residential program to require customers to either purchase or lease "smart" Level 2 chargers, which are enabled to track and communicate interval charging data. To be eligible for a rebate through the residential program, customers must agree to have this charging data communicated to PE for review and evaluation purposes.

Attachment C:
Residential Sub-Portfolio

Participating Utilities

BGE Program Offering #R1, #R2

PE Program Offering #R1

Delmarva Program Offering #R1, #R2, #R3, #R4

Pepco Program Offering #R1, #R2, #R3, #R4

Attachment C – Residential Sub-Portfolio

A. BGE Program Offering #R1: Residential EV Charging Incentives

BGE proposes to offer its residential electric customers an incentive (in the form of a rebate check) to select and install advanced and controllable Level 2 ("L2") EV chargers at their residences. The proposed incentives would be a monetary rebate issued by BGE in an amount of up to 50% of the cost, after other incentives, of the project to purchase and install the EV charger at the residence. The project cost amounts to which the rebate would apply would be the net project cost after applying all available grants from MEA and the federal government, as well as all other applicable incentives, grants, awards, and discounts. For example, if a total project cost is $2,000 without any incentives or rebates, but there is an available rebate from MEA in the amount of $700 and a local incentive of $200, the BGE rebate would be applied against a total net project cost of $1,100.

Incentive Amounts

- Rebate amounts capped at $500/advanced L2 EV charging unit.
- Maximum award is $1,000/customer (for account holders siting multiple charging units).
- Rebate amounts and total program budget can shift +/- 10% based on program success.

Eligibility Criteria

- Active or pending BGE residential account holder who installs or has installed an advanced L2 EV charger at their residence during the incentive program period.
- L2 EV charger must only serve private charging needs (account holder's EVs and those of tenants, residents, guests).
- Only applicable to charging infrastructure for on-road vehicles.
- Project costs may include the EV charging station, required electrical equipment, electrical installation costs, and EV charger installation costs.
- L2 EV charger must provide BGE customer with "smart" functionality such as the ability to view and analyze billing quality use data, and to remotely manage EV charger loads and demand.
    - Example eligible L2 EV chargers include the following:
        - JuiceBox Pro 40 & Pro 75
        - Clipper Creek HCS-40 JuiceNet Edition
        - AeroVironment EVSE-RS JuiceNet Edition
        - ChargePoint Home
        - Siemens VersiCharge SG
    - Other vendors and products can be considered when sufficient documentation supporting the desired advanced functionality is provided to BGE.
- Residential account holder can select any EV charger vendor and installation contractor so long as the EV charger functionality requirements are met.

Program Timeline

- The proposed program would begin in 2018 and run for five years, through 2022.
- BGE would begin taking rebate applications upon Commission program approval.
- BGE would accept completed applications with supporting paperwork received by November 30, 2022 (in order to process and issue rebate checks no later than December 31, 2022).

Program Metrics

- Applications by year
- Number of potential EV chargers installed
- Incentives paid
- Administrative costs
- Number of actual EV chargers installed
- Comparison of energy use profiles between homes receiving smart EV charger rebates, homes with EV chargers that did not receive a rebate, homes currently on the offered EV rate, and homes currently on the offered EV rate that receive an EV charger rebate. This analysis would be provided in the closing report.

Procurement Strategy

BGE will publicly post a list of minimum requirements for EVSEs eligible to receive an incentive through this program. The customer will purchase the EVSE and work with an installation contractor. After completion of the work, the customer will submit documents to BGE for Incentive Award.

Estimated Program Units and Costs

BGE estimates the following regarding the number of rebate incentives paid and the corresponding program costs over the life of the program (2018-2022):

Residential						
	2018	2019	2020	2021	2022	Rounded Totals
Chargers	1,300	2,100	2,900	3,800	4,900	15,000
Incentives	$650,000	$1,050,000	$1,450,000	$1,900,000	$2,450,000	$7,500,000
Education	$51,688	$83,497	$115,305	$151,089	$194,826	$596,406
Nescaum	$31,314	$31,314	$31,314	$31,314	$31,314	$156,570
Admin	$15,552	$25,123	$34,693	$45,460	$58,619	$179,447
EMV	$6,544	$10,571	$14,597	$19,128	$24,665	$75,504
Deployment	$105,532	$170,475	$235,417	$308,478	$397,774	$1,217,676
Annual Sums	$860,630	$1,370,979	$1,881,327	$2,455,469	$3,157,198	$9,725,603

*Annual sums include incentives, education and program administration costs.

As noted above, BGE plans on awarding 15,000 rebates over the five-year lifespan of the program. The total program cost will be just under $9.7 million.

BGE Program Offering #R1						
Program Offering	Level 2 Smart Charging Stations for Residential					
Sub-portfolio	Residential					
Brief Description	Propose to offer BGE's Residential customers incentives to choose and install advanced and controllable L2 Chargers at their residence. BGE proposes to provide an incentive of up to 50% of the cost of the project, where costs are net of MEA, and other applicable incentives, grants, awards, and discounts.					
Ownership Model	Rebate (site-host owned)					
EVSE Procurement Overview	BGE to list minimum requirements. Customer purchases EVSE and Installation Contractor. After completion of work, customer submits documents to BGE for Incentive Award.					
Cost to Participant	Project Costs include Charging Station, Electrical Equipment, Electrical Installation, and Charger Installation. Customer submits to MEA for 40% Rebate (capped at $400) and then submits to BGE for 50% rebate on remainder (capped at $500).					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Incentive Budget[116]	$650,000	$1,050,000	$1,450,000	$1,900,000	$2,450,000	$7,500,000
Non-Incentive Budget[117]	$210,630	$320,979	$431,327	$555,469	$707,198	$2,225,603
Total Program Costs	$860,630	$1,370,979	$1,881,327	$2,455,469	$3,157,198	$9,725,603
Forecasted Measures - Level II	1,300	2,100	2,900	3,800	4,900	15,000
Objective of the Program Offering	•Raise EV-owning customer awareness of their charging use and enable them through managed charging to lessen impacts on the local distribution grid. •Plan for future enhancements such as reading charger energy use directly at the charger; ensure installation of smart Level II chargers capable of participating in BGE's planned "next steps" offerings.					
Evaluation metrics	Applications by year; Number of potential chargers installed; Incentives paid; Administrative costs					
Evaluation plan	BGE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics. Additionally, the Residential Program will allow for a comparison to be made between Incentivized Smart Charger Houses, "Normal" EV Houses, EV Houses on the EV Rate, and Incentivized Smart Charger Houses on the EV Rate.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date	Planned start – accept applications starting July 2018, close out by Dec. 2022.					

[116] The incentive budget reflects the rebate amounts to customers.
[117] The non-incentive budget reflects customer education and outreach (including NESCAUM), program administration, program deployment, and evaluation, measurement and verification costs.

B. BGE Program Offering #R2: Whole-House Time-of-Use Rate

BGE commits to continuing the whole-house time-of-use ("TOU") rate currently available to owners of EVs. This rate, known as Schedule EV, is available to BGE Standard Offer Service residential customers who purchase or lease a plug-in EV and charge the EV through a connection to BGE's electric distribution system. Customers must request Schedule EV service and must charge their EV at their primary residence on a single TOU meter that is also used to measure consumption at the whole-house level. Customers are billed summer rates for usage from June 1 through September 30, and non-summer rates for usage from October 1 through May 31. There is no immediate change proposed for the rate.

BGE Program Offering #R2						
Program Offering	Whole House Time of Use Rate					
Sub-portfolio	Residential					
Brief Description	This program component is a continuation of an existing BGE tariff. The program provides discounted off-peak rate for both the vehicle and residence. No changes are proposed at this time.					
Ownership Model	Off-peak rate discount					
EVSE Procurement Overview	N/A					
Cost to Participant	No direct cost to the participant.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Incentive Budget	N/A					
Non-Incentive Budget						
Total Program Costs						
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering.					
Evaluation plan	BGE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	This program offering is currently approved by the Commission as a permanent tariff. Future modifications, if any, will be brought to the Commission for review and approval.					

C. PE Program Offering #R1: Level II Charging Station Rebate

At residential service locations, PE customers will be eligible for a 50% rebate (not to exceed $500) of their AC Level 2 "smart" charger purchase or upfront leasing costs. To participate, customers must select a charger that has been previously qualified by PE. The PE rebate will be applied to the total costs associated with the charger and the charger's installation after rebates from other organizations have been applied. On a first come, first serve basis, PE will offer up to 2,000 rebates for chargers installed at residential service locations as part of the Pilot Program.

Incentive Amounts

- A 50% rebate (not to exceed $500) of their AC Level 2 "smart" charger purchase or upfront leasing costs.

Eligibility Criteria

- Provide PE with a copy of their EV registration or lease agreement, which confirms that either the customer or another member of the service location is the driver of an EV;
- Provide PE with proof of the customer's purchase or lease of a qualified EVSE;
- Install an EVSE with smart charging capabilities that is capable of communicating interval data related to charging timing, frequency, and usage to PE;
- Agree to communicate this charging data to PE as part of the Pilot Program; and
- Provide PE with the right to inspect any EVSE installation before issuing the rebate.

Program Timeline

- PE proposes its Pilot Program to begin on January 1, 2019 and conclude on December 31, 2023.

Program Metrics

To participate in the program, customers must agree to have their interval data related to their timing, frequency, and daily charging usage transmitted to PE. PE will use this data to determine baseline charging profiles at residential service locations, as well as to evaluate this data for purposes of long-term distribution system planning and considering future time-of-use or demand response programs involving chargers.

Procurement Strategy

PE will conduct a request for information ("RFI") to identify EVSE vendors that offer Level 2 chargers, which are network-enabled to allow communication of interval data related to charging timing, frequency, and usage to PE. PE will then establish a list of qualified Level 2 chargers that will be accessible online to PE's customers. PE will also regularly update this list after the RFI to the extent additional vendors approach PE and can establish that their Level 2 chargers meet these specifications. The entity charged with administering the rebate program will be chosen through a request-for-proposal ("RFP") process.

Estimated Program Costs

PE will engage three full-time employees ("FTEs"), who will be charged with coordinating with the third-party administrator and EVSE vendors for both the residential and non-residential programs. All costs associated with the additional FTEs are included in the cost projections identified herein. The FTEs will focus on customer outreach and application processing; operational issues (e.g., charger planning and installation); and data acquisition and reporting.

PE projects the total costs for its residential program to be $3,096,733. The incentive budget reflects the rebate amounts to customers. The non-incentive budget includes program management, networking fees, education and customer outreach, and evaluation, measurement and verification costs. Below is PE's projected cost breakdown for the residential program:

	2019	**2020**	**2021**	**2022**	**2023**	**Total**
Incentive Budget	$ 83,000	$ 118,500	$ 184,500	$ 255,500	$ 358,500	$ 1,000,000
Non-Incentive Budget	$ 340,502	$ 366,498	$ 403,913	$ 455,623	$ 528,197	$ 2,096,733
Total Program Costs	$ 425,502	$ 484,998	$ 588,413	$ 711,123	$ 886,697	$ 3,096,733

Attachment C – Residential Sub-Portfolio

PE Program Offering #R1						
Program Offering	Level II Charging Station Rebate for Residential Service Locations					
Sub-portfolio	Residential					
Brief Description	The program would pay 50% of the purchase or upfront leasing costs, including installation costs, of a smart Level II charger (not to exceed $500) less any applicable state or federal rebates. Participating customers must agree to allow their chargers to communicate charging data to PE.					
Ownership Model	Rebate (site-host owned)					
EVSE Procurement Overview	PE will conduct an RFI to identify EVSE vendors that offer network-enabled Level II chargers. List of EVSE vendors that will qualify for rebate will be publicly posted and updated on a rolling basis.					
Cost to Participant	Pays 50% of the equipment and installation costs less any applicable rebates.					
	2019	**2020**	**2021**	**2022**	**2023**	**Total**
Incentive Budget	$83,000	$118,500	$184,500	$255,500	$ 358,500	$ 1,000,000
Non-Incentive Budget	$342,502	$366,498	$403,913	$455,623	$ 528,197	$ 2,096,733
Total Program Costs	$425,502	$484,998	$588,413	$711,123	$ 886,697	$ 3,096,733
Forecasted Measures - Level II	166	237	369	511	717	2,000
Objective of the Program Offering	•Encourage the adoption of electric vehicles by PE customers in recognition of the benefits of vehicle electrification and to advance state policy goals. •Evaluate charging behavior of residential customers at their homes. •Encourage the installation of smart Level II chargers so that EV customers can participate in PE's "next steps" offerings (e.g. load management and EV-only time varying rates).					
Evaluation metrics	•Frequency of daily charging at residential service location. •Length of charging at residential service location. •Timing of daily charging at residential service location.					
Evaluation plan	PE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date	Applications may be submitted beginning January 1, 2019. Rebates will be provided either until PE reaches the program limit of 2,000 rebates or until the program end date of December 31, 2023.					

D. Delmarva and Pepco Program Offering #R1: Discounted Level II Charging Stations and Incentive Rates

Delmarva and Pepco propose to incentivize the installation of Smart Level II charging stations for Residential Customers. A second metering device (AMI Meter) is required, which will facilitate off-peak charging through rate discounts offered as part of this program. PHI proposes to expand its popular EV-only Residential TOU tariff to Delmarva Maryland customers as well as additional Pepco Maryland customers. This program will test the effectiveness of a passive rate incentive on incentivizing customers to charge off-peak. Since the TOU rate is associated with just the car, all other load at the residence remains on its existing tariff. This allows for customers with third party suppliers, as well as those with NEM installations to participate. Customers who charge off-peak will receive significant annual savings on their EV charging costs.

Additionally, the Smart Level II charging stations incentivized by this program will automatically be incorporated into a Demand Response program that will reduce the output of the Level 2 chargers by 50% in concert with Peak Energy Savings Events. Customers will be able to opt out of the curtailment if they choose. Customers will get to select their charger from multiple pre-approved vendors and will be surveyed regarding participation and satisfaction of the program. Also, there exists the potential for volume discounts on charging stations. In addition, the Green Rider option for zero carbon charging will be available for this offering.

Incentive Amounts

- EV Customer: Pays 50% of the equipment costs and 50% of installation. Available 0% interest on bill financing for charger installation.

Eligibility Criteria

- The customer is a residential standard offer service customer, an alternative electricity supply customer, or a net energy meter customer of the utility who volunteers to participate.
- The customer agrees to allow the utility to manage the charger.
- The utility will gather the data from the customer (to the extent that smart grid access can be leveraged).
- The customer signs a customer participation agreement with the utility regarding the program's terms, conditions, and duration.
- The customer's EVSE will be located on customer-owned property, or in the case of rental property, the customer has obtained approval from the owner of record.
- The customer agrees to an electrical survey of the property prior to potential enrollment (to be paid for by the utility).
- In order to receive a level 2 smart EVSE, the customer must have at least one plug-in vehicle registered in Maryland with at least an electric range greater than 30 miles.
- The electric panel is in compliance with electrical standards and local jurisdictional codes.

- The existing electric panel has the capacity to support additional load (240 volts/32 amps) and the addition of a 40 amp circuit breaker in the panel.
- No additional electrical work inside the residence will be required in order to add an EVSE.
- The estimated distance from the customer's electrical panel or meter to the EVSE does not exceed 100 feet.
- The customer wants to purchase a smart level II EVSE and have it installed through this program offering.

Program Timeline

Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.

Program Metrics

The evaluation metrics by which the program will be evaluated include the number of residential customers that express interest in the offer, whether the qualified residential customers enrolled in EV-specific rate offerings, and whether the customers opted to pay their portion of the installation costs through the on-bill financing mechanism.

Procurement Strategy

PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple vendors and let the customers choose the equipment that gets installed.

Estimated Program Costs

The estimated program costs are $652,500 (Delmarva) and $1.65 million (Pepco). In the following templates for program offering #R1, the capital budget reflects the costs for: a new Smart Level II EVSE (50%); the EVSE installation (50%); the second meter (100%); the second meter installation (100%); and the premise assessment and inspection. The O&M budget reflects the program's allocation of billing, program management, system interfaces and updates, and analysis & reporting costs.

Attachment C – Residential Sub-Portfolio

Delmarva Program Offering #R1						
Program Offering	Level 2 Charging Stations					
Sub-portfolio	Residential					
Brief Description	The customer pays 50% of the Smart Level II charging station and 50% of the charger installation costs. The program would pay 50% of the Smart Level II charging station and 50% of the charger installation cost, as well as 100% of the cost of the second AMI meter and installation. PHI will reduce the output of these chargers by 50% to coincide with Peak Energy Savings Credit events. The customers can opt out of the demand response if they chose.					
Ownership Model	Discount (site-host owned)					
EVSE Procurement Overview	PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple vendors and let the customers choose the equipment that gets installed.					
Cost to Participant	Pays 50% of the equipment and installation costs less any applicable rebates.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 29,000	$ 86,000	$ 76,000	$ -	$ -	$ 191,000
O&M Budget[118]	$ 59,633	$ 112,300	$112,300	$ 81,133	$ 96,133	$ 461,500
Total Program Costs	$ 88,633	$ 198,300	$188,300	$ 81,133	$ 96,133	$ 652,500
Forecasted Measures - Level II	5	17	15	-	-	37
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering. •Customers who opted to pay their portion of the installation cost in installments.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[118] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment C – Residential Sub-Portfolio

Pepco Program Offering #R1						
Program Offering	Level 2 Charging Stations					
Sub-portfolio	Residential					
Brief Description	The customer pays 50% of the Smart Level II charging station and 50% of the charger installation cost. The program would pay 50% of the Smart Level II charging station and 50% of the charger installation cost, as well as 100% of the cost of the second AMI meter and installation. PHI will reduce the output of these chargers by 50% to coincide with Peak Energy Savings Credit events. The customers can opt out of the demand response if they chose.					
Ownership Model	Discount (site-host owned)					
EVSE Procurement Overview	PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple vendors and let the customers choose the equipment that gets installed.					
Cost to Participant	Pays 50% of the equipment and installation costs less any applicable rebates.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 77,000	$ 231,000	$205,000	$ -	$ -	$ 513,000
O&M Budge[119]t	$ 120,133	$ 284,133	$284,133	$ 218,633	$ 233,633	$ 1,140,667
Total Program Costs	$ 197,133	$ 515,133	$489,133	$ 218,633	$ 233,633	$ 1,653,667
Forecasted Measures - Level II	15	45	40	-	-	100
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering. •Customers who opted to pay their portion of the installation cost in installments.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[119] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

E. Delmarva and Pepco Program Offering #R2: Residential Smart Level II Charging Station Rebate (After Offering #R1 Closes)

Delmarva and Pepco propose to incentivize the installation of up to 1,000 Smart Level II charging stations for Residential Customers, following the close-out of the residential program offering #R1. Up to 1,000 Residential customers who purchase and install a level II charger will receive a maximum $500 rebate not to exceed 100% of the total charger and installation costs, less any applicable rebates. This offering allows the opportunity for Residential Customers to obtain a rebate towards the purchase and installation of a new level 2 charging station.

Incentive Amounts

- EV Customer: No direct cost to the Customer. The Customer receives a maximum $500 rebate not to exceed 100% of the total charger and installation costs, less any applicable rebates.

Eligibility Criteria

- Must demonstrate installation of a qualified level II smart charging station in order to receive the rebate.

Program Timeline

Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.

Program Metrics

The evaluation metrics by which the program will be evaluated include the number of residential customers that express interest in the offer, and whether qualified residential customers enroll in the offering.

Procurement Strategy

PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple vendors and let the customers choose the equipment that gets installed.

Estimated Program Costs

The estimated program costs are $188,000 (Delmarva) and $438,000 (Pepco). In the following templates for program offering #R2, the O&M budget reflects the costs of the program rebates, as well as the program's allocation of program management and analysis & reporting.

Delmarva Program Offering #R2						
Program Offering	Level 2 Charging Station Rebate					
Sub-portfolio	Residential					
Brief Description	Up to 250 customers who purchase and install a level II smart charger will receive a maximum $500 rebate not to exceed 100% of the total charger and installation costs, less any applicable rebates. NOTE: This offering commences after offering #R1 is satisfied.					
Ownership Model	Rebate (site-host owned)					
EVSE Procurement Overview	PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple chargers and provide the rebate upon proof of the installation of a qualified charger.					
Cost to Participant	No direct cost.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[120]	$ 4,800	$ 16,800	$ 41,800	$ 54,800	$ 69,800	$ 188,000
Total Program Costs	$ 4,800	$ 16,800	$ 41,800	$ 54,800	$ 69,800	$ 188,000
Forecasted Measures - Level II Rebates	0	0	50	100	100	250
Objective of the Program Offering	•Provides additional customer support opportunities for those who were not able to participate in Offering #R1.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in offering.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[120] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Pepco Program Offering #R2						
Program Offering	Level 2 Charging Station Rebate					
Sub-portfolio	Residential					
Brief Description	Up to 750 customers who purchase and install a level II smart charger will receive a maximum $500 rebate not to exceed 100% of the total charger and installation costs, less any applicable rebates. NOTE: This offering commences after offering #R1 is satisfied.					
Ownership Model	Rebate (site-host owned)					
EVSE Procurement Overview	PHI will develop specifications for the desired functionality of the Smart Chargers and will solicit the vendor community for compliance. Based on the responses, the Company will pre-qualify multiple chargers and provide the rebate upon proof of the installation of a qualified charger.					
Cost to Participant	No direct cost.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[121]	$ 4,800	$ 16,800	$ 91,800	$ 154,800	$ 169,800	$ 438,000
Total Program Costs	$ 4,800	$ 16,800	$ 91,800	$ 154,800	$ 169,800	$ 438,000
Forecasted Measures - Level II Rebates	0	0	150	300	300	750
Objective of the Program Offering	•Provides additional customer support opportunities for those who were not able to participate in Offering #R1.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in offering.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[121] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

F. Delmarva and Pepco Program Offering #R3: Residential FleetCarma Smart Device

PHI is proposing a wires-free incentive for residential customers to charge off-peak with its Fleetcarma offering. The Fleetcarma offering is a managed service that rewards customers for charging off-peak based on an in-vehicle data acquisition module that provides locational and consumption information from the vehicle itself. The device plugs into an EV through the existing On-Board Diagnostic Port and collects data on usage, location, time, and amount.

The purpose of this program is to test if customers can be encouraged to charge off-peak by means of a simple credit and without the need for a second AMI Meter at the premise. PHI will mimic the EV TOU benefits by crediting customers for charging off-peak at their place of residence while offering no penalty for non-compliance. This offering requires no additional utility AMI meter or billing system interfaces. PHI will evaluate the effectiveness of this method with the belief that, if successful, similar incentive programs can be created using data from the smart charger itself or another low-cost data source.

Incentive Amounts

- EV Customer: One-time initiation credit of $50. A $5 credit for each month the unit is plugged-in and active, plus rebates for off-peak charging. No direct cost to the Customer.

Eligibility Criteria

- The customer is a residential standard offer service customer, an alternative electricity supply customer, or a net energy meter customer of the utility who volunteers to participate.
- The customer signs a customer participation agreement with the utility regarding the program's terms, conditions, and duration.
- The customer must have an existing installed Level 2 EVSE.

Program Timeline

Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.

Program Metrics

The evaluation metrics by which the program will be evaluated include the number of residential customers that express interest in the offer and whether qualified residential customers enrolled in the offering.

Estimated Program Costs

The estimated program costs are $593,833 (Delmarva) and $1.43 million (Pepco). In the following templates for program offering #R3, the O&M budget reflects the costs of the program participation credits, administration, and reward and credit processing, as well as the program's allocation of program management, system interfaces and updates, and analysis & reporting.

Delmarva Program Offering #R3						
Program Offering	FleetCarma Smart Device					
Sub-portfolio	Residential					
Brief Description	The program would provide a complimentary FleetCarma smart device to customers with existing EVSE. Participants would receive a one-time initiation credit of $50 and a $5 credit for each month the unit is plugged-in and active. Chargers are not applicable to this offering.					
Ownership Model	Off-peak charging rebate and monthly credit					
EVSE Procurement Overview	N/A					
Cost to Participant	No direct cost to the participant.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[122]	$ 49,967	$ 146,300	$ 161,300	$ 125,133	$ 111,133	$ 593,833
Total Program Costs	$ 49,967	$ 146,300	$ 161,300	$ 125,133	$ 111,133	$ 593,833
Forecasted Measures - FleetCarma Smart Devices	2	8	12	11	4	37
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact. •Allows customers with existing non-smart EVSE to participate in a time-varying rate design option.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[122] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Pepco Program Offering #R3						
Program Offering	FleetCarma Smart Device					
Sub-portfolio	Residential					
Brief Description	The program would provide a complimentary FleetCarma smart device to customers with existing EVSE. Participants would receive a one-time initiation credit of $50 and a $5 credit for each month the unit is plugged-in and active. Chargers are not applicable to this offering.					
Ownership Model	Off-peak charging rebate and monthly credit					
EVSE Procurement Overview	N/A					
Cost to Participant	No direct cost to the participant.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[123]	$ 126,800	$ 351,133	$ 381,133	$ 308,633	$ 262,633	$ 1,430,333
Total Program Costs	$ 126,800	$ 351,133	$ 381,133	$ 308,633	$ 262,633	$ 1,430,333
Forecasted Measures - FleetCarma Smart Devices	5	22	33	30	10	100
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact. •Allows customers with existing non-smart EVSE to participate in a time-varying rate design option.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[123] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

G. Delmarva and Pepco Program Offering #R4: Whole-House Time-of-Use Rate for EV Residential Customers

Pepco commits to continuing the whole-house time-of-use ("TOU") rate currently available to owners of EVs, and Delmarva proposes to begin offering the whole-house TOU tariff to residential customers in its service territory. An unlimited number of Pepco and Delmarva Residential Customers may enroll to receive a discounted "whole house" rate that incentivizes those customers to charge during off-peak. One single meter to measure Customer's usage for both their residence and their vehicle (the customer's current meter would be re-programmed over the air to accommodate the set up.). Customers may opt out of this rate at any time with no penalty.

In the following templates for program offering #R4, the O&M budget reflects the program's allocation of billing, program management, and analysis & reporting costs.

Delmarva Program Offering #R4						
Program Offering	Whole House Time of Use Rate					
Sub-portfolio	Residential					
Brief Description	The program would provide discounted off-peak rate for both the vehicle and residence.					
Ownership Model	Off-peak rate discount					
EVSE Procurement Overview	N/A					
Cost to Participant	No direct cost to the participant.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[124]	$ 21,467	$ 16,800	$ 16,800	$ 4,800	$ 19,800	$ 79,667
Total Program Costs	$ 21,467	$ 16,800	$ 16,800	$ 4,800	$ 19,800	$ 79,667
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	This program offering is currently approved by the Commission as a permanent tariff. Future modifications, if any, will be brought to the Commission for review and approval.					

[124] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Pepco Program Offering #R4						
Program Offering	Whole House Time of Use Rate					
Sub-portfolio	Residential					
Brief Description	This program component is a continuation of an existing Pepco tariff. The program provides discounted off-peak rate for both the vehicle and residence.					
Ownership Model	Off-peak rate discount					
EVSE Procurement Overview	N/A					
Cost to Participant	No direct cost to the participant.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget						
O&M Budget[125]	$ 13,133	$ 16,800	$ 16,800	$ 4,800	$ 19,800	$ 71,333
Total Program Costs	$ 13,133	$ 16,800	$ 16,800	$ 4,800	$ 19,800	$ 71,333
Objective of the Program Offering	•Incentivizes off-peak charging. •Provides utility with insight into usage pattern data and grid impact.					
Evaluation metrics	•Number of residential customers that express interest. •Whether qualified residential customers enrolled in rate offering.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	This program offering is currently approved by the Commission as a permanent tariff. Future modifications, if any, will be brought to the Commission for review and approval.					

[125] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment D: Non-Residential Sub-Portfolio

Participating Utilities

BGE Program Offering #NR1, #NR2

PE Program Offering #NR1, #NR2

Delmarva Program Offering #NR1, #NR2, #NR3

Pepco Program Offering #NR1, #NR2, #NR3

Attachment D – Non-Residential Sub-Portfolio

A. BGE Program Offering #NR1: Non-Residential EV Charging Incentives

BGE proposes to offer its non-residential electric customers an incentive (in the form of a rebate check) to select and install advanced and controllable Level 2 ("L2") EV chargers or DC Fast Chargers ("DCFCs") at their workplace, multi-unit/multi-tenant dwelling ("MUD"), or for their vehicle fleet. The proposed incentives would be a monetary rebate issued by BGE in an amount up to 50% of the net cost of the project to purchase and install the EV charger at the desired location. The project cost amounts to which the rebate would apply would be the net project cost after applying all available grants from MEA and the federal government, as well as all other applicable incentives, grants, awards, and discounts. For example, if a total project cost is $5,000 without any incentives or rebates, but there is an available rebate from MEA in the amount of $700 and a local incentive in the amount of $500, the BGE rebate would be applied against a total net project cost of $3,800.

Incentive Amounts

- Rebate amounts capped at $5000/advanced L2 EV charger and $15,000/DCFC charger.
- Maximum award is $25,000/site and $60,000/fleet application.
- BGE proposes to review the incentive options for the MUD application component should MUD applications represent 250 chargers or less of the anticipated application target through 2020. If less than 250 chargers have been deployed as part of the MUD segment by 2020, BGE will review incentive levels and customer education and outreach targeting this market segment, and recommend for Commission approval new, more robust incentive levels and/or customer education and outreach efforts in coordination with the EV Portfolio Advisory Council to be implemented no later than 180 days after the Mid-course review.

Additional Non-Residential Incentives

In addition to the non-residential workplace/MUD/fleet EV charger incentives, BGE proposes to offer BGE's non-residential customers rebate incentives to build EV chargers at their facilities that are not workplace/MUD/fleet applications. These incentives would be up to 25% of the project costs, net of all available grants from MEA and the federal government, as well as all other applicable incentives, grants, awards, and discounts. Project costs could include only the EV charger, electrical equipment, electrical installation, and EV charger installation. Incentives would only be available for charging of on-road vehicles. Rebates would be capped at $2,500/L2 EV charger and $7,500/DCFC EV charger. Eligibility criteria would be the same as the workplace/MUD/fleet rebates.

Eligibility Criteria

- Customers must be able to remotely access charger's energy profile or report.
- Active or pending BGE non-residential account holder who installs or has installed an advanced L2 or DCFC EV charger at their workplace, MUD, or for their vehicle fleet during the incentive program period.

- L2 or DCFC EV charger must only serve the site host's charging needs (employees, tenants, residents, guests, or personal vehicle charging).
- L2 or DCFC EV charger must provide BGE customer with "smart" functionality such as the ability to view and analyze billing quality use data, and to remotely manage EV charger loads and demand.
    - To either remotely manage the charge loads and demand from the charger, or be integrated into a commercial building load management system of the building service to which the EV charger is connected.
    - Example eligible L2 EV chargers include the following:
        - ChargePoint CPF25
        - SemaConnect ChargePro
        - Blink L2 Pedestal EV Charger
        - AeroVironment Turbo Dock
    - Other vendors and products can be considered when sufficient documentation supporting the desired advanced functionality is provided to BGE.
- Account holder can select any EV charger vendor and installation contractor so long as the EV charger functionality requirements are met.

Program Timeline

- The proposed program would begin in 2018 and run for five years, through 2022.
- BGE would begin taking rebate applications upon Commission program approval.
- BGE would accept completed applications with supporting paperwork received by November 30, 2022 (in order to process and issue rebate checks no later than December 31, 2022).

Program Metrics

- Applications by year
- Number of potential EV chargers installed
- Incentives paid
- Administrative costs
- Number of EV chargers installed (L1, L2, DCFC, other)

Procurement Strategy

BGE will publicly post a list of minimum requirements for EVSEs eligible to receive an incentive through this program. The customer will purchase the EVSE and work with an installation contractor. After completion of the work, the customer will submit documents to BGE for Incentive Award.

Estimated Program Units and Costs

BGE estimates the following regarding the number of rebate incentives paid and the corresponding program costs over the life of the program (2018-2022):

Attachment D – Non-Residential Sub-Portfolio

Non-Residential						
	2018	2019	2020	2021	2022	Rounded Totals
Chargers	200	275	375	510	605	1965
MUDs	90	100	130	180	200	700
Workplace	80	125	165	220	260	850
Other	30	40	60	80	95	305
Fleet	0	10	20	30	50	110
Incentives	$1,110,000	$1,530,000	$2,070,000	$2,820,000	$3,345,000	$10,875,000
Education	$88,268	$121,667	$164,608	$224,249	$265,997	$864,788
Nescaum	$45,304	$45,304	$45,304	$45,304	$45,304	$226,520
Admin	$26,558	$36,607	$49,527	$67,472	$80,033	$260,198
EMV	$11,175	$15,403	$20,839	$28,390	$33,675	$109,481
Deployment	$180,216	$248,406	$336,078	$457,846	$543,083	$1,765,630
Annual Sums	$1,461,521	$1,997,387	$2,686,357	$3,643,260	$4,313,092	$14,101,617

*Annual sums include incentives, education and program administration costs.
**Annual EV charger count/application is an estimate. Actuals could vary.

As noted above, BGE plans on awarding 1,965 rebates over the five-year lifespan of the program. The total program cost will be just over $14 million. The final count of total chargers installed will vary based on the number of Level 2 and DC Fast Charge Units applied for.

BGE Program Offering #NR1						
Program Offering	Level 2 and DCFC Smart Charging Stations for Non-Residential					
Sub-portfolio	Non-Residential					
Brief Description	Propose to offer BGE's customers incentives to choose and install advanced and controllable L2 and DC Fast Chargers at their Fleet, Workplace, and MUDs. BGE proposes to provide an incentive of up to 50% of the cost of the project, where costs are net of MEA, other applicable incentives, grants, awards, and discounts. BGE also proposes to provide an incentive of up 25% of the cost of the project, net of other incentives, for Non-Residential Other, including public facing charging installations.					
Ownership Model	Rebate					
EVSE Procurement Overview	BGE to list minimum requirements. Customer Purchases EVSE and Installation Contractor. After completion of work, customer submits documents to BGE for Incentive Award.					
Cost to Participant	Project Costs include Charging Station, Electrical Equipment, Electrical Installation, and Charger Installation. Customer submits to MEA for 40%-50% Rebate (capped at $4,000 for L2 and up to $55,000 for DCFC) and then submits to BGE for 50% rebate on remainder (capped at $5,000 for L2 and $15,000 for DCFC). The Non-Residential Other options will be incentivized at 25% rebate on the remainder (capped at $2,500 for L2 and $7,500 for DCFC). Maximum award is $25,000 per site and $60,000 for fleet applications. Maximum award is $12,500 per site for Non-Res Other category. Individual Incentives and overall budget can shift +/- 10% based on program success					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Incentive Budget[126]	$1,125,000	$1,500,000	$2,055,000	$2,790,000	$3,405,000	$10,875,000
Non-Incentive Budget[127]	$351,521	$467,387	$616,357	$823,260	$968,092	$3,226,617
Total Program Costs	$1,461,521	$1,997,387	$2,686,357	$3,643,260	$4,313,092	$14,101,617
Forecasted Measures-MUDs	90	100	130	180	200	700
Forecasted Measures-Workplace	80	125	165	220	260	850
Forecasted Measures-Public Facing	30	40	60	80	95	305

[126] The incentive budget reflects the rebate amounts to customers.
[127] The non-incentive budget reflects customer education and outreach (including NESCAUM), program administration, program deployment, and evaluation, measurement and verification costs.

Forecasted Measures- Fleet	0	10	20	30	50	110
Forecasted Measures- Sum	200	275	375	510	605	1,965
Objective of the Program Offering	Incent charger installations at: Multi-unit properties (residential and non-residential) to increase charging access for residents, tenants and guests. Workplaces (for employees and fleets) to expand the core of infrastructure and EV interest. Non-Residential Other to allow for growth of the whole EVSE Market and provide more public options for EV users.					
Evaluation metrics	Applications by year Number of potential chargers installed Incentives paid Admin costs Number of chargers installed					
Evaluation plan	BGE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Start (best estimate pending PSC approval) – accept applications starting July 2018, close out by December 2022					

B. BGE Program Offering #NR2: Demand Charge Credit

BGE proposes to provide a bill credit to demand billed non-residential customers who install EV chargers for their workplace or fleet use. The credit would be for a portion of the maximum distribution demand resulting from the addition of EV chargers to the facility service and metered load. Credits would be determined based on 50% of the maximum (nameplate capacity) for new or added L2 (240 V ac) charging, and 50% of the maximum nameplate capacity for DCFC equipment. The credit will be a fixed amount, based on BGE's calculations, and would be applied to the customer's monthly BGE bills for the facility where the EV chargers are sited. BGE will provide the credit for up to 30 months, or the end of December 2022, whichever comes first, following acceptance of documentation and approval of the completed work.

Credit Availability/Timing

Bill credits would be available from July 1, 2018 through December 31, 2022. Applications would be accepted starting July 1, 2018. Credits would be posted to bills for 30 months or through the end of December 2022, whichever comes first, following approval of completed documentation for the customer's EV charger installation. No new applications would be accepted after October 30, 2020, and all project completion documentation would have to be submitted to BGE by December 31, 2020.

Sample Tariff

On the following page is a sample tariff for the proposed demand charge credit.

XX. Electric Vehicle Charging Demand Credit (Sample Tariff)

Upon application by the Customer and approval by the Company, qualifying non-residential customers who have installed an Electric Vehicle (EV) charging station for a workplace or fleet use, may be eligible to receive a credit to partially offset their monthly distribution demand charge. This Rider is available to non-residential customers on Schedules GL and P that intend to use the EV Charging system for a workplace or fleet use.

The Customer is responsible to submit an application and documentation of the completed EV Charging station installation to the Company in order to become eligible for the demand credit. The Company will determine acceptance, calculate the demand credit amount and communicate these results to the Customer.

Demand Credit Structure

EV Charging Station Type	Maximum Credit	Credit Length
Level 2 Charging Station	50% Nameplate Capacity	30 months or through the end of December 2022, whichever comes first
DC Fast Charging Station	50% Nameplate Capacity	30 months or through the end of December 2022, whichever comes first

Demand credits are applied to the Customer's bill only for a portion of the maximum distribution demand charge resulting from the addition of EV chargers to the Customers' facility service and metered load. These demand credits would be determined based on 50% of the maximum nameplate capacity for new or added L2 EV charging stations and/or DC Fast EV charging stations.

Application submission and demand credit availability will begin on July 1, 2018 and terminate on December 31, 2020. The demand credit will be a fixed amount, calculated by the Company and applied to the customers' monthly bills for the account with the installed and operational L2 or DC Fast EV charging station. The maximum allowable term for the demand charge credit is 30 months or through the end of December 2022, whichever comes first, from the date of documentation acceptance and approval for the completed work of the EV charging station. No new applications will be accepted after October 30, 2020, and all project completion documentation must be submitted to the Company by December 31, 2020.

The Company will report to Commission Staff on the use of this Rider annually.

C. PE Program Offering #NR1: Level 2 Charger Installation at Commercial/Industrial Service Locations

At commercial and industrial ("C&I") service locations, PE customers may apply to have the Company install an EVSE at their service location, subject to certain eligibility criteria discussed further below. This program will include the installation of up to 150 dual port AC Level 2 chargers at C&I locations.

Once a customer is selected for participation in the C&I program, PE will work with the customer to determine a location for the charger. The Level 2 charger may either be located behind the customer's current service meter or at a separately-metered new service location. Up to 50% of all non-residential Level 2 chargers may be located behind the customer's current service meter. All other chargers will be located at separately-metered service locations. At a single site, the customer is limited to either a behind the current meter charging location or a new separately-metered charging location, not both. PE will honor the customer's preference for charger location, unless the customer's preference would result in unreasonable distribution upgrades or other costs, or after PE has met the 50% cap identified above.

Incentive Amounts

If installed behind the meter for the service location, the owner of the service location will be responsible for installing the conduit and wiring from the customer's service panel to the charger. PE will provide a reimbursement for the wiring installation costs of up to $2,000. PE will be the owner of the charger, while the owner of the service location will be the owner of the wiring from the service panel to the charger. Operational decisions related to the charger may be made by the owner of the service location. The customer may choose to offer free charging to EV users or to offer the charging at a price to EV users. The price to users may be chosen by the customer, with input from PE and the customer's EVSE network provider to the extent necessary. All electricity delivered to the charger will be charged at the rate schedule for the service location as part of the owner's monthly service bill from PE.

If the Level 2 charger is installed behind a separately-metered new service location, the owner will simply host the charger without any involvement in terms of vendor selection or charging pricing. At the separately-metered service locations, PE will own and operate all infrastructure, including the charger. In addition, EV users will be charged PE's EV rate based on the embedded metrology of the charger, at a rate of $0.15/kWh plus a $2.00 wake up fee per charge.[128] Any revenues exceeding the standard retail tariff charge for the separately-metered service location will be credited back to customers via the surcharge rider, thereby lowering the cost impact on customers. PE will seek approval from the Commission's engineering group of the embedded metrology within each EVSE hardware type as a sub-meter under the Commission's regulations.

[128] The EV rate for Level 2 chargers may be adjusted during the program to ensure the rate is representative of market prices.

Eligibility Criteria

PE will make a final determination regarding whether customers are admitted to the program based on a combination of a first-come, first-serve approach and the following pass/fail grading factors:

- proximity of the proposed EVSE to other chargers in the area, *i.e.* the fewer local chargers, the more likely the application will be selected;
- proximity of the EVSE to NREL "hot spot" locations, *i.e.* the closer the charger would be located to identified "hot spots" for chargers that currently have insufficient charging options, the more likely the application will be selected;
- number of likely users of the charger, *i.e.* the more possible users, the more likely the application will be selected;
- likelihood that a charger would be adopted at the service location, but for the pilot program, *i.e.* if there are reasons that decrease the likelihood of a charger being installed at the location, the more likely the application will be selected;
- length of time users are likely to be at the location, *i.e.* if users are likely to be at the location for sufficient time to provide a reasonable level of charge to their EV, the more likely the application will be chosen; and
- distribution planning implications at the location, *i.e.* if the distribution system planning implications result in fewer costs, the more likely the application will be chosen.

Program Timeline

Applications may be submitted by PE customers beginning January 1, 2019. Charger installation will conclude after the installation of 150 chargers or by December 31, 2023, when the program is scheduled to conclude.

Program Metrics

PE is looking to achieve two different objectives in the siting of the charging infrastructure. First and foremost, PE will focus on establishing a baseline level of EVSE infrastructure in its service territory.[129] At the same time, however, PE will try to identify locations for charger installation that, without this Pilot Program, would otherwise be unlikely to have EVSE infrastructure installed. PE will strive to balance each of these objectives in its implementation of the commercial and industrial program.

Metrics by which PE will evaluate the commercial and industrial program include: frequency of daily charging at the service location; length of charging at the service location; timing of daily charging at the service location; the usage and demand associated with each charge; the number of daily charger users by service location type; and the charging pricing methodology

[129] Current EVSE infrastructure maps indicate that there is a dearth of charging infrastructure in PE's service territory.

Procurement Strategy

PE will issue an RFP to choose one or more EVSE network providers, EVSE hardware providers, installers and electricians, and entities who will handle day-to-day application processing, data acquisition, and customer outreach and education. PE will require that all EVSE hardware be network-enabled in order to track and communicate interval charging data to PE, including the charging timing, frequency, and usage. To the extent multiple EVSE vendors are selected, customers who choose to install the Level 2 charger behind their service meter will have the option of choosing their own EVSE network and hardware vendors, or they can request that PE choose these vendors on their behalf. Where PE is asked to assign vendors or where the charger is located behind a separately-metered service location, PE will use a "round robin" approach in an effort to promote equitable EVSE involvement in the program. Each EVSE network provider must agree to release interval charging data to PE, including the usage, demand, frequency, length, start and end times of daily charging, and the charging price per user. The EVSE network providers will communicate this data to PE, who will report this data to the Commission on a semi-annual basis.

Estimated Program Costs

The costs associated with the commercial and industrial program are projected to be $4,558,335, broken down as follows:

	2019	**2020**	**2021**	**2022**	**2023**	**Total**
O&M	$350,939	$405,861	$455,807	$510,728	$ 565,650	$2,288,985
Capital	$453,870	$453,870	$453,870	$453,870	$ 453,870	$2,269,350
Total Program Costs	$804,809	$859,731	$909,677	$964,598	$1,019,520	$4,558,335

The capital budget reflects the charger unit, installation, wiring installation (where applicable), electrical upgrades, and engineering review costs. The O&M budget reflects the program management, maintenance agreement, service plan, networking fees, property tax, wiring installation rebate (where applicable), evaluation, measurement, and verification, and education and customer outreach costs.

Attachment D – Non-Residential Sub-Portfolio

PE Program Offering #NR1						
Program Offering	Level 2 Charger Installation at Commercial/Industrial Service Locations					
Sub-portfolio	Non-Residential					
Brief Description	PE will install up to 150 chargers at commercial and industrial service locations. PE will own and operate the chargers.					
Ownership Model	Utility-owned/operated					
EVSE Procurement Overview	Request-for-proposal process					
Cost to Participant	Wiring and installation costs exceeding $2,000 where the charger is installed behind the current meter; no costs where the charger is installed at a separately-metered service location.					
	2019	**2020**	**2021**	**2022**	**2023**	**Total**
Capital	$453,870	$453,870	$453,870	$453,870	$ 453,870	$2,269,350
O&M	$350,939	$405,861	$455,807	$510,728	$ 565,650	$2,288,985
Total Program Costs	$804,809	$859,731	$909,677	$964,598	$1,019,520	$4,558,335
Forecasted Measures - Level II	30	30	30	30	30	150
Objective of the Program Offering	•Encourage the adoption of electric vehicles by providing access to charging infrastructure in commercial and industrial locations. •Evaluate charging behavior of EV users at commercial and industrial locations.					
Evaluation metrics	•Frequency of daily charging at the service location. •Length of charging at the service location. •Timing of daily charging at the service location. •The usage and demand associated with each charge. •The number of daily charger users by service location type. •The charging pricing methodology.					
Evaluation plan	PE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics above.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications may be submitted beginning January 1, 2019. Charger installation will conclude after the installation of 150 chargers or by December 31, 2023, when the program is scheduled to conclude.					

D. PE Program Offering #NR2: Level II Charger Installation at Multifamily Service Locations

At multifamily service locations, PE customers may apply to have the Company install an EVSE at their service location, subject to certain eligibility criteria discussed further below. This program will include the installation of up to 50 dual port AC Level 2 chargers at multifamily locations, and reserve 15 Level 2 chargers for multifamily housing buildings where 50% or more of the residents are confirmed low-income customers.[130]

Once a customer is selected for participation in the multifamily program, PE will work with the customer to determine a location for the charger. The Level 2 charger may either be located behind the customer's current service meter or at a separately-metered new service location. Up to 50% of all Level 2 chargers may be located behind the customer's current service meter. At a single site, the customer is limited to either a behind the current meter charging location or a new separately-metered charging location, not both. All other chargers will be located at separately-metered service locations. PE will honor the customer's preference for charger location, unless the customer's preference would result in unreasonable distribution upgrades or other costs, or after PE has met the 50% cap identified above.

Incentive Amounts

If installed behind the meter for the service location, the owner of the service location will be responsible for installing the conduit and wiring from the customer's service panel to the charger. PE will provide a reimbursement for the wiring installation costs of up to $2,000. PE will be the owner of the charger, while the owner of the service location will be the owner of the wiring from the service panel to the charger. Operational decisions related to the charger may be made by the owner of the service location. The customer may choose to offer free charging to EV users or to offer the charging at a price to EV users. The price to users may be chosen by the customer, with input from PE and the customer's EVSE network provider to the extent necessary. All electricity delivered to the charger will be charged at the rate schedule for the service location as part of the owner's monthly service bill from PE.

If the Level 2 charger is installed behind a separately-metered new service location, the owner will simply host the charger without any involvement in terms of vendor selection or charging pricing. At the separately-metered service locations, PE will own and operate all infrastructure, including the charger. In addition, EV users will be charged PE's EV rate based on the embedded metrology of the charger, at a rate of $0.15/kWh plus a $2.00 wake up fee per charge.[131] Any revenues exceeding the standard retail tariff charge for the separately-metered service location will be credited back to customers via the surcharge rider, thereby lowering the

[130] For purposes of this program, "confirmed low-income" applies to customer at or below 200% of the federal poverty income guidelines. PE will work with the owner of the service location to determine whether the building qualifies as "confirmed low-income" for purposes of this program. If customers are individually metered, PE will use its own records to assist in determining if the building meets the low-income qualification. If the building is master-metered, PE will rely on the owner to supply information related to the residents to allow PE to determine if the building should qualify.

[131] The EV rate for Level 2 chargers may be adjusted during the program to ensure the rate is representative of market prices.

cost impact on customers. PE will seek approval from the Commission's engineering group of the embedded metrology within each EVSE hardware type as a sub-meter under the Commission's regulations.

Eligibility Criteria

Applicants for this program will be chosen by PE based on the following factors:

- proximity of the proposed EVSE to other chargers in the area;
- proximity of the EVSE to NREL "hot spot" locations;
- number of likely users of the charger;
- likelihood that a charger would be adopted at the service location, but for the pilot program;
- length of time users are likely to be at the location; and
- distribution planning implications at the location.

Program Timeline

Applications may be submitted by PE customers beginning January 1, 2019. The installation of charging stations will conclude after the installation of 50 chargers or by December 31, 2023, when the program concludes.

Program Metrics

PE is looking to achieve two different objectives in the siting of the charging infrastructure. First and foremost, PE will focus on establishing a baseline level of EVSE infrastructure in its service territory.[132] At the same time, however, PE will try to identify locations for charger installation that, without this Pilot Program, would otherwise be unlikely to have EVSE infrastructure installed, such as at confirmed low-income multifamily housing units. PE will strive to balance each of these objectives in its implementation of the multifamily program.

Metrics by which PE will evaluate the multifamily program include: frequency of daily charging at the service location; length of charging at the service location; timing of daily charging at the service location; the usage and demand associated with each charge; the number of daily charger users by service location type; and the charging pricing methodology

Procurement Strategy

PE will issue an RFP to choose one or more EVSE network providers, EVSE hardware providers, installers and electricians, and entities who will handle day-to-day application processing, data acquisition, and customer outreach and education. PE will require that all EVSE hardware be network-enabled in order to track and communicate interval charging data to PE, including the charging timing, frequency, and usage. To the extent multiple EVSE vendors are selected, customers who choose to install the Level 2 charger behind their service meter will have the option of choosing their own EVSE network and hardware vendors, or they can request

[132] Current EVSE infrastructure maps indicate that there is a dearth of charging infrastructure in PE's service territory.

that PE choose these vendors on their behalf. Where PE is asked to assign vendors or where the charger is located behind a separately-metered service location, PE will use a "round robin" approach in an effort to promote equitable EVSE involvement in the program. Each EVSE network provider must agree to release interval charging data to PE, including the usage, demand, frequency, length, start and end times of daily charging, and the charging price per user. The EVSE network providers will communicate this data to PE, who will report this data to the Commission on a semi-annual basis.

Estimated Program Costs

The costs associated with the multifamily program are projected to be $1,535,756, broken down as follows:

	2019	**2020**	**2021**	**2022**	**2023**	**Total**
O&M	$ 120,242	$138,549	$155,198	$173,505	$ 191,812	$ 779,306
Capital	$ 151,290	$151,290	$151,290	$151,290	$ 151,290	$ 756,450
Total Program Costs	$ 271,532	$289,839	$306,488	$324,795	$ 343,102	$ 1,535,756

The capital budget reflects the charger unit, installation, wiring installation (where applicable), electrical upgrades, and engineering review costs. The O&M budget reflects the program management, maintenance agreement, service plan, networking fees, property tax, wiring installation rebate (where applicable), evaluation, measurement, and verification, and education and customer outreach costs.

Attachment D – Non-Residential Sub-Portfolio

PE Program Offering #NR2						
Program Offering	Level 2 Charger Installation at Multifamily Service Locations					
Sub-portfolio	Residential					
Brief Description	PE will install up to 50 chargers at multifamily service locations, with 15 of the chargers reserved for service locations where 50% or more of the building residents are confirmed low-income customers. PE will own and operate the chargers.					
Ownership Model	Utility-owned/operated					
EVSE Procurement Overview	Request-for-proposal process					
Cost to Participant	Wiring and installation costs exceeding $2,000 where the charger is installed behind the current meter; no costs where the charger is installed at a separately-metered service location.					
	2019	**2020**	**2021**	**2022**	**2023**	**Total**
Capital	$ 151,290	$151,290	$151,290	$151,290	$ 151,290	$ 756,450
O&M	$ 120,242	$138,549	$155,198	$173,505	$ 191,812	$ 779,306
Total Program Costs	$ 271,532	$289,839	$306,488	$324,795	$ 343,102	$ 1,535,756
Forecasted Measures - Level II	10	10	10	10	10	50
Objective of the Program Offering	•Encourage the adoption of electric vehicles by providing access to charging infrastructure, including within underserved areas. •Evaluate charging behavior of EV users at multifamily locations.					
Evaluation metrics	•Frequency of daily charging at the service location. •Length of charging at the service location. •Timing of daily charging at the service location. •The usage and demand associated with each charge. •The number of daily charger users by service location type. •The charging pricing methodology.					
Evaluation plan	PE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications may be submitted beginning January 1, 2019. Charger installation will conclude after the installation of 50 chargers or by December 31, 2023, when the program concludes.					

E. Delmarva and Pepco Program Offering #NR1: Level II Charging Stations for Workplace Charging

This program anticipates the installation of up to 906 Smart Level II charging stations for owners/operators of office buildings and garages. Pepco and Delmarva will use NREL data to establish targets of opportunities. The program would pay 50% of the Smart Level II charging station and the customer would pay the associated charger installation cost. As a Technology Demonstration, EV Charging could be varied to support PJM Frequency Response needs, which is a program described and included in the subsequent section detailing the Technology Sub-Portfolio. In addition, the Green Rider option for zero tailpipe emissions could be explored for this offering.

Incentive Amounts

Participating EV Customers will receive 50% of the smart level II charging station equipment costs covered through the program.

Eligibility Criteria

- The customer agrees to allow the utility to manage the charger for demand response purposes.
- The utility will gather the data from the customer (to the extent that smart grid access can be leveraged).
- The customer signs a customer participation agreement with the utility regarding the program's terms, conditions, and duration.
- The customer's EVSE will be located on customer-owned property, or in the case of rental property, the customer has obtained approval from the owner of record.
- The customer agrees to an electrical survey of the property prior to potential enrollment (to be paid for by the utility).
- The electric panel is in compliance with electrical standards and local jurisdictional codes.
- The existing electric panel has the capacity to support additional load (240 volts/32 amps) and the addition of a 40 amp circuit breaker in the panel.
- The customer wants to purchase a smart level II EVSE through this program offering.

Program Timeline

For charging stations incentivized by this program, applications must be received by November 1, 2022, with all incentives paid out by December 31, 2022.

Program Metrics

The metrics by which the program will be evaluated include the number of workplaces that express interest; whether the approved installations overlap with NREL-identified demand hot spots; whether any grid upgrades were triggered by the EVSE installation; and whether workplaces enrolled in an EV-specific rate offering. The utility will conduct periodic surveys to gauge participant satisfaction

Procurement Strategy

PHI intends to issue a request for proposals to procure a diverse EVSE vendor pool. Multiple EVSE vendors will be pre-qualified for participation in the program, and the utility will make every effort to divide the charging stations among qualified EVSE vendors.

Estimated Program Costs

The estimated program costs associated with the public charging stations in neighborhoods program are: $1.5 million (Delmarva) and $4 million (Pepco). In the following templates for program offering #NR1, the O&M budget reflects the costs of the second meter installation and the facility assessment, as well as the program's allocation of billing, program management, system interfaces and updates, and analysis & reporting costs. The capital budget reflects the costs (50%) of a new Smart Level 2 EVSE and payment module, and the cost of a second meter.

Delmarva Offering #NR1						
Program Offering	Level 2 Charging Stations for Workplaces					
Sub-portfolio	Non-residential					
Brief Description	The program would pay 50% of the Smart Level II charging station and 0% of the charger installation cost, net of any available State or local incentives.					
Ownership Model	Discount					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. In most cases, the site owners will be able to select their technology from qualified vendors. For Demand Response technology demonstrations, the Utility may select the technology and will make every effort to divide the chargers among qualified vendors.					
Cost to Participant	Pays 50% of the equipment costs and 100% of installation cost.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 52,000	$ 233,000	$ 337,000	$ 207,000	$ 207,000	$ 1,036,000
O&M Budget[133]	$ 59,633	$ 112,300	$ 112,300	$ 81,133	$ 96,133	$ 461,500
Total Program Costs	$111,633	$ 345,300	$ 449,300	$ 288,133	$ 303,133	$ 1,497,500
Forecasted Measures - Level II	12	54	77	48	48	239
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various workplaces. •Provide seamless customer experience for the chargers. •Obtain separate vendor to administer transactions for various vendor participants. •Develop demand charge rider that will help to mitigate demand charges.					
Evaluation metrics	•Number of workplaces that express interest. •Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation. •Will conduct periodic surveys to gauge participant satisfaction. •Whether workplaces enrolled in EV-specific rate offering.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[133] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment D – Non-Residential Sub-Portfolio

Pepco Offering #NR1						
Program Offering	Level 2 Charging Stations for Workplaces					
Sub-portfolio	Non-residential					
Brief Description	The program would pay 50% of the Smart Level II charging station and 0% of the charger installation cost, net of any available State or local incentives.					
Ownership Model	Discount					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. In most cases, the site owner will be able to select their technology from qualified vendors. For Demand Response technology demonstrations, the Utility may select the technology and will make every effort to divide the chargers among qualified vendors.					
Cost to Participant	Pays 50% of the equipment costs and 100% of installation cost.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 143,000	$ 644,000	$ 930,000	$ 572,000	$ 572,000	$ 2,861,000
O&M Budget[134]	$ 120,133	$ 284,133	$ 284,133	$ 218,633	$ 233,633	$ 1,140,667
Total Program Costs	$ 263,133	$ 928,133	$1,214,133	$ 790,633	$ 805,633	$ 4,001,667
Forecasted Measures - Level II	34	150	217	133	133	667
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various workplaces. •Provide seamless customer experience for the chargers. •Obtain separate vendor to administer transactions for various vendor participants. •Develop demand charge rider that will help to mitigate demand charges.					
Evaluation metrics	•Number of workplaces that express interest. •Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation. •Will conduct periodic surveys to gauge participant satisfaction. •Whether workplaces enrolled in EV-specific rate offering.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[134] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

F. Delmarva and Pepco Program Offering #NR2: Level II Charging Stations for Multi-Unit Dwellings

This program anticipates the installation of up to 250 Smart Level II charging stations for owners/operators of multi-unit dwelling facilities. The program would pay 50% of the Smart Level II charging station and 100% of the charger installation cost, not to exceed 100% of the total installation costs less any applicable rebates. Both Pepco and DPL will use NREL data to establish targets of opportunities. Also, an off-peak incentive rate, SGS ND-PIV, will be provided to participants. In addition, the Green Rider option for zero tailpipe emissions may be offered.

Incentive Amounts

Participating EV Customers will receive 50% of the smart level II charging station equipment costs covered through the program, and 100% of installation cost (not to exceed 100% of the total installation costs less any applicable rebates).

Eligibility Criteria

- The customer is a multi-residential Standard Offer Service customer of the utility, a multi-residential net energy meter customer, or is a multi-residential alternative electricity supply customer, who volunteers to participate in the program.
- The customer agrees to allow the utility to manage the charger.
- The utility will gather the data from the customer (to the extent that smart grid access can be leveraged).
- The customer signs a customer participation agreement with the utility regarding the program's terms, conditions, and duration.
- The customer's EVSE will be located on customer-owned property, or in the case of rental property, the customer has obtained approval from the owner of record.
- The customer agrees to an electrical survey of the property prior to potential enrollment (to be paid for by the utility).
- In order to receive a level 2 smart EVSE, the customer must have at least one resident/tenant who is interested in owning or leasing a plug-in vehicle registered in Maryland with at least an electric range greater than 30 miles.
- The electric panel is in compliance with electrical standards and local jurisdictional codes.
- The existing electric panel has the capacity to support additional load (240 volts/32 amps) and the addition of a 40-amp circuit breaker in the panel.
- The customer wants to purchase a smart level II EVSE through this program offering.

Program Timeline

For charging stations incentivized by this program, applications must be received by November 1, 2022, with all incentives paid out by December 31, 2022.

Program Metrics

The metrics by which the program will be evaluated include the number of multifamily dwellings that express interest; whether the approved installations overlap with NREL-identified demand hot spots; whether any grid upgrades were triggered by EVSE installation; and whether the multi-family dwelling enrolled in an EV-specific rate offering.

Procurement Strategy

PHI intends to issue a request for proposals to procure a diverse EVSE vendor pool. Multiple EVSE vendors will be pre-qualified for participation in the program, and the utility will make every effort to divide the charging stations among qualified EVSE vendors.

Estimated Program Costs

The estimated program costs associated with the public charging stations in neighborhoods program are: $1.1 million (Delmarva) and $3.5 million (Pepco). In the following templates for program offering #NR2, the O&M budget reflects the program's allocation of billing, program management, system interfaces and updates, and analysis & reporting costs. The capital budget reflects the costs (50%) of a new Smart Level 2 EVSE and payment module, the costs associated with the EVSE installation and inspection, the cost of a separate meter, the costs of a separate meter installation, and a facility assessment.

Delmarva Offering #NR2						
Program Offering	Level 2 Charging Stations for Multi-Unit Dwellings					
Sub-portfolio	Non-residential					
Brief Description	The program would pay 50% of the Smart Level II charging station and 100% of the charger installation cost, not to exceed 100% of the total installation costs less any applicable rebates.					
Ownership Model	Make-ready + Discount					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation.					
Cost to Participant	Pays 50% of the equipment costs and 0% of installation cost (not to exceed 100% of the total installation costs less any applicable rebates.)					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 119,000	$ 298,000	$ 179,000	$ -	$ -	$ 596,000
O&M Budget[135]	$ 59,633	$ 112,300	$ 112,300	$ 81,133	$ 96,133	$ 461,500
Total Program Costs	$ 178,633	$ 410,300	$ 291,300	$ 81,133	$ 96,133	$ 1,057,500
Forecasted Measures - Level II	10	25	15	-	-	50
Objective of the Program Offering	•Facilitate and encourage equitable access to benefits derived from vehicle, especially in underserved market segments. •Expand charging capabilities to apartment/condo customers. •Develop demand charge rider that will help to mitigate demand charges. •Gain a better understanding of challenges experienced in this underserved area. •Monitor charger utilization.					
Evaluation metrics	•Number of multifamily dwellings that express interest. •Whether the approved installations overlap with NREL-identified demand hot spot. •whether any grid upgrades were triggered by EVSE installation. •whether MUD enrolled in EV-specific rate offering					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[135] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Pepco Offering #NR2						
Program Offering	Level 2 Charging Stations for Multi-Unit Dwellings					
Sub-portfolio	Non-residential					
Brief Description	The program would pay 50% of the Smart Level II charging station and 100% of the charger installation cost, not to exceed 100% of the total installation costs less any applicable rebates.					
Ownership Model	Make-ready + Discount					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation.					
Cost to Participant	Pays 50% of the equipment costs and 0% of installation cost (not to exceed 100% of the total installation costs less any applicable rebates.)					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 474,000	$ 1,185,000	$ 711,000	$ -	$ -	$ 2,370,000
O&M Budget[136]	$ 120,133	$ 284,133	$ 284,133	$ 218,633	$ 233,633	$ 1,140,667
Total Program Costs	$ 594,133	$ 1,469,133	$ 995,133	$ 218,633	$ 233,633	$ 3,510,667
Forecasted Measures - Level II	40	100	60	-	-	200
Objective of the Program Offering	•Facilitate and encourage equitable access to benefits derived from vehicle, especially in underserved market segments. •Expand charging capabilities to apartment/condo customers. •Develop demand charge rider that will help to mitigate demand charges. •Gain a better understanding of challenges experienced in this underserved area. •Monitor charger utilization.					
Evaluation metrics	•Number of multifamily dwellings that express interest. •Whether the approved installations overlap with NREL-identified demand hot spot. •whether any grid upgrades were triggered by EVSE installation. •whether MUD enrolled in EV-specific rate offering					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications must be received by November 1, 2022 with all incentives paid out by December 31, 2022.					

[136] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

G. Pepco / Delmarva Program Offering #NR3: Demand Charge Credit

Pepco and Delmarva propose to provide a bill credit to demand billed non-residential customers who install EV chargers for their workplace or fleet use. The credit would be for a portion of the maximum distribution demand resulting from the addition of EV chargers to the facility service and metered load. Credits would be determined based on 50% of the maximum (nameplate capacity) for new or added L2 (240 V ac) charging, and 50% of the maximum nameplate capacity for DCFC equipment. The credit will be a fixed amount, based on the Company's calculations, and would be applied to the customer's monthly Pepco and Delmarva bills for the facility where the EV chargers are sited. The Companies will provide the credit for up to 30 months or the end of December 2022, whichever comes first, following acceptance of documentation and approval of the completed work.

Credit Availability/Timing

Bill credits would be available from July 1, 2018 through December 31, 2022. Applications would be accepted starting July 1, 2018. Credits would be posted to bills for up to 30 months or through the end of December 2022, whichever comes first, following approval of completed documentation for the customer's EV charger installation. No new applications would be accepted after October 30, 2020, and all project completion documentation would have to be submitted to BGE by December 31, 2020.

Sample Tariff

On the following page is a sample tariff for the proposed demand charge credit.

XX. Electric Vehicle Charging Demand Credit (Sample Tariff)

Upon application by the Customer and approval by the Company, qualifying non-residential customers who have installed an Electric Vehicle (EV) charging station for a workplace or fleet use, may be eligible to receive a credit to partially offset their monthly distribution demand charge. This Rider is available to non-residential customers on Schedules XX and XX that intend to use the EV Charging system for a workplace or fleet use.

The Customer is responsible to submit an application and documentation of the completed EV Charging station installation to the Company in order to become eligible for the demand credit. The Company will determine acceptance, calculate the demand credit amount and communicate these results to the Customer.

Demand Credit Structure

EV Charging Station Type	Maximum Credit	Credit Length
Level 2 Charging Station	50% Nameplate Capacity	30 months, or the end of December 2022, whichever comes first
DC Fast Charging Station	50% Nameplate Capacity	30 months, or the end of December 2022, whichever comes first

Demand credits are applied to the Customer's bill only for a portion of the maximum distribution demand charge resulting from the addition of EV chargers to the Customers' facility service and metered load. These demand credits would be determined based on 50% of the maximum nameplate capacity for new or added L2 EV charging stations and/or DC Fast EV charging stations.

Application submission and demand credit availability will begin on July 1, 2018 and terminate on December 31, 2020. The demand credit will be a fixed amount, calculated by the Company and applied to the customers' monthly bills for the account with the installed and operational L2 or DC Fast EV charging station. The maximum allowable term for the demand charge credit is 30 months or through the end of December 2022, whichever comes first, from the date of documentation acceptance and approval for the completed work of the EV charging station. No new applications will be accepted after October 30, 2020, and all project completion documentation must be submitted to the Company by December 31, 2020.

The Company will report to Commission Staff on the use of this Rider annually.

Attachment E:
Public Sub-Portfolio

Participating Utilities

BGE Program Offering #P1

PE Program Offering #P1

Delmarva Program Offering #P1, #P2

Pepco Program Offering #P1, #P2

A. BGE Program Offering #P1: Utility Owned Level 2 and DCFC Smart Charging Stations for Public Use

BGE proposes to construct, own, and operate a network of EV charging stations across the BGE electric distribution service territory.[137] BGE would partner with state and local governments and government-associated organizations to provide public access to EV charging in select areas. All EV chargers would be available to the public, and all EV chargers would be sited on property either owned by the government entities and government-associated organizations, or controlled by those entities and organizations (such as through easements, right-of-ways, or similar legal or equitable mechanisms). Users would pay a fee to access the EV charger (a "wake-up" fee) and a flat per/kWh charge for electricity. Use and payment would be independent of BGE customer billing (EV charger fees would not appear on or be paid through BGE electric bills).

Eligibility Criteria and Concepts

- Government entities (State, county, municipal) and government-sponsored associations (e.g., redevelopment organizations, community development organizations) can apply to BGE seeking to have BGE install one or more EV chargers at the applicant's selected site(s) and to have BGE offer the EV charging service.
- BGE would build, operate, and maintain the EV charging facilities at the designated sites (including handling all necessary procurement, construction, and implementation – some or all of which could be contracted).
- BGE and the applicant would consider the proposed site areas and determine a mutually-agreeable strategy for siting and providing EV charging.
- Applicant must have ownership and/or control of the property proposed for the EV charger locations.
- Applicant must agree to keep EV chargers in the selected location for a minimum of five years, although exceptions/adjustments will be considered (e.g., repeated vandalism of chargers, naturally-caused damage to the chargers, significant redevelopment of the site, road widening, etc.).
- Selected sites must be suitable for public access to charging and must comply with local zoning and allowed use restrictions. If the selected location is not suitably zoned or does not allow for EV charging, applicant agrees to support securing the necessary permissions and allowances from applicable authorities.
- EV chargers could be L2 or DCFC technology.
- EV chargers should support State or local economic development, tourism, and community development needs as identified by the applicant.
- EV charging must be available to the public, and individual users would be charged for using the charging service.
- Projects that serve underserved and/or low-income areas for urban charging and community development are desired and encouraged.

[137] BGE also has proposed incentives for non-residential chargers owned by third-party site hosts that could be intended for public use. Those public-facing chargers would be owned and operated by other, non-utility parties. *See* BGE Program Offering #NR1.

EV Charging Costs

- BGE will evaluate opportunities for a customer subscription process to support customer administration and billing for EV charging user costs.
- Customers could elect to "subscribe" to the EV charging service for a monthly fee, entitling them to lower per-session charging costs.
- All EV charger users (regardless of subscription status) would be able to use credit cards to access EV charging services, with corresponding higher per-session charging costs.
- Charging costs per session would be set by BGE and would be the same for all charging sessions (depending on membership status and type of EV charger). Costs would be set at a rounded-up flat rate comparable to energy and delivery charges for Schedule G service.

	Membership	**Monthly Membership Charge**	**Level 2 Per-Session Charge**	**DC Fast Charger Per-Session Charge**
BGE EV Charger Network Proposal	Member	$5.00	$1 + ~$.15/kWh	$3 + ~$.15/kWh
	Non-Member	N/A	$2 + ~$.15/kWh	$5 + ~$.15/kWh

**Note that membership and per-session charges are for illustrative purposes only at this time.*

Program Timeline

BGE will begin accepting applications starting in July 2018 (pending Commission approval). The installation phase of the program will be concluded by December 31, 2022. Network operations and public access would continue thereafter.

Program Metrics

- Number of applications received, pending, and completed (annual or semi-annual)
- Number of projects, installed charging ports, and locations served (annual or semi-annual)
- Program management and infrastructure deployment costs (annual)
- Costs for ongoing program operation and customer administration (annual)
- Number of users (monthly subscribers and individual charger users) per period (annual or semi-annual)
- Charge sessions per station per month
- Revenues per month (or quarter)
- In-service performance (station availability vs. out of service) (semi-annual or annual)

Procurement Strategy

- BGE would issue an RFI/RFP to EV service equipment providers for the equipment, network, billing, and customer administration services. Depending on the number of EV charging stations and availability of product and services, BGE anticipates that multiple equipment vendors will be selected, although BGE proposes to have one single network so as to provide all EV charger users with a seamless and similar customer experience at any EV charger included in the network.
- BGE could evaluate issuing an RFI/RFP for installation management, construction and maintenance services, which could include one or more vendors and contractors.
- BGE would establish an internal program management resource to oversee outreach, installation, customer engagement, and overall program management.
- BGE would procure EV chargers with "smart capabilities" including Managed Charging.

Estimated Number of EV Chargers and Associated Costs

- BGE proposes to deploy up to 1,000 public EV charging ports over a five-year period (2018-2022). The breakout between L2 and DCFC could be expected to follow the proportions indicated in the NREL gap analysis with about 1 DCFC for every 8 to 9 L2 chargers installed. The actual numbers will depend on customer-driven requests and the individual customer applications. BGE estimates the following regarding the number of EV chargers deployed each year and the corresponding costs over the five-year life of the program:

	2018	2019	2020	2021	2022	Total
Number of Chargers	100	140	200	260	300	1,000
Capital Budget	$1,500,000	$2,100,000	$3,000,000	$3,900,000	$4,500,000	$15,000,000
O&M Expenses	$144,000	$255,600	$393,600	$558,000	$690,000	$2,041,200
Total Program Costs	$1,644,000	$2,355,600	$3,393,600	$4,458,000	$5,190,000	$17,041,200

- Initial year will focus on procurement contracts and operations set-up. Subsequent years will see EV charging stations installed and put into operation.
- If Maryland's EV charging infrastructure does not materialize in sufficient amounts to support the state EV adoption goals, BGE could increase investments and targeted installations by a comparable percent in future years, starting in year 2021 (e.g., if state is 10% below target for public EV chargers, BGE could increase the investment and target installations by 25% going forward).

Attachment E – Public Sub-Portfolio

BGE Program Offering #P1						
Program Offering	Utility Owned Level 2 and DCFC Smart Charging Stations for Public Use					
Sub-portfolio	Public Use					
Brief Description	BGE would build, own and operate a network of EV charging stations across the BGE service territory in partnership with local municipal, government and government associated organizations to provide public access EV charging to the areas.					
Ownership Model	Utility-Owned/Operated					
EVSE Procurement Overview	BGE would issue an RFI / RFP to EVSE providers for the equipment, network, billing and customer administration services. BGE could evaluate issuing an RFP for installation management, construction and maintenance services, which could include one or more vendors and contractors. BGE would establish an internal program management resource to oversee outreach, installation and customer engagement and overall program management. BGE would procure chargers with "smart capabilities" including Managed Charging.					
Cost to Participant	No cost to site host for placement of the chargers. BGE will evaluate opportunities for a customer subscription process to support customer administration and charging use billing. Customer could elect to "subscribe" to the service and pay a monthly fee, and in return pay a lower fee for each charge session. Drivers will also be able to use credit cards for "instant" access if they are not participating in a program service. Energy costs would be the same for all charging sessions and set at a rounded up rate comparable to energy and delivery for Schedule G service.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget[138]	$1,500,000	$2,100,000	$3,000,000	$3,900,000	$4,500,000	$15,000,000
O&M Expenses[139]	$ 144,000	$ 255,600	$ 393,600	$ 558,000	$ 690,000	$ 2,041,200
Total Program Costs	$1,644,000	$2,355,600	$3,393,600	$4,458,000	$5,190,000	$17,041,200
Forecasted Measures	100	140	200	260	300	1,000

[138] The capital budget reflects costs for the charger unit, installation and wiring, electrical upgrades, engineering review, permits and network establishment.
[139] The O&M expenses reflect costs for program management, maintenance, network fees, property taxes, customer education and outreach, and program evaluation, measurement, and verification.

Attachment E – Public Sub-Portfolio

Objective of the Program Offering	City, state and municipal governments, agencies and associated agencies (i.e. redevelopment organization or community development organization) in partnership with the local municipality can apply to BGE to consider BGE installing EV charging and offering the charging service. Applicant (community, municipality, state, agencies) must have ownership, control or easement for proposed locations. Chargers would support local economic development, tourism, and community development needs as identified by the organization. Charging would be available to the public, and individual users would be charged for using the charging service. Projects that serve underserved and/or low income areas for urban charging and community development are desired and encouraged.
Evaluation metrics	Number of applications received, pending and completed Number of projects; installed charging units (ports), locality locations served Costs for program management, infrastructure deployment Costs for ongoing program operation and customer administration Number of users (subscribers, individual users) per period Charge Sessions per station per month Revenues per month In-service performance (station availability vs. out of service)
Evaluation plan	BGE will track and report the data on a semi-annual basis to the Commission consistent as recommended earlier in the EV Portfolio. BGE supports the consideration of the Utilities jointly procuring a contractor to independently evaluate the metrics at the conclusion of the program.
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.
Firm sunset date of program offering	Start (best estimate pending PSC approval) – accept applications starting July 2018, close out by December 2022

B. PE Program Offering #P1: Level 2 and DC Fast Chargers at Public Service Locations

At public-facing service locations, PE customers may apply to have the Company install an EVSE at their service location, subject to certain eligibility criteria discussed further below. This program will include the installation of up to 50 dual port AC Level 2 chargers and up to 9 DC Fast Chargers locations. PE will be targeting one of the nine DC Fast charger locations, where grid capacity is at a premium, to install an innovation project to demonstrate the combination of an energy storage system with DC Fast charger technology to observe how grid demand can be monitored and limited below a set kW value.

Once a customer is selected for participation in the public program, PE will work with the customer to determine a location for the charger. The Level 2 charger may either be located behind the customer's current service meter or at a separately-metered new service location. Up to 50% of all Level 2 chargers may be located behind the customer's current service meter. All other chargers will be located at separately-metered service locations. PE will honor the customer's preference for charger location, unless the customer's preference would result in unreasonable distribution upgrades or other costs, or after PE has met the 50% cap identified above.

Incentive Amounts

If installed behind the meter for the service location, the owner of the service location will be responsible for installing the conduit and wiring from the customer's service panel to the charger. PE will provide a reimbursement for the wiring installation costs of up to $2,000. PE will be the owner of the charger, while the owner of the service location will be the owner of the wiring from the service panel to the charger. Operational decisions related to the charger may be made by the owner of the service location. The customer may choose to offer free charging to EV users or to offer the charging at a price to EV users. The price to users may be chosen by the customer, with input from PE and the customer's EVSE network provider to the extent necessary. All electricity delivered to the charger will be charged at the rate schedule for the service location as part of the owner's monthly service bill from PE.

If the Level 2 charger is installed behind a separately-metered new service location, the owner will simply host the charger without any involvement in terms of vendor selection or charging pricing. This model may be more attractive within the public program, where participants would prefer not to be involved in any charging pricing decisions. Due to the additional technical considerations associated with DC Fast chargers, all DC Fast chargers must be installed at a separately-metered new service location.

At the separately-metered service locations, PE will own and operate all infrastructure, including the charger. In addition, EV users will be charged PE's EV rate based on the embedded metrology of the charger, at a rate of $0.15/kWh plus a $2.00 wake up fee per charge at Level 2 chargers and $0.19/kWh plus a $3.00 wake up fee per charge at DC Fast chargers.[140]

[140] The EV rate for Level 2 and DC Fast chargers may be adjusted during the program to ensure the rate is representative of market prices.

Any revenues exceeding the standard retail tariff charge for the separately-metered service location will be credited back to customers via the surcharge rider, thereby lowering the cost impact on customers. PE will seek approval from the Commission's engineering group of the embedded metrology within each EVSE hardware type as a sub-meter under the Commission's regulations.

Eligibility Criteria

Applicants for this program will be chosen by PE based on the following factors:

- proximity of the proposed EVSE to other chargers in the area;
- proximity of the EVSE to NREL "hot spot" locations;
- number of likely users of the charger;
- likelihood that a charger would be adopted at the service location, but for the pilot program;
- length of time users are likely to be at the location; and
- distribution planning implications at the location.

Program Timeline

Applications may be submitted by PE customers beginning January 1, 2019. Charger installation will conclude after the installation of 59 chargers or by December 31, 2023, when the program is scheduled to conclude.

Program Metrics

PE is looking to achieve two different objectives in the siting of the charging infrastructure. First and foremost, PE will focus on establishing a baseline level of EVSE infrastructure in its service territory.[141] At the same time, however, PE will try to identify locations for charger installation that, without this Pilot Program, would otherwise be unlikely to have EVSE infrastructure installed. PE will strive to balance each of these objectives in its implementation of the public program.

Metrics by which PE will evaluate the public program include: frequency of daily charging at the service location; length of charging at the service location; timing of daily charging at the service location; the usage and demand associated with each charge; the number of daily charger users by service location type; and the charging pricing methodology

Procurement Strategy

PE will issue an RFP to choose one or more EVSE network providers, EVSE hardware providers, installers and electricians, and entities who will handle day-to-day application processing, data acquisition, and customer outreach and education. PE will require that all EVSE hardware be network-enabled in order to track and communicate interval charging data to PE, including the charging timing, frequency, and usage. To the extent multiple EVSE vendors are selected, customers who choose to install the Level 2 charger behind their service meter will

[141] Current EVSE infrastructure maps indicate that there is a dearth of charging infrastructure in PE's service territory.

have the option of choosing their own EVSE network and hardware vendors, or they can request that PE choose these vendors on their behalf. Where PE is asked to assign vendors or where the charger is located behind a separately-metered service location, PE will use a "round robin" approach in an effort to promote equitable EVSE involvement in the program. Each EVSE network provider must agree to release interval charging data to PE, including the usage, demand, frequency, length, start and end times of daily charging, and the charging price per user. The EVSE network providers will communicate this data to PE, who will report this data to the Commission on a semi-annual basis.

Estimated Program Costs

The costs associated with the public program are projected to be $3,191,451, broken down as follows:

	2019	**2020**	**2021**	**2022**	**2023**	**Total**
L2 Capital	$151,290	$ 151,290	$151,290	$151,290	$ 151,290	$ 756,450
L2 O&M	$117,869	$ 136,177	$152,825	$171,132	$ 189,440	$ 767,443
Total Program Costs	$269,159	$ 287,467	$304,115	$322,422	$ 340,730	$ 1,523,893
DCFC Capital	$144,500	$369,500	$289,000	$289,000	$289,000	$ 1,381,000
DCFC O&M	$ 16,185	$ 48,721	$ 65,247	$ 73,884	$ 82,521	$ 286,558
Total Program Costs	$160,685	$ 418,221	$354,247	$362,884	$ 371,521	$ 1,667,558

The capital budget reflects the charger unit, installation, wiring installation (where applicable), electrical upgrades, and engineering review costs. The O&M budget reflects the program management, maintenance agreement, service plan, networking fees, property tax, wiring installation rebate (where applicable), evaluation, measurement, and verification, and education and customer outreach costs.

Attachment E – Public Sub-Portfolio

PE Program Offering #P1						
Program Offering	Level 2 and DC Fast Chargers at Public Service Locations					
Sub-portfolio	Public					
Brief Description	PE will install up to 50 Level 2 chargers and 9 DC Fast chargers at public service locations. PE will own and operate the chargers.					
Ownership Model	Utility-owned/operated					
EVSE Procurement	Request-for-proposal process					
Cost to Participant	Wiring and installation costs exceeding $2,000 where the charger is installed behind the current meter; no costs where the charger is installed at a separately-metered service location.					
	2019	**2020**	**2021**	**2022**	**2023**	**Total**
L2 Capital	$151,290	$ 151,290	$151,290	$151,290	$ 151,290	$ 756,450
L2 O&M	$117,869	$ 136,177	$152,825	$171,132	$ 189,440	$ 767,443
Total Program Costs	$269,159	$ 287,467	$304,115	$322,422	$ 340,730	$ 1,523,893
Forecasted - Level II	10	10	10	10	10	50
DCFC Capital	$144,500	$369,500	$289,000	$289,000	$289,000	$ 1,381,000
DCFC O&M	$ 16,185	$ 48,721	$ 65,247	$ 73,884	$ 82,521	$ 286,558
Total Program Costs	$160,685	$ 418,221	$354,247	$362,884	$ 371,521	$ 1,667,558
Forecasted - DCFC	1	2	2	2	2	9
Objective of the Program Offering	•Encourage the adoption of electric vehicles by providing access to charging infrastructure in public locations. •Evaluate charging behavior of EV users at public service locations.					
Evaluation metrics	•Frequency of daily charging at the service location. •Length of charging at the service location. •Timing of daily charging at the service location. •The usage and demand associated with each charge. •The number of daily charger users by service location type. •The charging pricing methodology.					
Evaluation plan	PE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Applications may be submitted beginning January 1, 2019. Charger installation will conclude after the installation of the 59 chargers or by December 31, 2023, when the program concludes.					

C. Delmarva and Pepco Program Offering #P1: Level 2 Public Charging Stations

This program anticipates the installation of up to 563 Level II chargers in Pepco's and Delmarva's Maryland service area. Both Pepco and Delmarva Power will examine density of PIV ownership, locations of major roadways, and other elements that promote maximum opportunity for use and convenience of PIV users.

Illustrative Charging Rates

Participating Pepco customers will be charged an estimated amount of $0.1747 per kWh for use of the Level 2 charger. Delmarva Power customers will be charged an estimated amount of $0.1789 per kWh for use of the Level 2 charger. The Green Rider is applied for this offering to ensure environmentally-friendly charging. Other fees may apply once the transaction vendor is selected. A portion of the revenue from this offering will be used to offset capital costs.

Pepco Level 2 Proposed Tariff

D - Charging Rate ($/kWh)	$	0.0928
G - Rate SGS-S	$	0.0697
T - Rate SGS-S	$	0.0064
Green Rider Charge ($/kWh)	$	0.0059
Total Rate (D/G/T/Green Rider) Excluding All Other Riders	**$**	**0.1747**
Rate Schedule for Purposes of Non-Base D Rates/Riders		GS LV

**Rate based on Tariff Effective 12/1/2017*

Delmarva Level 2 Proposed Tariff

**Rate based on Tariff Effective 12/1/2017*

Program Timeline

For charging stations incentivized by this program, installation work will need to commence prior to December 31, 2022.

Program Metrics

The metrics by which the program will be evaluated include whether the approved installations overlap with NREL-identified demand hot spot, and whether any grid upgrades were triggered by EVSE installation.

Procurement Strategy

PHI intends to issue a competitive bid solicitation to procure the charging stations to be installed through this program. PHI expects to extend offers to multiple vendors.

Estimated Program Costs

The estimated program costs associated with the public charging stations in neighborhoods program are: $2.7 million (Delmarva) and $7.4 million (Pepco). In the following templates for program offering #P1, the O&M budget reflects the program's allocation of billing, program management, system interfaces and updates, and analysis & reporting costs. The capital budget reflects the costs of a new Smart Level 2 EVSE and payment module, costs associated with utility infrastructure upgrades, and the costs of an inspection.

Attachment E – Public Sub-Portfolio

Delmarva Offering #P1						
Program Offering	Level 2 Public Charging Stations					
Sub-portfolio	Public					
Brief Description	The program would pay 100% of the Smart Level II charging stations and 100% of the charger installation cost.					
Ownership Model	Utility-owned and operated					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. Will obtain separate vendor to administer transactions for customers and over the course of the deployment the company will seek to demonstrate the ability to have all existing vendors customers access the charger seamlessly.					
Cost to Participant	Pays for use of charger at point of sale, revenue used to offset capital costs.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 112,000	$ 503,000	$ 726,000	$ 447,000	$ 447,000	$ 2,235,000
O&M Budget[142]	$ 59,633	$ 112,300	$ 112,300	$ 81,133	$ 96,133	$ 461,500
Total Program Costs	$ 171,633	$ 615,300	$ 838,300	$ 528,133	$ 543,133	$ 2,696,500
Forecasted Measures - Level II	7	34	48	30	30	149
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various local neighborhoods. •Obtain separate vendor to administer transactions for various vendor participants.					
Evaluation metrics	•Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Installation initiated by December 31, 2022.					

[142] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment E – Public Sub-Portfolio

Pepco Offering #P1						
Program Offering	Level 2 Public Charging Stations					
Sub-portfolio	Public					
Brief Description	The program would pay 100% of the Smart Level II charging stations and 100% of the charger installation cost.					
Ownership Model	Utility-owned and operated					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. Will obtain separate vendor to administer transactions for customers and over the course of the deployment the company will seek to demonstrate the ability to have all existing vendors customers access the charger seamlessly.					
Cost to Participant	Pays for use of charger at point of sale, revenue used to offset capital costs.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 311,000	$ 1,397,000	$2,018,000	$1,242,000	$1,242,000	$6,210,000
O&M Budget[143]	$ 120,133	$ 284,133	$ 284,133	$ 218,633	$ 233,633	$1,140,667
Total Program Costs	$ 431,133	$ 1,681,133	$2,302,133	$1,460,633	$1,475,633	$7,350,667
Forecasted Measures - Level II	21	93	134	83	83	414
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various local neighborhoods. •Obtain separate vendor to administer transactions for various vendor participants.					
Evaluation metrics	•Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Installation initiated by December 31, 2022.					

[143] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

D. Delmarva and Pepco Program Offering #P2: DCFC for Public Use

This program anticipates the installation of 45 Direct Current Fast Chargers (DCFC) in main transportation corridor sites at an appropriate location or in a community depot configuration. Both Pepco and DPL will examine density of PIV ownership, locations of major roadways, NREL Data and other elements that will provide maximum opportunity for use and convenience. Also, embedded or reduced demand charges will be considered. In addition, for this offering, there is potential for coupling storage which falls into the Technology Demonstration category. Opportunities will be evaluated to couple multiple DCFC with energy storage such that demand chargers could potentially be eliminated.

Illustrative Charging Rates

Participating Pepco customers will be charged an estimated amount of $0.1747 per kWh for use of the DCFC charger. Participating Delmarva customers will be charged an estimated amount of $0.1789 per kWh for use of the DCFC charger. The Green Rider is applied for this offering to ensure environmentally-friendly charging. Other fees may apply once the transaction vendor is selected. A portion of the revenue from this offering will be used to offset capital costs.

Pepco DCFC Proposed Tariff

**Rate based on Tariff Effective 12/1/2017*

Delmarva DCFC Proposed Tariff

**Rate based on Tariff Effective 12/1/2017*

Program Timeline

For charging stations incentivized by this program, installation work will need to commence prior to December 31, 2022.

Program Metrics

The metrics by which the program will be evaluated include whether the approved installations overlap with NREL-identified demand hot spot, and whether any grid upgrades were triggered by EVSE installation.

Procurement Strategy

PHI intends to issue a request for proposals to procure a diverse EVSE vendor pool. Multiple EVSE vendors will be pre-qualified for participation in the program. PHI plans to obtain separate vendor to administer transactions for customers, and over the course of the deployment the company will seek to demonstrate the ability to have all existing vendors customers access the charger seamlessly.

Estimated Program Costs

The estimated program costs associated with the public charging stations in neighborhoods program are: $1.9 million (Delmarva) and $5.1 million (Pepco). In the following templates for program offering #P2, the O&M budget reflects the program's allocation of billing, program management, system interfaces and updates, and analysis & reporting costs. The capital budget reflects the costs of a new DCFC and payment module, costs associated with utility infrastructure upgrades, and the cost of an inspection.

Delmarva Offering #P2						
Program Offering	DC Fast Charger Public Stations					
Sub-portfolio	Public					
Brief Description	The program would pay 100% of the DC Fast Charger and 100% of the charger installation cost.					
Ownership Model	Utility-owned and operated					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. Will obtain separate vendor to administer transactions for customers and over the course of the deployment the company will seek to demonstrate the ability to have all existing vendors customers access the charger seamlessly.					
Cost to Participant	Pays for use of charger at point of sale, revenue used to offset capital costs.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ 144,000	$ 432,000	$ 504,000	$ 216,000	$ 144,000	$ 1,440,000
O&M Budget[144]	$ 59,633	$ 112,300	$ 112,300	$ 81,133	$ 96,133	$ 461,500
Total Program Costs	$ 203,633	$ 544,300	$ 616,300	$ 297,133	$ 240,133	$ 1,901,500
Forecasted Measures - DCFC	1	4	4	2	1	12
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various locations along major roadways, based on NREL data and other elements that will provide maximum opportunity for use and convenience.					
Evaluation metrics	•Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Installation initiated by December 31, 2022.					

[144] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Pepco Offering #P2						
Program Offering	DC Fast Charger Public Stations					
Sub-portfolio	Public					
Brief Description	The program would pay 100% of the DC Fast Charger and 100% of the charger installation cost.					
Ownership Model	Utility-owned and operated					
EVSE Procurement Overview	Submit RFP for diverse vendor pool and prequalify multiple vendors for participation. Will obtain separate vendor to administer transactions for customers and over the course of the deployment the company will seek to demonstrate the ability to have all existing vendors customers access the charger seamlessly.					
Cost to Participant	Pays for use of charger at point of sale, revenue used to offset capital costs.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$396,000	$1,188,000	$1,386,000	$ 594,000	$ 396,000	$ 3,960,000
O&M Budget[145]	$120,133	$ 284,133	$ 284,133	$ 218,633	$ 233,633	$ 1,140,667
Total Program Costs	$516,133	$1,472,133	$1,670,133	$ 812,633	$ 629,633	$ 5,100,667
Forecasted Measures - DCFC	3	10	12	5	3	33
Objective of the Program Offering	•Facilitate and encourage access to benefits derived from vehicle fleet electrification. •Expand charging capabilities to various locations along major roadways, based on NREL data and other elements that will provide maximum opportunity for use and convenience.					
Evaluation metrics	•Whether the approved installations overlap with NREL-identified demand hot spot. •Whether any grid upgrades were triggered by EVSE installation.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Installation initiated by December 31, 2022.					

[145] Allocated costs based on the total program costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment F:
Innovation Sub-Portfolio

Participating Utilities

BGE Program Offering #I1

Delmarva Program Offering #I1

Pepco Program Offering #I1

Attachment F – Innovation Sub-Portfolio

A. BGE, Delmarva, and Pepco Program Offering #I1: Innovation Fund

BGE, Delmarva, and Pepco propose to establish a program by which interested persons or groups could seek funding from the utility company for innovative projects designed to further advance equitable access to EV charging in the State and support electrification of the transportation sector in urban and underserved communities. The funding, which the companies are calling Innovation Incentives, would be awarded based on an application and review process conducted by the individual companies, with assistance and input from key stakeholders. The proposed incentives would be a monetary rebate issued by the respective utility in an amount up to 50% of the cost of the project to purchase and install all necessary EV chargers. The project cost amounts project to which the rebate would apply would be the net project cost after applying all available grants from MEA and the federal government, as well as all other applicable incentives, grants, awards, and discounts.

Incentive Amounts

- Rebate amounts capped at $5000/advanced L2 EV charger, $15,000/DCFC charger less than 100kW, $25,000/DCFC charger equal to or greater than 100kW, and $35,000/DCFC charger over 100kW when paired with energy storage to manage the EC charger's load impact.
- Rebates for public transit EV chargers different than advanced L2 or DCFC are capped at $25,000/charger.
- Maximum award is $75,000/site and $250,000 for a multi-site project.

Eligibility Criteria

- Active or pending utility account holder who proposes, designs, installs or contracts to have designed and installed, an EV charging project that is designed to overcome barriers for EV charging in urban workplace, multi-family, multi-tenant, car share, or urban charging and public transit applications that support the community.
- Proposed project must be able to serve multiple users and/or multiple tenants. Examples include, but are not limited to, electric car share hubs, urban residential charging hubs, DCFC applications for multi-family and multi-tenant applications, and electric public transit or mobility fleet applications.
- Projects that serve emergent applications for the public and/or low-income areas for urban charging, car share, mobility fleet, and similar applications are desired and encouraged.
- Proposals will be reviewed for eligibility compliance by the utility, the MEA Clean Cities Coordinator/Transportation Program Manager, and MDE representatives.
- The final incentive amount may vary from pre-review expectation as costs and scope may have changed in the interim.

Program Timeline

- The proposed program would begin in 2018 and run for five years, through 2022.
- BGE, Delmarva, and Pepco would begin taking rebate applications upon Commission program approval.
- BGE, Delmarva, and Pepco would accept completed applications until June 30, 2022, and accept supporting paperwork by November 30, 2022 (this allows for review and processing of the incentives by December 31, 2022).

Program Metrics

- Applications received and approved
- Incentives paid
- Types of EV chargers sited and the specific location
- EV charger use and applications served
- Portfolio of successful applications
- Energy demand offset by storage resources

Procurement Strategy

This is a customer-driven application process funded through a grant.

Estimated Program Costs

BGE:

BGE estimates the following regarding the number of innovation incentives paid and the corresponding program costs over the life of the program (2018-2022):

Innovation						
	2018	2019	2020	2021	2022	Rounded Totals
Chargers	40	70	100	130	150	490
Incentives	$457,143	$800,000	$1,142,857	$1,485,714	$1,714,286	$5,600,000
Education	$36,352	$63,617	$90,881	$118,145	$136,321	$445,316
Nescaum	$23,382	$23,382	$23,382	$23,382	$23,382	$116,910
Admin	$10,938	$19,141	$27,344	$35,548	$41,016	$133,987
EMV	$4,602	$8,054	$11,505	$14,957	$17,258	$56,377
Deployment	$74,220	$129,885	$185,551	$241,216	$278,326	$909,198
Annual Sums	$606,637	$1,044,079	$1,481,520	$1,918,962	$2,210,589	$7,261,788

*Annual sums include incentives, education and program administration costs.
**Annual EV charger count/application is an estimate. Actuals could vary.
***Charging units are not specifically captured in the preliminary NREL Gap Analysis.

Utilizing the budget set forth above, there exists the potential for up to 1100 L2 EV chargers or 370 DCFC EV chargers facilitated through the program. The 490 estimated chargers assume most of the installations will be DCFC.

BGE Program Offering #I1						
Program Offering	Level 2 and DCFC Smart Charging Stations for Innovative Solutions					
Sub-portfolio	Innovation					
Brief Description	Active or pending BGE customer (account holder) who proposes, designs, installs, or contracts to have designed, and installed, an electric vehicle charging project that overcomes barriers for charging in urban workplace, multi-family, multi-tenant, car share, and urban charging and public transit applications that support the community.					
Ownership Model	Grant					
EVSE Procurement Overview	Customer to apply to BGE with project proposal for pre-construction review and consideration. Proposals will be reviewed by BGE, MEA (Clean Cities coordinator / Transportation program Manager), MDE (MD EVIC and VW Settlement) representatives, as well as a representative from a LMI advocacy organization and a representative from an environmental advocacy organization, for eligibility compliance. If there is a significant change in proposed project cost or scope, BGE must be notified in advance of completion of work with the details of the change. Customer to also provide documentation of completed installation and confirmation of operational status of equipment for award of incentive. BGE will review the applicable information for completeness and release the applicable incentive to the BGE customer. The final incentive amount may vary from pre-review expectation as costs and scope may have changed in the interim time.					
Cost to Participant	BGE proposes to provide an incentive of up to 50% of the cost of the EVSE project, where costs are net of MEA, other applicable incentives, grants, awards, discounts. Incentive capped at: $5,000 per L2 charger $15,000 per DC Fast Charger less than 100kW $25,000 per DC Fast Charger equal to or greater than 100kW $35,000 per DC Fast Charger over 100kW when paired with storage to manage Charger's load impact $25,000 per unit for public transit charging that is different than DCFC or L2 charging) Maximum award is $75,000 per site and $250,000 for a multi-site project.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Incentive Budget[146]	$457,143	$ 800,000	$1,142,857	$1,485,714	$1,714,286	$ 5,600,000
Non-Incentive Budget[147]	$149,494	$244,079	$338,663	$433,248	$496,304	$1,661,788
Total Program Costs	$606,637	$1,044,079	$1,481,520	$1,918,962	$2,210,589	$7,261,788
Forecasted Measures	40	70	100	130	150	490

[146] The incentive budget reflects the rebate amounts to customers.
[147] The non-incentive budget reflects customer education and outreach (including NESCAUM), program administration, program deployment, and evaluation, measurement and verification costs.

Attachment F – Innovation Sub-Portfolio

Objective of the Program Offering	Encourage innovative ideas through incentives to share EV benefits through urban, multi-use and public serving uses of electric transportation. Project must be able serve multiple users and/or multiple tenant applications. Examples include, but may not be limited to: Electric car share hubs Urban residential charging hubs DC Fast Charge applications for multi-family and multi-tenant applications Electric public transit, mobility fleet applications Projects that serve emergent applications for the public and/or underserved or low-income areas for urban charging, car share, mobility fleet and similar applications are desired and encouraged.
Evaluation metrics	Applications, received and approved Incentives awarded Type of charger, location Charging use/application served Portfolio of Successful Applications Energy demand offset by Storage
Evaluation plan	BGE will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available as part of semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally-identifiable information.
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.
Firm sunset date of program offering	Start (best estimate pending PSC approval) – accept applications starting July 2018, close out by December 2022

Pepco Offering #I1						
Program Offering	Innovation Fund					
Sub-portfolio	Innovation					
Brief Description	Active or pending Pepco customer (account holder) who proposes, designs, installs, or contracts to have designed, and installed, an electric vehicle charging project that overcomes barriers for charging in urban workplace, multi-family, multi-tenant, car share, and urban charging and public transit applications that support the community.					
Ownership Model	Grant					
EVSE Procurement Overview	Customer to apply to Pepco with project proposal for pre-construction review and consideration. Proposals will be reviewed by Pepco, MEA (Clean Cities coordinator / Transportation program Manager), and MDE (MD EVIC and VW Settlement) representatives, as well as a representative from a LMI advocacy organization and a representative from an environmental advocacy organization, for eligibility compliance. If there is a significant change in proposed project cost or scope, Pepco must be notified in advance of completion of work with the details of the change. Customer to also provide documentation of completed installation and confirmation of operational status of equipment for award of incentive. Pepco will review the applicable information for completeness and release the applicable incentive to the Pepco customer. The final incentive amount may vary from pre-review expectation as costs and scope may have changed in the interim time.					
Cost to Participant	Pepco proposes to provide an incentive of up to 50% of the cost of the EVSE project, where costs are net of MEA, other applicable incentives, grants, awards, discounts. Incentive capped at: $5,000 per L2 charger $15,000 per DC Fast Charger less than 100kW $25,000 per DC Fast Charger equal to or greater than 100kW $35,000 per DC Fast Charger over 100kW when paired with storage to manage Charger's load impact $25,000 per unit for public transit charging that is different than DCFC or L2 charging) Maximum award is $75,000 per site and $250,000 for a multi-site project.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[148]	$ 754,800	$ 2,141,800	$2,141,800	$ 4,800	$ 19,800	$ 5,063,000
Total Program Costs	$ 754,800	$ 2,141,800	$2,141,800	$ 4,800	$ 19,800	$ 5,063,000

[148] Allocated costs based on the total program costs. The O&M budget reflects the costs of the Innovation Fund grants, as well as the program's allocation of program management and analysis & reporting costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment F – Innovation Sub-Portfolio

Objective of the Program Offering	•Develop projects that serve underserved and/or low-income areas for urban charging, car share, mobility fleet, school buses and similar applications. Encourage innovative ideas through incentives to share EV benefits through urban, multi-use and public serving uses of electric transportation.
Evaluation metrics	•Number of entities that express interest. •Whether entities provided project proposals. •Number of projects selected. •Type of charger, location •Charging use/application served •Portfolio of Successful Applications •Energy demand offset by Storage
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.
Firm sunset date of program offering	Project completion by December 31, 2022.

Delmarva Offering #I1						
Program Offering	Innovation Fund					
Sub-portfolio	Innovation					
Brief Description	Active or pending DPL customer (account holder) who proposes, designs, installs, or contracts to have designed, and installed, an electric vehicle charging project that overcomes barriers for charging in urban workplace, multi-family, multi-tenant, car share, and urban charging and public transit applications that support the community.					
Ownership Model	Grant					
EVSE Procurement Overview	Customer to apply to DPL with project proposal for pre-construction review and consideration. Proposals will be reviewed by DPL, MEA (Clean Cities coordinator / Transportation program Manager), and MDE (MD EVIC and VW Settlement) representatives, as well as a representative from a LMI advocacy organization and a representative from an environmental advocacy organization, for eligibility compliance. If there is a significant change in proposed project cost or scope, Pepco must be notified in advance of completion of work with the details of the change. Customer to also provide documentation of completed installation and confirmation of operational status of equipment for award of incentive. Pepco will review the applicable information for completeness and release the applicable incentive to the Pepco customer. The final incentive amount may vary from pre-review expectation as costs and scope may have changed in the interim time.					
Cost to Participant	DPL proposes to provide an incentive of up to 50% of the cost of the EVSE project, where costs are net of MEA, other applicable incentives, grants, awards, discounts. Incentive capped at: $5,000 per L2 charger $15,000 per DC Fast Charger less than 100kW $25,000 per DC Fast Charger equal to or greater than 100kW $35,000 per DC Fast Charger over 100kW when paired with storage to manage Charger's load impact $25,000 per unit for public transit charging that is different than DCFC or L2 charging) Maximum award is $75,000 per site and $250,000 for a multi-site project.					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[149]	$ 282,800	$ 802,800	$ 802,800	$ 4,800	$ 19,800	$ 1,913,000
Total Program Costs	$ 282,800	$ 802,800	$ 802,800	$ 4,800	$ 19,800	$ 1,913,000

[149] Allocated costs based on the total program costs. The O&M budget reflects the costs of the Innovation Fund grants, as well as the program's allocation of program management and analysis & reporting costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Attachment F – Innovation Sub-Portfolio

Objective of the Program Offering	•Develop projects that serve underserved and/or low-income areas for urban charging, car share, mobility fleet, school buses and similar applications. Encourage innovative ideas through incentives to share EV benefits through urban, multi-use and public serving uses of electric transportation.
Evaluation metrics	•Number of entities that express interest. •Whether entities provided project proposals. •Number of projects selected. •Type of charger, location •Charging use/application served •Portfolio of Successful Applications •Energy demand offset by Storage
Evaluation plan	DPL will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.
Firm sunset date of program offering	Project completion by December 31, 2022.

Attachment G:
Technology Sub-Portfolio

Participating Utilities

BGE Program Offering #T1

Delmarva Program Offering #T1

Pepco Program Offering #T1

Attachment G – Technology Sub-Portfolio

A. BGE Program Offering #T1: Technology Demonstration

BGE proposes to provide the following Technology Demonstration Projects: Managed Charging Evaluation Program at BGE Facilities.

"Managed Charging" Evaluation Program at BGE Facilities

BGE proposes to implement a "managed charging" program at designated EV Chargers installed at BGE facilities. The EVSE network capabilities would be leveraged to facilitate load management for the EV charging stations on the system. BGE would develop the communication, user education and support to alert and engage the users to the load management functionality. BGE would measure the following as part of the program:

- The deployment of software capabilities.
- Operations reliability and impact.
- Customer education and notification requirements.
- User reaction and satisfaction.

There is no incremental cost impact to the proposed EV portfolio from this effort.

B. Delmarva and Pepco Program Offering #T1: Technology Demonstration

PHI proposes to provide the following Technology Demonstration Projects: (1) DC Fast Charging with Energy Storage; (2) Virtual V2G Demonstration; and (3) Public Charging Interoperability.

DC Fast Charging with Energy Storage

PHI proposes one or more demonstration projects where an energy storage device will be paired with a cluster of DC Fast Chargers. At 100KW or above per charger, multiple chargers are expected to have significant influence on the local distribution system where they are interconnected. This demonstration project will study the potential benefits of using energy storage to mitigate any capacity or power quality impacts caused by the chargers. If successful, this method may prove a beneficial alternative to demand charges or other upgrades which might be required in order to support the spot load. The estimated project costs are $2.24 million.

Virtual V2G Demonstration

PHI proposes one or more demonstration projects were chargers are operated in cycling levels from 0%, 50%, and 100% in accordance with PJM Frequency Response regulations. On behalf of site owners, PHI would aggregate the benefits that accrue from the vehicle to grid program, and participating EV owners will receive either no-cost or discounted charging. The technology demonstration will require PHI to develop secure Communications and Control capabilities for up to 100kW of work place charges, potentially located at multiple locations. The estimated project costs are $500,000.

Public Charging Interoperability

PHI proposes to select a third party who will execute the transactions between the drivers and the utility owned Level 2 and DC Fast Chargers. This vendor would be responsible for driver registration, identification and secure payment transactions to ensure seamless operation across the Pepco and Delmarva Power owned equipment. PHI will proactively seek agreements with each of the established EV Charging companies (EVgo, ChargePoint, Sema Connect, Blink, Electrify America, Greenlots etc.) in the region to allow for registered drivers to utilize the PHI operated network/stations, and vice versa, utilizing a driver's native or preferred EV network account. Once approved, PHI proposes to initiate this effort beginning in late 2018 to early 2019.

Carbon-Free Public Charging Network

PHI proposes to apply an updated version of its Green Rider to the Electric Service for the public Level 2 and public DC Fast Chargers. PHI will procure and retire RECs from the MD RPS Mix to cover the generation mix for these chargers. This cost, which for 2018 is expected to add $0.0059 per kWh to the electric service cost, would be included by default for these two offerings. Doing so creates a network of 608 Carbon-Free Level 2 and DC Fast Chargers.

Pepco Offering #T1						
Program Offering	Technology Demonstration					
Sub-portfolio	Technology					
Brief Description	The program would fund up to $2 million for Virtual V2G Demonstration and DC Fast Charger + Storage technology demonstrations performed by the utility.					
Ownership Model	N/A					
EVSE Procurement Overview	N/A					
Cost to Participant	N/A					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[150]	$ 4,800	$ 816,800	$ 816,800	$ 404,800	$ 19,800	$ 2,063,000
Total Program Costs	$ 4,800	$ 816,800	$ 816,800	$ 404,800	$ 19,800	$ 2,063,000
Objective of the Program Offering	• Develop secure command, control, communications capabilities for 100KW of Work Place Chargers (Could be multiple sites). • Operate chargers from 0%, 50% and 100% in accordance with PJM Frequency Response. • PHI would aggregate benefits for site owners and EV owners get a free or discounted charging. •Co-Locate Energy Storage for one or more DC Fast Chargers. • Use Energy Storage as a Distribution System asset to mitigate the effects of DCFC. •Evaluate the future scenario of deploying storage to eliminate Demand Charges.					
Evaluation metrics	•Whether chargers successfully operated from 0%, 50% and 100%. •Number of times chargers were successfully operated from 0%, 50% and 100%. •Number of locations where energy storage was co-located for DC Fast Chargers.					
Evaluation plan	Pepco will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Utility project completion by December 31, 2022.					

[150] Allocated costs based on the total program costs. The O&M budget reflects the costs of the Technology Demonstration projects, as well as the program's allocation of program management and analysis & reporting costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

Delmarva Offering #T1						
Program Offering	Technology Demonstration					
Sub-portfolio	Technology					
Brief Description	The program would fund up to $740,000 for Virtual V2G Demonstration and DC Fast Charger + Storage technology demonstrations performed by the utility.					
Ownership Model	N/A					
EVSE Procurement Overview	N/A					
Cost to Participant	N/A					
	2018	**2019**	**2020**	**2021**	**2022**	**Total**
Capital Budget	$ -	$ -	$ -	$ -	$ -	$ -
O&M Budget[151]	$ 4,800	$ 312,800	$ 312,800	$ 152,800	$ 19,800	$ 803,000
Total Program Costs	$ 4,800	$ 312,800	$ 312,800	$ 152,800	$ 19,800	$ 803,000
Forecasted Measures						-
Objective of the Program Offering	• Develop secure command, control, communications capabilities for 100KW of Work Place Chargers (Could be multiple sites). • Operate chargers from 0%, 50% and 100% in accordance with PJM Frequency Response. • PHI would aggregate benefits for site owners and EV owners get a free or discounted charging. •Co-Locate Energy Storage for one or more DC Fast Chargers. • Use Energy Storage as a Distribution System asset to mitigate the effects of DCFC. •Evaluate the future scenario of deploying storage to eliminate Demand Charges.					
Evaluation metrics	•Whether chargers successfully operated from 0%, 50% and 100%. •Number of times chargers were successfully operated from 0%, 50% and 100%. •Number of locations where energy storage was co-located for DC Fast Chargers.					
Evaluation plan	Delmarva will track and report the data on a semi-annual basis to the Commission. At the conclusion of the program offering, the Utilities will jointly procure a contractor to independently evaluate the metrics.					
Plan for public sharing of key program offering data	Aggregate data at the service territory level will be made available in the semi-annual filings. County-level data will be made available to the county, upon request. All data will be anonymized and aggregated to protect personally identifiable information.					
Public review of program results	Program-to-date results will be included in the semi-annual reports submitted to the Commission, subject to mid-course and final review as described in Section VI. of the report.					
Firm sunset date of program offering	Utility project completion by December 31, 2022.					

[151] Allocated costs based on the total program costs. The O&M budget reflects the costs of the Technology Demonstration projects, as well as the program's allocation of program management and analysis & reporting costs. If any of the individual programs are eliminated, the allocated costs will have to be updated. Excludes Customer Education, Enrollment & Outreach costs.

FURTHER, FASTER, TOGETHER

Attachment H – RMI Concept Proposal to Study Electric Mobility Solutions for Low- and Moderate-Income Customers

Rocky Mountain Institute | Maryland PSC

The Concept

The need for equitable access to electrified mobility solutions in low- to moderate-income (LMI) communities is well recognized. Innovative programs and pilot projects providing electrified mobility services to LMI communities are being tested and implemented across the United States. These programs include car-share services, in which members are able to rent an electric vehicle for short periods of time, such as one to two hours, in order to run errands or for other short trips; and ride-share services, through which customers can hail an electric vehicle similar to a taxi, through a peer-to-peer ride sharing platform such as Uber and Lyft, as well as a variety of other new mobility solutions that may provide better and additive mobility, such as electric bikes and buses. These programs can provide communities with additional transportation resources, reduce air pollution, and give LMI customers, who tend to be underserved by the electric vehicle market, access to electrified mobility services. Rocky Mountain Institute (RMI) proposes to conduct a study that would elucidate the requirements for these solutions, and identify possible solutions that could be implemented in Baltimore, MD, creating an example that the rest of the nation could emulate to meet their LMI mobility needs. The study would be solution- and technology-agnostic and seek only to identify possible electrified mobility solution(s) that could form the basis for a pilot project to meet the needs of the LMI community in Baltimore.

The Study

To understand the constraints and opportunities to bring electric mobility service to LMI Communities, several key questions must be answered:

1. What are the specific mobility needs in Baltimore that the solution must address? This requirement should articulate specific routes, the anticipated demand on those routes at specific times of day, and any special assistance requirements (such as the vehicle or vehicle driver's ability to accommodate wheelchairs and walkers).
2. How many drivers and vehicles are needed to meet the identified demand?
3. What types of electric vehicles are best suited to meet the needs of these communities?
4. What type of charging network and charging infrastructure would be needed to support the identified number of vehicles, types of vehicles, and trip patterns? This requirement would identify the number of charging stations and charging depots; possible charging depot sites; whether the direct utility investments in public charging infrastructure under PC 44 could be used for the solution, or to what extent additional or dedicated charging infrastructure would be required.
5. What are the expected full program costs of providing the LMI mobility solution?
6. At what price(s) will LMI customers use an electric mobility solution in lieu of or in supplement to their current transportation options? How will this compare in cost to their current transportation options, and how will it affect the total cost of their energy burden?
7. If there is a gap between the per-ride cost of providing the service, the price point at which transportation behavior change is anticipated, and the ability of LMI riders to pay for that service, how might the solution be subsidized or otherwise supported to make the considered solutions sustainable? Financially viable?

8. If current technology costs and market conditions suggest that an electric mobility solution for LMI customers is not currently economically viable, what partnerships, grants, subsidies, or other financial innovations could make a solution viable in the near future?
9. Which service providers, such as transportation network companies (TNCs) or car-sharing companies, would be willing and able to provide service for the solution?
10. Irrespective of the ownership model for the charging stations used by the participating solution providers, how could charging be managed to provide grid services and to obtain the lowest possible cost of recharging?
11. Could the mobility service be integrated with existing MTA services and/or ride payment passes such as CharmCard, monthly passes, mobility ticket books, etc.?

As part of the study, RMI would:

1. convene stakeholders and conduct interviews and/or facilitated workshops to understand the mobility needs of the LMI community in Baltimore and what affordable mobility means in that community;
2. engage with utilities, mobility solution providers, and charging station network operators (if different from utilities) to gain an understanding of the program costs and other relevant constraints;
3. work with Baltimore utilities, TNCs, charging network operators, the Maryland PSC, and other relevant public and private entities to identify potential financial models for the project;
4. outline a partnership and business model for the identified electrified mobility LMI customer solution(s)
5. compile a summary report on the study's findings, along with suggested next steps to actually implement the identified solution(s), including the establishment of an advisory steering committee, appointed by the Commission, to guide the development of a pilot project..

Funding and Schedule

The estimated cost of the study, including any expenses for travel and materials, is $150,000. The study could potentially be funded through monies remaining from the Exelon-Pepco merger, and the charging infrastructure needed for the specified LMI mobility solution(s) could potentially be funded via the PC 44 Innovation Incentive.

If the study is approved and RMI has sufficient available capacity to carry it out, it will begin in the second half of 2018 and will be completed by the end of Q1 2019 at the latest.

About RMI's EV-Grid Initiative

Rocky Mountain Institute's EV-Grid Initiative addresses synergistic outcomes of vehicle electrification activities being pursued by cities, states, and regions. Combining elements of RMI's Mobility Practice and Electricity Practice, the EV-Grid Initiative brings thought-leadership, nationally acclaimed facilitation, and deep analysis to the intersection of vehicles and the grid, with advanced insights on how to build a profitable, sustainable, and mutually beneficial future of electrified mobility. RMI's e-Lab Leap Initiative is dedicated to empowering and improving the lives of low-income communities and households by increasing and improving access to clean energy solutions that benefit these customers by low-income households.

RMI's cutting-edge reports— *From Gas-to-Grid - Building Charging Infrastructure to Power Electric Vehicle Demand*, *Breaking Ground: New Models that Deliver Energy Solutions to Low Income Customers*, *Peak Car Ownership - The Market Opportunity of Electric Automated Mobility Services*, *Driving Integration - Regulatory Responses to Electric Vehicle Growth*, *Electric Vehicles as Distributed Energy Resources*, *Rate Design for the Distribution Edge*, and *EVgo Fleet and Tariff Analysis* —along with its outreach and convening activities via e-Lab

and its evolving “boots-on-the-ground” market based interventions, has made RMI a trusted partner to cities, states, and utilities leading the way to new business models and a clean energy economy. RMI works with key stakeholders as a trusted and independent partner, thought leader, and expert in the space of shared, electric (and autonomous) mobility solutions.

RMI EV-Grid Project Team

Chris Nelder, Manager EV-Grid Initiative
Garrett Fitzgerald, Manager Fleet Electrification
Chuck Ray, EV-Grid Specialist
Wallace Kenyon, Modeling Specialist
Leia Guccione, Principal of Electricity Program
Jerry Weiland, Managing Director of Mobility Program

About RMI

Rocky Mountain Institute (RMI)—an independent, market-focused nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. In 2014, RMI merged with Carbon War Room (CWR), whose business-led market interventions advance a low-carbon economy.

Attachment I – MJB&A Concept Proposal: Maryland Electric Vehicle Fast Charging Infrastructure Location Analysis

M.J. Bradley & Associations (MJB&A) is proposing to support the Maryland Public Service Commission (PSC) by conducting an analysis to evaluate and summarize the status of current and planned direct current fast charging (DCFC) infrastructure for electric vehicles (EVs) within the state and develop a framework for stakeholders to identify possible suitable locations for future EV charging infrastructure development. This work will be done in the context of the PC 44 proceeding and will be open to stakeholder guidance and feedback.

The project will utilize a geographic information systems (GIS) based spatial analysis to explore and develop a database of key metrics such as existing infrastructure, commercial activity, demographic data, key roadways and traffic patterns across the state of Maryland. These metrics can then be used to assign potential scores from 1 to 100 to each potential location, reflecting the potential relative suitability of that location for infrastructure development. Because users of this database may have differing priorities for new infrastructure (e.g., some may want to focus infrastructure in "gaps" in the existing DCFC network, while others may prefer locations with high traffic volume and commercial activity), MJB&A will develop methods that allow a user to adjust the weighting of different metrics and view updated exit rankings.

Analytical Framework

MJB&A has developed a set of tools that make use of GIS databases and mapping capabilities, and has deployed these tools in conjunction with the Transportation Climate Initiative (TCI). [152] These tools, the Infrastructure Location Identification Tool and Visualization Map, will be the foundation of the Maryland analysis. As explained below, the TCI initiative focused on only the interstate highway corridors across multiple states. These tools can now be used to add the key state, county and municipal roadways, and additional demographic resolution and detail in Maryland, and to incorporate PC 44 stakeholder input and feedback.

Infrastructure Location Identification, and Visualization Mapping Tools

These tools were used to assess over 4,000 miles of freeway in the 11-state TCI region (primarily those freeways designated as EV signage ready by the Federal Highway Administration). Focusing on freeway exits as possible nexuses for future infrastructure development, the analysis produced a detailed database with data including:

- **Proximity Metrics**: distance from each exit to nearest existing DCFC station, and density of DCFC ports around each exit;
- **Commercial Activity**: number of key commercial sites within a mile of each exit; and
- **Demographic Data**: population density by census tract and traffic volume on the freeway around each exit.

[152] The Transportation and Climate Initiative (TCI) is a regional collaboration of 11 Northeast and Mid-Atlantic states and the District of Columbia that seeks to develop the clean energy economy and reduce oil dependence and greenhouse gas emissions from the transportation sector. The participating states are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. For more information, see http://www.transportationandclimate.org/.

Attachment I – MJB&A Concept Proposal: Maryland Electric Vehicle Fast Charging Infrastructure Location Analysis

Project Tasks

This project will focus on expanding the manner in which these tools are used to include additional depth of analysis and data and to include:

Task 1: Maryland Database Scope and Planning

In this task, MJB&A will work with the PSC and other stakeholders to refine and finalize the scope of additional metrics to add to the Maryland Database. This will include:

- Identifying key data metric additions (to include at a minimum: Maryland tourist attractions; additional data on commercial activity; and demographic metrics such as income, education, and Disadvantaged Communities)
- Aligning data metric additions with input from PC44's planned NREL EVI-Pro gap analysis
- Determining the scope of additional roads to include in the network (to include at a minimum: key travel corridors; primary urban corridors, and the state highway system; additional roads added subject to time and budget constraints)
- Exploring possible interaction with utility operating systems (subject to data confidentiality and availability)
- Coordinating tool scope and planning with recommendations and requirements of potential charging hosts' (including utilities and third parties) siting planning and assessment processes
- Estimating realistic analytical scope that can be accommodated within project budget (i.e. trade-off between including more analysis parameters and increasing the geographic scope of the database)
- Developing specific recommendations for how to move forward with Tasks 2 - 3
- Presenting findings and recommendations on call with key stakeholders to solicit input

Task 2: Maryland Database Development

Based on approved database plan (Task 1), MJB&A will develop consolidated geographic information systems (GIS) database in ArcGIS showing EV corridors, existing and planned public EV charging station locations, and agreed-upon parameters relevant to evaluation. Where possible, this task will utilize state developed or other freely available data sets. The budget for this task assumes that this task will require the development of new geocoded data sets based on findings and recommendations from Task 1. It also assumes that some data will be purchased from third-party vendors.

Task 3: Maryland Map and Tool Development

Using this database, MJB&A will utilize a spatial analysis to develop a Maryland-specific ArcGIS map and Excel-based tool that can be used to evaluate the existing DCFC network and identify possible locations for additional infrastructure. This will include:

- Identification of nodes within the identified road network (freeway exits, intersections, etc.)
- Spatial analysis of database to assign scores to each node for each metric or sub-metric (e.g., proximity, demographics, commercial activity)
- Development of an algorithm to weight and combine metrics into total score per node
- Creating of map layers that can display key outputs and findings, incorporating stakeholder feedback on appropriate weighting of individual metrics and to use for these results.

MJB&A will present findings to the PSC and key stakeholder groups and solicit input on methodology throughout.

Task 4: Create Report

- Prepare report for PSC and stakeholder use
- Include one round of stakeholder review and revision

Deliverables

MJB&A will provide four deliverables upon completion of the analysis:

- **Excel-based Ranking Tool** with preloaded ranking methodologies as well as full customizability of weighting for stakeholder use
- **Public ArcGIS Map** that will contain:
  - All database information
  - Multiple "layers" to show final rankings (based on select weighting methodologies) to allow for visualization of possible investment locations
  - Search function by Node ID and other metrics
- **User Guide for Tool and Map,**
- **Final Report**, including description of methodology, summary of results, and key findings.

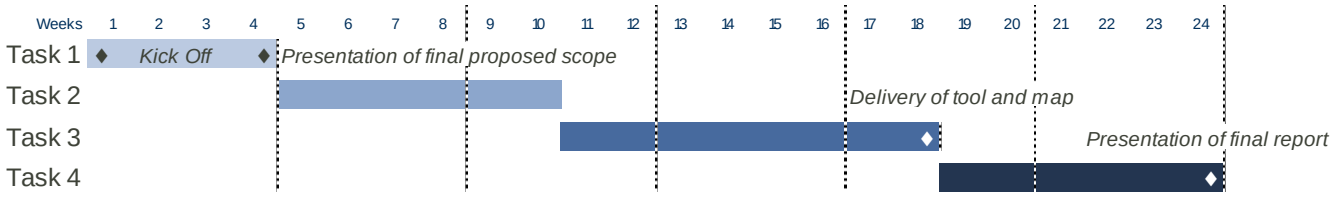
Timeline & Budget

The total budget will not exceed $85,000 and the work will be billed according to a MJB&A staff daily rate as provided below. This project is estimated to require 450 - 500 hours of effort, and up to $10,000 in reimbursable expenses for data purchase and/or software licensing fees. All reimbursable expenses will be billed at cost without mark-up.

The proposed project timeline is shown below, tied to a first kick-off scoping meeting with key PSC staff and stakeholders. We are confident that some of the planning, scoping, and data gathering tasks listed above are

Attachment I – MJB&A Concept Proposal: Maryland Electric Vehicle Fast Charging Infrastructure Location Analysis

"no-regrets" actions that we can begin based on signs of sufficient interest and commitment from key stakeholders, though full work toward these tasks to meet this timeline will necessarily be linked to the Maryland PSC's consideration process; and if approved, the timeline determined by the PSC. In total, we propose to complete all deliverables within 6 months.



Attachment J: Letters of Support

Senator Brian J. Feldman

Senator James N. Mathias, Jr.

Delegate Kumar P. Barve – Chair, Environment and Transportation Committee

Delegate Dana Stein – Vice-Chair, Environment and Transportation Committee

Delegate Pamela Beidle

Delegate Andrew Cassilly

Delegate William G. Folden

Delegate David Fraser-Hidalgo

Delegate Clarence K. Lam

Delegate Benjamin F. Kramer

Delegate Herb McMillan

Delegate Aruna Miller

Delegate Shane Robinson

Delegate Waldstreicher

The Association of Global Automakers & The Alliance of Automobile Manufacturers

Bowie, Mayor and City of

Caves Valley Partners

Clean Air Partners DC-MD-VA

CLEAResult

Columbia Association, Inc.

Downtown Annapolis Partnership

Eastport Civic Association

Economic Alliance of Greater Baltimore

Edison Electric Institute

Electric League of Maryland, Inc.

Energetics

Frederick, City and Mayor of

Garver Development Group

General Motors

Greater Baltimore Committee

Harford County Chamber of Commerce

Inner West Street Association of Annapolis

Northeast States for Coordinated Air Use Management (NESCAUM)

Mark A. Bell

Sagamore Development (Port Covington)

SemaConnect

Tesla

Tradepoint Atlantic

Waterfront Partnership of Baltimore, Inc.

West Laurel Civic Association

Brian J. Feldman
Legislative District 15
Montgomery County

Finance Committee

Chair
Health Subcommittee

Chair
Joint Committee on Federal Relations

Joint Committee on Cybersecurity,
Information Technology and Biotechnology

ORIGINAL

218197

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The Senate of Maryland

ANNAPOLIS, MARYLAND 21401

December 11, 2017

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Public Conference 44 – Electric Vehicle Infrastructure Acceleration

Dear Chair Hughes and Commissioners:

As a former member of the Electric Vehicle Infrastructure Council, I would like to express my appreciation for the work the Maryland Public Service Commission (Commission) has undertaken in Public Conference 44 to examine how Maryland's electric utility companies can support the transition to an electric transportation network. Maryland has set forth ambitious goals in this area and your action to enable electric utility companies to invest in technology, infrastructure, customer programs and services will help Maryland transition to an electric transportation network and, in so doing, provide significant benefit to Marylanders and our environment.

As you know, Maryland is one of ten states that has adopted California's Zero Emission Vehicle (ZEV) mandate under which automakers must sell an increasing percentage of ZEVs (i.e. battery-electric, plug-in hybrid-electric and fuel cell-electric vehicles) through the 2025 model year. Today, just over 10,000 electric vehicles have been sold in Maryland. The State still needs to sell nearly 300,000 more ZEVs to meet its 2025 mandate requirements and, therefore, must continue to facilitate legislative and regulatory policy that advances electric vehicle adoption. With the passage of the Clean Cars Act of 2017, the amount of rebates available to Marylanders purchasing qualifying electric vehicles doubled and the excise tax credit for those vehicle purchases increased by 40 percent. According to the recent M.J. Bradley economic analysis presented to the Commission PC 44 EV working group, the potential economic benefit to Marylanders could reach nearly $34 billion if Maryland meets its long-term goals to reduce vehicle GHG emissions by 80 percent from 2006 levels by 2050.

Electric utility companies can play a transformative role in the adoption of electric vehicles and help ensure that economic benefits are delivered to Marylanders. Specifically, electric utility companies can change consumer behavior by providing additional incentive based programs and customer education and awareness efforts. As more electric vehicles use our roads and highways, Marylanders will all benefit from cleaner air and a cleaner Chesapeake Bay, our most treasured natural and economic resource. Reducing tailpipe emissions, which accounts for nearly one-third of all carbon dioxide emissions, is a significant factor to achieving Maryland's greenhouse gas emission reduction targets.

I applaud the Commission's work on advancing electric vehicle adoption in Public Conference 44 and, by directing the electric utility companies to implement additional incentive programs, public charging infrastructure, customer education and awareness programs, the electric transportation network in Maryland will benefit.

Sincerely,

Brian J. Feldman

Brian J. Feldman

JAMES N. MATHIAS, JR.
Legislative District 38
Somerset, Wicomico,
and Worcester Counties

Finance Committee

Executive Nominations Committee

Joint Committee on Administrative,
Executive, and Legislative Review

Joint Subcommittee on Program
Open Space/Agricultural Land Preservation

Chair, Eastern Shore Senate Delegation

THE SENATE OF MARYLAND
ANNAPOLIS, MARYLAND 21401

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Fax 410-352-3087

218121

December 4, 2017

FILED
DEC 08 2017
PUBLIC SERVICE COMM
OF MARYLAND

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Public Conference 44 – Electric Vehicle Infrastructure Acceleration

Dear Chairman Hughes and Commissioners:

As the Maryland Senate appointee to the Electric Vehicle Infrastructure Council, I write to express my appreciation for the work this Maryland Public Service Commission (Commission) has undertaken in Public Conference 44 to examine how Maryland's electric utility companies can support the transition to an electric transportation network. Maryland has set forth ambitious and necessary goals in this area, and your action to enable the electric utility companies to invest in technology, infrastructure and customer programs and services will help Maryland transition to an electric transportation network sooner providing significant benefit to Marylanders and our environment.

Maryland is one of 10 states that has adopted California's Zero Emission Vehicle (ZEV) mandate under which automakers must sell an increasing percentage of ZEVs (i.e. battery-electric, plug-in hybrid-electric and fuel cell-electric vehicles) through the 2025 model year. Today, just over 10,000 electric vehicles have been sold in Maryland. The state still needs to sell nearly 300,000 more ZEVs to meet its 2025 mandate requirements. The state must continue to facilitate legislative and regulatory policy that advances electric vehicle adoption.

Electric utility companies can help play a transformative role in the adoption of electric vehicles and help ensure the above economic benefits are delivered to Marylanders. Specifically, the electric utility company can change consumer behavior by providing additional incentive based programs and customer education and awareness efforts. As more of these cars are on Maryland roads and highways, we will all benefit from cleaner air that we breathe and a cleaner Chesapeake Bay, our most treasured natural and economic resource. Reducing tailpipe emissions, which accounts for nearly one-third of all carbon dioxide emissions, is a significant factor to achieving Maryland's greenhouse gas emission reduction targets.

Again, I applaud the Commission's work on advancing electric vehicle adoption in Public Conference 44. Directing the electric utility companies to implement additional incentive programs, public charging infrastructure, and customer education and awareness programs will reduce barriers to entry for electric vehicle adoption and drive outcomes that benefit all Marylanders.

Sincerely,

James N. Mathias Jr.

Senator James N. Mathias, Jr.

KUMAR P. BARVE
CHAIRMAN

THE MARYLAND HOUSE OF DELEGATES
ENVIRONMENT AND TRANSPORTATION COMMITTEE

January 18, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Public Conference 44 – Electric Vehicle Infrastructure Acceleration

Dear Chairman Hughes and Commissioners:

As Chairman of the House Environment and Transportation Committee of the Maryland General Assembly, I write to express my appreciation for the work this Maryland Public Service Commission (PSC) has undertaken in Public Conference 44 to examine how Maryland's electric utility companies can support the transition to an electric transportation network. Maryland has set forth ambitious but necessary goals in this area, and your action to enable the electric utility companies to invest in technology, infrastructure, and customer programs and services will help Maryland quickly transition to an electric transportation network, providing significant benefit to Marylanders and our environment.

Maryland is one of ten states that has adopted California's Zero Emission Vehicle (ZEV) mandate under which automakers must sell an increasing percentage of ZEVs (i.e., battery-electric, plug-in-hybrid electric, and fuel-cell electric vehicles) through the 2025 model year. Today, just over 10,000 electric vehicles have been sold in Maryland. The state still needs to sell nearly 300,000 more ZEVs to meet its 2025 mandate requirements. The state must continue to facilitate legislative and regulatory policies that advance electric vehicle adoption. The legislature just passed the Clean Cars Act of 2017, which provides for a doubling of the amount of rebates available to Marylanders purchasing qualifying electric vehicles and increases the excise-tax credit for those vehicle purchases by 40 percent. According to a recent M.J. Bradley economic analysis presented to the PSC PC 44 EV working group, the potential economic benefit to Marylanders could reach nearly $34 billion if Maryland meets its long-term goals to reduce vehicle GHG emissions by 80 percent from 2006 levels by 2050.

The Maryland House of Delegates · 6 Bladen Street, Room 251 · Annapolis, Maryland 21401
410-841-3990 · 301-858-3990 · 800-492-7122 Ext. 3990

Electric utility companies can help play a transformative role in the adoption of electric vehicles and help ensure that these economic benefits are delivered to Marylanders. Specifically, electric utility companies can change consumer behavior by providing additional incentive-based programs and customer education and awareness efforts. As more of these cars are on Maryland roads and highways, we will all benefit from cleaner air that we breathe and a cleaner Chesapeake Bay, our most treasured natural and economic resource. Reducing tailpipe emissions, which account for nearly one-third of all carbon dioxide emissions, is a significant factor in achieving Maryland's greenhouse gas emission reduction targets.

Again, I applaud the Commission's work on advancing electric vehicle adoption in Public Conference 44. I believe that directing the electric utility companies to implement these additional programs will enable more Marylanders to purchase electric vehicles.

Sincerely,

Kumar P. Barve

THE MARYLAND HOUSE OF DELEGATES
ANNAPOLIS, MARYLAND 21401

January 18, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Public Conference 44 – Electric Vehicle Infrastructure Acceleration

Dear Chairman Hughes and Commissioners:

As members of the Maryland General Assembly, we write to convey our support of the Maryland Public Service Commission's (Commission) efforts to study and identify thoughtful and comprehensive approaches to support Maryland's effort to increase electric vehicle activity within the state. In 2007, Maryland became one of 10 current states to adopt California's Zero Emission Vehicles (ZEV) mandate, which requires vehicle manufacturers to sell an increasing number of ZEV's (battery-electric, plug-in hybrid-electric and fuel cell-electric vehicles) in the state and sets a goal to have 300,000 ZEVs on the road by 2025.

Currently, roughly 10,000 electric vehicles have been sold in Maryland. This number highlights the significant gap that exists between the State's electric vehicle goal and its current positioning relative to that goal. Additionally, the State does not currently have sufficient infrastructure to support the goal. We are encouraged by the Commission's efforts to address these needs through the work of Public Conference 44, the workgroup tasked to conduct the necessary research and recommendations for increased electric vehicle activity, purchases, and supporting infrastructure in Maryland. A movement toward ZEVs would also support the State's goal to reduce greenhouse gas emissions (GHGs) by 25 percent by 2020 as the transportation sector represents approximately one-third of all CO^2 emissions.

We are also supportive of and encouraged by Maryland public utility companies' interest and willingness to support an electric vehicle transportation network through infrastructure investment, customer incentive programs designed to remove possible economic barriers, and customer education and awareness outreach. We encourage the utilities to play a role in the electric vehicle space as an inclusive plan will only serve to ensure a well-crafted and well-executed approach to meet the State's 2025 goal and make an electric vehicle transportation network a reality for Maryland.

As members of the Legislature, we supported the Clean Cars Act of 2017, which doubles the amount of rebates available to Marylanders who purchase qualifying electric vehicles and increases the excise tax credit by 40 percent for the vehicles purchased. The work of Public Conference 44 is yet another vehicle to help spur EV adoption in Maryland. We offer our support of this worthy effort.

Sincerely,

Delegate David Fraser-Hidalgo - District 15

Delegate Kumar P. Barve – Chair, Environment and Transportation Committee

Delegate Jeff Waldstreicher – District 18

Delegate Benjamin F. Kramer – District 19

Delegate Aruna Miller – District 15

Delegate Shane Robinson – District 39

Delegate Andrew Cassilly – District 35B

Delegate Dana Stein – Vice-Chair, Environment and Transportation Committee

Pamela G Beidle

Delegate Pamela Beidle – District 32

Herb McMillan

Delegate Herb McMillan – District 30A

Delegate William G. Folden – District 3B

Delegate Clarence K. Lam – District 12

GlobalAutomakers

AUTO ALLIANCE
DRIVING INNOVATION®

January 18, 2018

SUBMITTED TO THE PC44 ELECTRIC VEHICLE WORK GROUP LEADER

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street, 16th Floor
Baltimore, Maryland 21202

RE: In Support of Petition for Implementation of a Statewide Electric Vehicle Portfolio

Dear Mr. Collins:

The Association of Global Automakers, Inc.[1] (Global Automakers) and the Alliance of Automobile Manufacturers[2] (Alliance) (collectively, "Associations") write in support of the "Proposal to Implement a Statewide Electric Vehicle Portfolio" being submitted by the PC44 Electric Vehicle Work Group Leader.

Together, our Associations represent around 99% of the new vehicle market, and our 23 automakers are collectively offering more than 35 models of electric-drive vehicles, including plug-in hybrid, battery, and fuel cell electric vehicles. We are just starting to see second generation ZEVs with longer ranges and better performance, and our automakers have publicly announced plans to offer more models in the coming months, and years. These vehicles are safe, reliable, efficient, fun to drive, and offered at very compelling prices, with automaker subsidized lease rates on some well-reviewed cars well below $100/month with zero down.

The state of Maryland is one of ten states that requires the sales of electric-drive vehicles, under the Zero Emission Vehicle mandate, at increasing volumes through 2025. This mandate is challenging, and while it puts requirements on the automakers, market readiness and customer acceptance are integral to the ability to expand sales. In 2017, sales of electric-drive vehicles represent barely 1% of the new vehicles sold in the state. With only about 11,000 electric-drive vehicles sold since 2011 in Maryland, the state has a long way to go in achieving its target of a cumulative 300,000 electric-drive vehicle sales by 2025.

This data highlights the challenge ahead and underscores the importance of a multi-faceted approach to help increase electric-drive vehicles sales, with efforts from all stakeholders, including utilities. Purchase incentives, such as the state's vehicle tax credit, campaigns to increase consumer awareness and

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[1] Global Automakers' members include Aston Martin, Ferrari, Honda, Hyundai, Isuzu, Kia, Maserati, McLaren, Nissan, Subaru, Suzuki, and Toyota. Please visit www.globalautomakers.org for further information.

[2] Alliance members include BMW, Chrysler, Ford, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz, Mitsubishi, Porsche, Toyota, Volkswagen, and Volvo. Please visit www.autoalliance.org for further information.

acceptance of the vehicles,[3] and development of electric charging *and* hydrogen refueling stations are necessary to preparing the market and supporting customers that choose to buy these vehicles. Studies have shown that a lack of consumer awareness and a lack of infrastructure are key barriers to electric-drive vehicle deployment. Studies have also shown that purchase incentives are necessary to generate customer interest and help minimize the higher costs of new technologies.

As the "fuel" distributor for plug-in electric vehicles, utilities must play a role in helping to develop a robust and sustainable market. Thus, our Associations support the efforts of the PC44 Electric Vehicle Work Group Leader to address electric-drive vehicle deployment barriers, enhance efficiency and reliability within the electric distribution system; and lower electricity use during high demand periods. These efforts will complement the deployment of electric-drive technologies and will help ensure customers who drive a plug-in electric vehicle can easily, readily and affordably recharge their vehicles.

In addition to supporting the overall Report, our Associations provide the following comments:

- Infrastructure Gap: As noted above, infrastructure is a key component in getting customers interested in electric-drive vehicles and addressing perceived issues, such as "range anxiety." In addition to addressing perceived range anxiety, visible public charging and workplace charging serves to increase consumer awareness of the technology. Finally, many customers reside in homes without access to charging (e.g., multi-unit dwellings (MUDs), homes with street parking, rental homes, etc.). For these customers, which are more prominent in underserved communities, public charging and specifically public DCFC is not just important, it is necessary for them to consider a plug-in electric vehicle.

  Thus, we are pleased to see that the PC44 Workgroup ran the EVI-Pro model to provide an initial understanding of the future needs for infrastructure in the state. The Department of Energy's Alternative Fuel Data Center shows the availability of 957 Level 2 and 172 DCFC chargers in Maryland.[4] This leaves a very large gap from the preliminary modeled results of 28,560 Level 2 and 1,036 DCFCs needed by 2025. Our Associations believe this demonstrates a desperate need for a coordinated and immediate effort by the utilities to assist in developing a competitive and readily-available charging network in the state.

- Benefits of the Proposed EV Portfolio: Our Associations agree with the benefits shown in the report (pages 26-28), including residential, multi-unit, workplace, non-residential, charger incentives, and others. There will also be overarching benefits associated with engaging the expertise and resources of important stakeholders in growing and expanding Maryland's electric-drive vehicle market. This still-young market needs ongoing investment from a variety of stakeholders, and we appreciate the efforts of the PC44 Workgroup in scoping ways for these three utilities to be involved.

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[3] The Northeast States for Coordinated Air Use Management, on behalf of the Northeast and Mid-Atlantic ZEV states, along with Global Automakers and the Alliance, on behalf of our member companies, will be launching a consumer awareness campaign in the coming months. Additional campaign partners, and campaign contributions, will be critical to the success of this campaign.

[4] https://www.afdc.energy.gov/locator/stations/.

In closing, we appreciate the Workgroup's hard work to date. We support the Workgroup's request to implement its statewide EV Portfolio according to the report and hope to see expeditious approval of the request by the Commission.

Thank you for your consideration of our remarks. In the event of any questions regarding this letter of support, our contact information is provided below.

Sincerely,

Julia M. Rege
Director, Environment & Energy
Association of Global Automakers, Inc.
1050 K St. NW, Suite 650
Washington, D.C. 20001
Phone: 202.650.5555

Steven Douglas
Senior Director of Environmental Affairs
Alliance of Automobile Manufacturers
1415 L Street, Suite 1190
Sacramento, CA 95814
Phone: 916.447.7315

CC: Marissa Paslick Gillett, Esq.
Kathy Kinsey, NESCAUM

City of Bowie

15901 Excalibur Road
Bowie, Maryland 20716

January 16, 2018

Mr. David Collins
Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, Maryland 21202

Dear Mr. Collins:

On behalf of the City of Bowie, I am writing to provide support for the State of Maryland's electric vehicle (EV) goals and for utility involvement in the EV marketplace. The City of Bowie is a diverse and vibrant community committed to its citizens, economy, and natural environment. The City of Bowie strives not only to be an environmentally progressive city, but to be a leader in Energy Conservation and Sustainable Practices.

In keeping with the City's commitment to the environment, the City of Bowie supports Maryland's strategy to advance the deployment of 300,000 plug-in EV's by 2025 in order to meet the state's goal to improve air quality, mitigate the effects of climate change and to protect public health. EV's that replace gas-powered vehicles improve the air as they do not release emissions of air pollutants and greenhouse gases; tailpipe emissions are a major contributor from gas-powered cars and trucks. This is important as Baltimore ranks among the highest across the nation for respiratory and asthma related illnesses.

A charging infrastructure needs to be in place to support the hundreds of thousands of EV's expected in the state. We urge the PSC to allow the utilities to play a role in this important initiative.

Many regards,

G. Frederick Robinson
Mayor
City of Bowie

218456

ORIGINAL

January 2, 2018

FILED

JAN 05 2018

PUBLIC SERVICE COMM OF MARYLAND

David Collins
Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, Maryland. 21202

Re: Support for BGE'S PC 44 Proposal

Dear Mr. Collins:

On behalf of Caves Valley Partners (CVP), I would like to enthusiastically extend my support for BGE's PC 44 Proposal. CVP has spent much of the past decade assembling and developing properties throughout Maryland. Our firm has successfully completed the development of many projects including the revitalization of Towson City Center, the award-winning project at 1111 Light Street (which houses the acclaimed tech incubator, Betamore) the Riverside Wharf medical office building, and the Hilltop Shopping Center.

CVP takes great pride in developing and investing in Maryland, and we believe this pride can be best shown throughout our current Stadium Square project located in Baltimore City. Stadium Square covers three (3) city blocks and is Baltimore's newest transformational mixed-use development. Upon completion, this $300M project will include 600 apartments; 375,000 square feet of office space; 70,000 square feet of street level retail space; a state-of-the-art park and green space; and parking for nearly 2,000 cars. From a Master Developers perspective, the execution of smart innovation and sustainability are key to the success of a project the size and scale of Stadium Square. One way of showing this innovation would be through the implementation of electric vehicle (EV) infrastructure.

EV charging infrastructure is essential in our developments located in underserved communities, such as the area surrounding Stadium Square. This area, known as Sharp-Leadenhall, would benefit from the PC 44 proposal given that environmental sustainability, public health, and air quality are a major concern for all of the residents of the community. On the commercial side, we have found that many of our prospects often inquire about the existence of EV charging stations as an amenity for their employees and their clients. Employee attraction and retention is critical for these organizations and Maryland needs to have the proper infrastructure in place to help these organizations succeed.

CVP | Caves Valley Partners

1 Olympic Place • Suite 1210 • Towson, MD 21204 • 410-427-6700 • Fax 410-427-6701 • CavesValleyPartners.com

Thank you for taking CVP's comments regarding PC 44 into consideration. We look forward to working with your office to make this proposal a reality.

Sincerely,

Arthur Adler
Managing Partner

CVP | Caves Valley Partners

1 Olympic Place • Suite 1210 • Towson, MD 21204 • 410-427-6700 • Fax 410-427-6701 • CavesValleyPartners.com

CLEAN AIR
PARTNERS
DC-MD-VA

November 7, 2017

David Collins
Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, Maryland, 21202

Dear Mr. Collins:

On behalf of Clean Air Partners, I am writing to provide support for the State of Maryland's electric vehicle (EV) goals and for utility involvement in the EV marketplace. Clean Air Partners is a public-private partnership that educates area residents in the metropolitan Baltimore-Washington region about the health risks associated with poor air quality and the impacts everyday actions have on the environment. For 20 years, Clean Air Partners has helped individuals and organizations take simple actions to improve air quality.

Clean Air Partners supports Maryland's strategy to advance the deployment of 300,000 plug-in EVs by 2025 in order to meet the state's goal to improve air quality, mitigate the effects of climate change, and protect public health. EVs that replace gas-powered vehicles improve the air as they do not release emissions of air pollutants and greenhouse gases; tailpipe emissions are a major contributor from gas-powered cars and trucks. This is particularly important as Baltimore ranks among the highest across the nation for respiratory and asthma related emergency room visits.

A charging infrastructure needs to be in place to support the hundreds of thousands of EVs expected in the state. It is important that all options be on the table. While the private sector will continue to play an important role, support from the utilities may be needed to provide adequate charging infrastructure. We urge the Public Service Commission to allow the utilities to play a role in this important initiative.

The region's improvements in air quality are a testament to the collaborative work and actions taken by many stakeholders; public and private organizations and individuals. Clean Air Partners will continue to work with its nearly 4,500 participants to promote simple actions to reduce their impact on the environment and public health, including the usage of EVs. Continued over the long-term, partnerships to educate the public about what those actions are,

777 N. Capitol Street, NE Suite 300 | Washington, DC 20002
www.cleanairpartners.net

will be an integral part of the solutions to improving the air in the greater metropolitan Baltimore-Washington region.

Thank you for taking our comments into consideration.

Sincerely,

Brian O'Malley
Chair, Clean Air Partners

CLEAResult®

January 19, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street, 16th Floor
Baltimore, Maryland 21202

RE: Petition for Implementation of a Statewide Electric Vehicle Portfolio

Dear Secretary Collins:

CLEAResult appreciates the opportunity to write in support of the PC44 Electric Vehicle (EV) Working Group proposal presented today. CLEAResult is the national leader in utility energy efficiency implementation, and as such, grasps the importance of managing and coordinating the integration of such a significant new technology into the electric grid. With rapid growth in the EV market projected for the next decade, Maryland is to be commended for its proactive approach to tackling the challenges and benefits that will come with the emergence of large-scale EV adoption.

The proposal before you appears to have widespread support across the array of stakeholders, aiming to balance goals for a robust private market with prudent ratepayer investment. The suggested approach of starting with targeted pilot programs administered by the state's utilities is sensible, giving market actors, customers, utilities and regulators time to learn and adapt to new offerings and answer the many questions that arise at the intersection of the energy and transportation sectors.

As described in the proposal, the likely benefits of a carefully planned EV infrastructure build-out in Maryland could result in a win-win across the board: lowering vehicle operating costs for owners, reducing electric bills for customers as utilities gain efficiencies and new business lines, and lowering GHG emissions. CLEAResult looks forward to working with all stakeholders to further the state's goals to design 21st electricity and transportation systems.

Sincerely,

Doug Lewin, Vice President, Regulatory Affairs and Market Development

9801 Guilford Rd., Ste 250 • Columbia, MD 21046 • Main 512.327.0092 • Fax 866.236.9505 • clearesult.com

Columbia Association

January 19, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

RE: Support for BGE PC44 Proposal

Dear Mr. Collins,

Columbia Association (CA) strongly supports BGE's PC44 proposal to the Maryland Public Service Commission (PSC) to provide incentives for electric vehicle (EV) charging station infrastructure. This is an opportunity to support increased EV adoption and cost effectively improve Maryland's air and water quality. Baltimore Gas and Electric (BGE) has the ability to reach its customers directly and impact sales of EVs by supporting infrastructure investment to make it more convenient for residents and commercial entities.

EV charging infrastructure is vital to the growth of the EV market and will lead to long-lasting reductions in greenhouse gas emissions. A primary reason that consumers do not purchase EVs is a perceived lack of charging stations and risk associated with range limitations. Increasing the availability of public charging stations increases the practicality of owning an EV and the distance an EV can travel from home.

CA currently manages five EV stations in the Columbia, MD community and incentives provided through BGE would improve our economic basis for additional investment in this infrastructure. CA strongly supports this proposal and appreciates the Maryland PSC's consideration of this vital issue.

Sincerely,

Jeremy Scharfenberg, CEM
Energy Manager
Columbia Association, Inc.
410-381-3269

January 18, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for PC 44 Proposal

Dear Mr. Collins:

On behalf of Downtown Annapolis Partnership, I would like to encourage the Maryland Public Service Commission to support the advancement of public charging infrastructure to support Electric Vehicle (EV) accessibility. Downtown Annapolis Partnership is a non-profit charitable organization, with a mission to sustain and strengthen the Annapolis business community. Being a waterfront attraction, we have a strong commitment to the environment while creating a unique Annapolis experience that draws visitors and residents into our shops, restaurants and galleries.

Electric utilities have the means and capabilities to improve the lack of charging infrastructure and the lack of consumer awareness to support EV adoption. The Annapolis business community supports this endeavor because of the environmental benefits, such as long-lasting emissions reductions, and the appeal that accessible public charging stations may have to our patrons and residents. Having accessible charging outlets on our downtown corridors will attract new visitors and, hopefully, inspire others to invest in EVs.

We look forward to supporting progressive approaches that make a strong impact to our local community's quality of life. The Downtown Annapolis Partnership strongly supports this proposal and appreciates the Maryland PSC's consideration as it addresses this vital issue.

Sincerely,

Erik Evans

Executive Director
Downtown Annapolis Partnership

EastportCivic.org
P.O. Box 3539
Annapolis, MD 21403

December 18, 2017

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

The Eastport Civic Association supports BGE's PC 44 proposal to the Maryland Public Services Commission to build the lacking infrastructure for electric vehicles. This is an opportunity to promote EV adoption and improve Maryland's air and water quality. BGE has the ability to reach its customers directly and impact sales of EVs by building the infrastructure to make it more convenient for residents.
EV charging infrastructure is vital to the growth of the EV market and will lead to long-lasting emissions reductions. A top reason that consumers do not purchase EVs is a perceived lack of charging stations. Public charging stations increase the practicality of owning an EVs and the number of places an EV can go.
As a community association, electric vehicles have a positive environmental impact on the Eastport community, providing residents with cleaner air and water.
Because of this and the reasons listed above, the Eastport Civic Association strongly supports this proposal and appreciates the Maryland PSC's consideration as it addresses this vital issue.

Sincerely,

Vic Pascoe, President
Eastport Civic Association

Economic Alliance of Greater Baltimore

January 8, 2018

218483

FILED

JAN 10 2018

PUBLIC SERVICE COMM
OF MARYLAND

David J. Collins
Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

The Economic Alliance of Greater Baltimore (EAGB) recognizes the importance of Maryland's environmental assets and the impact environmental initiatives have on our economy. The EAGB is a public/private partnership of industry, government and higher education leaders dedicated to advancing the global relevancy and market competitiveness of the Greater Baltimore region, and we believe that clean energy and improving our environmental awareness will continue to strengthen Maryland's economy.

In order to be a competitive market, the EAGB understands the value partnerships add to the landscape, and the need to support our partners as they contribute to the goals of advancing our region and state. Globally, consumers are seeking environmentally-conscious locations, companies and products, and it is imperative that we provide adequate infrastructure to meet these growing demands. Further, in so doing, we, as a region and state, will meet our own goals in our ongoing commitment to air quality, the Chesapeake Bay and the numerous environmental assets across the state.

It is in the EAGB's best interests to find and support solutions that will advance our economy in a responsible, thoughtful and strategic manner. We have had a long-term partnership with BGE because we value their ongoing commitment to the communities they serve, and their efforts to provide a range of opportunities for their customers. As such, EAGB readily supports BGE's PC 44 proposal, and know that BGE is well-positioned to equip Maryland for the anticipated Electric Vehicle (EV) market. Use of an EV is only possible with a strategic, "full service" approach to EV infrastructure, for which BGE is committed to, and qualified in, addressing. The EAGB studies markets around the world, and we know that providing this infrastructure to residents and visitors is no longer a luxury, but a requirement.

The BGE PC 44 proposal for developing solutions to address this ever-growing need for our community, our regional economy, and the environment has full collaboration and support from the EAGB.

Regards,

Shannon Landwehr
President & CEO

1200 Steuart Street, Unit C1B • Baltimore, MD 21230 • (410) 468-0100 • info@greaterbaltimore.org • www.greaterbaltimore.org

Edison Electric
INSTITUTE

Power by Association

VIA EMAIL

January 9, 2018

Chairman W. Kevin Hughes
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St., 16th Floor
Baltimore, MD 21202

Re: PC 44 Electric Vehicle Working Group

Dear Chairman Hughes,

The Edison Electric Institute (EEI) respectfully submits this letter to the Maryland Public Service Commission with regards to the PC 44 Electric Vehicle Work Group. EEI has been monitoring electric vehicle (EV) proceedings taking place across the country, and has appreciated the opportunity to provide the Commission with a national perspective on the importance of the electric company role in growing the EV market for all participants, integrating EV charging into the grid in a cost-effective manner, and protecting customer interests and maximizing value.

EEI is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. EEI's member companies, which include Baltimore Gas and Electric, Delmarva Power, Pepco, and Potomac Edison, deliver reliable, affordable and sustainable electricity that powers the economy and enhances the lives of all Americans.

Electric companies are well-positioned to make targeted and strategic investments in EV charging infrastructure that benefit the broader community and accelerate EV adoption. The lack

of EV charging infrastructure is one the primary barriers to widespread EV adoption.[1] In fact, EEI and the Institute for Electric Innovation (IEI) recently released a report forecasting EV sales to grow to seven percent of all new car sales by 2025, but found that approximately 2.2 million additional public charging ports will be needed to support this forecast – a roughly 30 to 40 times increase over the charging infrastructure available today.[2] Similarly, a concurrent deployment of charging infrastructure will be needed to meet Maryland's own goal of 300,000 zero emission vehicles on the road by 2025 – compared to about 10,300 on the road today.[3]

As states, including Maryland, develop policies to support the deployment of EVs and grow the market for all participants, electric companies should not only be permitted to participate in this space but can play an important role in designing programs that best meet the needs of their customers. Importantly, these investments can complement and accelerate other efforts underway to grow the EV market by third-parties and state governments, including Maryland's Electric Vehicle Recharging Equipment Rebate Program. At the end of the day, a healthy electric transportation market will only help to spur new entrants into the market that may offer innovative new products and business models.

As EV adoption grows, both the energy grid and the electric company's role as an integrator of energy resources becomes more important. Significant EV adoption without a coordinated or managed charging program could lead to capacity constraints on the grid. Conversely, programs that encourage charging to occur when the power grid has available capacity will minimize costs and help the grid operate more efficiently – effectively lowering the average system cost for all electric customers.[4]

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[1] See for example: National Renewable Energy Laboratory, *Consumer Convenience and the Availability of Retail Stations as a Market Barrier for Alternative Fuel Vehicles,* https://www.afdc.energy.gov/uploads/publication/56898.pdf.

[2] Edison Electric Institute and the Institute for Electric Innovation, *Plug-in Electric Vehicle Sales Forecast Through 2025 and the Charging Infrastructure Required,* June 2017, p. 7, available at http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20PEV%20Sales%20and%20Infrastructure%20thru%202025_FINAL%20%282%29.pdf.

[3] 10,330 Zero Emission Vehicles (ZEVs) registered in Maryland as of August 2017, according to the ZEV Sales Dashboard, https://autoalliance.org/energy-environment/zev-sales-dashboard/

[4] See for example: M.J. Bradley & Associates LLC, *Plug-in Electric Vehicle Cost-Benefit Analysis: Maryland,* http://mjbradley.com/sites/default/files/MD_PEV_CB_Analysis_FINAL.pdf.

EV charging can be managed through a variety of strategies, including consumer education, rate design, and various "smart charging" approaches that enable communication between the grid, the vehicle, and/or the charging equipment. It is important to remember that the electric company investment in charging infrastructure and EV programs affords them the opportunity to lay the groundwork for a variety of managed charging solutions such as these that will benefit all customers in the long run. The PC 44 Electric Vehicle Work Group has considered multiple approaches including time-of-use rates, charging equipment that allows for demand response, and demonstrations of other "smart charging" technologies, positioning the electric companies to evaluate which strategies work best for its customers.

Finally, electric company EV programs can drive outcomes that protect customer interests and maximize customer value. Electric company investment is appropriate because:

- Electric company investment in charging infrastructure enables more choices for customers;
- Electric company investment in charging infrastructure lowers the barrier to entry for customers by reducing the cost and difficulty of installation;
- A wide range of customers, such as homeowners and commercial property owners, and industry stakeholders, such as automakers and charging service providers, are increasingly asking electric companies for affordable, reliable, and easy-to-use charging infrastructure options;
- Electric companies can locate charging infrastructure in a way that is cost-effective for the energy grid and geographically useful for the charging needs of its customers. This system-level planning can help fill gaps that the private market may not;
- Electric companies can support EV charging in their service territories in a way that all customers benefit, which may include providing access in disadvantaged and low-income communities where private investments may be lacking;
- The additional electricity use from EV charging – if added to the system in a cost-effective manner – can reduce the average cost of service to all customers;
- Electric companies can maximize customer value by making investments that are targeted and phased to meet the needs of the local market.

The Maryland Public Service Commission has the opportunity to oversee electric company investments in EV programs and charging infrastructure that can grow the market for all participants, help integrate EV charging into the grid in a cost-effective manner, and drive outcomes that protect customer interests and maximize value. To the extent the PC 44 Electric Vehicle Work Group leads to electric company proposals that support these goals, we encourage the Commission to consider approval.

Respectfully submitted,

Philip D. Moeller
Executive Vice President, Business Operations
Group and Regulatory Affairs
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2696
202-508-5500
PMoeller@eei.org

CC: Commissioner Michael T. Richard (via email)
Commissioner Anthony J. O'Donnell (via email
Commissioner Odogwu Obi Linton (via email)
Commissioner Mindy L. Herman (via email)
Marissa Gillett, Senior Advisor to the Chairman (via email)
Jeannie Haddaway-Riccio, Deputy Chief of Staff, Office of the Governor (via email)
Mary Beth Tung, Director, Maryland Energy Administration (via email)

ELECTRIC LEAGUE OF MARYLAND, INC.

ELM

Serving all of MD since 1955

218455

FILED

JAN 05 2016

PUBLIC SERVICE COMM OF MARYLAND

ORIGINAL

Mr. David Collins
Executive Secretary

I am writing to support the BGE Proposal known as PC 44 to Help the Electric Vehicles in Maryland . I have worked with the BGE many years ago with Mr Dave Brown on the Electric Cars that first came to Maryland. We helped BGE Establish Charging Stations to contribute to the Electric Car race. This happened long before most people even knew they existed.

I fully support the BGE and the members of The Electric League of Maryland working

- the following items needed for EV owners.
- Provide support for Proper Installation of Home Charging Stations in accordance with
- the NEC .
- Provide support for Non- Residential Stations in Commercial areas as work place.
- Provide support for Proper installation of Commercial Fleet operation in accordance
- with the NEC.
- Provide Proper Public Charging Stations for the support of Owners of EV's,
- installed with Co operation of BGE and Electrical Inspection.
- Help owners of EV equipment BGE will Assist Greater Awareness of EV's

Charging Solutions and true cost of Ownership.

The EV's will help Clean the Air in the State of Maryland and Help the Cheasapeak Bay Grow our Famos Crabs and Seafood. The Eliminationo of Auto and Truck Emissions to Help Reduce the Asthma and resperatory conditions.

I urge the Public Service Commision to Allow BGE to Help with this PC 44 initiative. I look Forward to Clean Air and Safe installation of Power Stations in Home and Commerical areas. Thank You Very Much!

Peter Elmo President of
B. Lipman and Associates
The Electric League of Maryland

2706 Hunting Ridge Ct
Baldwin Md 21013
Cell 443-271-3891
Email Vincent42.pe@gmail.com

ENERGETICS

January 18, 2018

Marissa Gillett
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, MD 21202
marissa.gillett@maryland.gov

Re: Energetics support for the Maryland Public Service Commission and local Maryland utilities involvement in electric vehicle market development

Dear Ms. Gillett:

Energetics would like to encourage the Maryland Public Service Commission (PSC) efforts to jumpstart the critically-needed development of the early electric vehicle (EV) market. The PSC, along with local utilities are uniquely qualified to address several of the EV market barriers we are currently facing, including a lack of infrastructure and a lack of education for local stakeholders on EVs. Utilities specifically, have an unprecedented opportunity to educate their customers on the benefits of EVs, how they can save money and energy, as well as improve the local environment.

Maryland has long shown interest in taking steps to advance the state's transportation sector, as well as reduce the sector's impact on the environment. Recently, Maryland joined a 13 partner European-North America Alliance at the Paris Global Climate talks (COP21) that will drive the global transition to zero-emission vehicles (ZEVs) by 2050, demonstrating their commitment to reducing emissions. And after the United States departure from the Paris Accord, Baltimore and other Maryland cities joined the "We Are Still In" movement in support of cleaner air. We look forward to Maryland continuing to "walk the talk" through this initiative.

Baltimore's metro area continues to struggle with environmental challenges in several sectors and electric transportation systems can significantly reduce emissions. Air quality remains is a considerable issue in Maryland. In a study released in 2013, researchers at the Massachusetts Institute of Technology found that emissions from cars, trucks, industrial smokestacks, trains, boats and commercial heating systems contribute to the death of 113 people per 100,000 population per year in Maryland. This is a higher percentage of the population that die prematurely than any other state.

This effort can also connect with other innovative transportation strategies in Maryland, including first and last mile solutions, autonomous vehicles, and central mobility hubs. In recent years, the City of Baltimore has become increasingly congested; it takes nearly 31 minutes on average to get to or from work in the Baltimore region, the sixth-longest commute in the country, according to the analysis of 2013 Census survey data. Only workers in such notoriously congested areas such as New York City, Washington DC, Southern California and San Francisco face longer average commutes.

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The transportation strategies above can help mitigate these numbers, as well as improve driver and pedestrian safety, but an established EV charging infrastructure is the key in taking the first steps. While a mix of transportation solutions can help Maryland meet its transportation and environmental goals, the build-out of EV infrastructure is a step toward achieving both objectives. This investment from the PSC can serve as a catalyst for electric vehicle infrastructure deployment and education. Energetics looks forward the successes of Maryland PSC's EV Market Development program. If you would like to talk more about our support of this initiative, please contact me via phone at 410-953-6222 or via email at tperrot@energetics.com.

Sincerely,

Thomas L. Perrot, PMP
Vice President
Sustainable Transportation Solutions

Mayor

Michael C. O'Connor

The City of Frederick
Maryland

Aldermen

Kelly Russell
President Pro Tem

Derek T. Shackelford

Roger A. Wilson

Donna Kuzemchak

Ben MacShane

January 18, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Dear Mr. Collins:

The City of Frederick, now the second-largest municipality in Maryland, has completed a Plug-In Electric Vehicle Charging Infrastructure Implementation Plan, which highlights data and technical analyses, information on various ownership models, costs and benefits, suggested general locations for stations, a review of existing City codes, and an implementation strategy.

The City believes that electric vehicles are critical to maintaining good air quality and reducing greenhouse gas emissions in Frederick and throughout the region. Electric vehicle infrastructure linking large and small municipalities is necessary to reduce range anxiety and to support regional improvements on transportation and air quality initiatives.

Charging infrastructure will be an important determination in the speed of electric vehicle adoption. The City's Plan estimates a need of nearly 120 public chargers by 2020 to meet increasing demand. This effort will encourage electric vehicle purchases and provide positive examples for residents and businesses to follow. The City of Frederick supports the proposal for coordinated statewide electric vehicle infrastructure development.

Sincerely,

Michael O'Connor
Mayor

GARVER DEVELOPMENT GROUP
Real Estate Development and Consulting
1340 Smith Avenue, Suite 200, Baltimore MD 21209 phone 410-528-1131 fax 410-779-1330 www.GarverDevelopment.com

December 27, 2017

218454

FILED
DEC 29 2017
PUBLIC SERVICE COMM
OF MARYLAND

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

I am writing to support the captioned proposal by BGE. My wife and I are on our second EV, having just traded in the Leaf we owned for three years for a Chevy Bolt.

The high levels of asthma and other respiratory ailments in our region are reason enough to reduce internal combustion-powered vehicles in favor of EV's. There are other reasons of course, not least among them that these cars are fun to drive!

Having adequate infrastructure is most important. We traded the Leaf because of its limited range. My wife's commute changed, so that she could not go round trip on a charge. Charging stations at her employer (U MD college Park) are limited, and competitive to get.

Please support this proposal so that Maryland's EV infrastructure will improve.

Thank you for your consideration,

Peter Z. Garver

President

GENERAL MOTORS

Britta K. Gross Director
Advanced Vehicle Commercialization Policy
Environment, Energy & Safety Policy

General Motors Global Headquarters
MC: 482-C30-C76
300 Renaissance Center
Detroit, MI 48265-3000

January 8, 2018

Marissa Gillett
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, MD 21202
marissa.gillett@maryland.gov

Re: GM Support for Baltimore Gas & Electric Involvement in EV Market Development

Dear Ms. Gillett:

General Motors LLC (GM) would like to encourage the Maryland Public Service Commission to support Baltimore Gas & Electric's (BGE) efforts to actively engage in the critically-needed development of the early EV market. BGE is uniquely qualified to address 2 key EV market barriers we are currently facing: a lack of compelling EV charging infrastructure and a general lack of EV awareness.

EV charging infrastructure today has not attracted sufficient investment to establish a compelling foundation of EV charging stations. This market will become more viable and competitive over time, but this early market currently requires additional investment to close the infrastructure gap and establish a network of charging stations that is highly visible to consumers and drives consumer-confidence in the ability to drive EVs anywhere in the state. EV infrastructure is also key to attracting innovative and advanced mobility solutions to Maryland, such as car-sharing, ride-hailing, and autonomous vehicles. The ability to introduce and grow these advanced mobility services relies on a robust foundation of EV charging infrastructure, especially DC fast-charging. The lack of EV awareness in the market can also be addressed by utilities through consumer-facing EV programs, such as programs that offer home charging incentives and services. Electric utilities are uniquely positioned to reach every consumer in Maryland with programs that grow consumer awareness of EVs through education and outreach. Both EV infrastructure and EV outreach are critically important to the successful growth of EV-adoption in Maryland.

GM has invested billions of dollars to develop electrification technologies, including the state-of-the-art Chevrolet Volt and Chevrolet Bolt EV, which has swept the industry's most prestigious car

awards, including North America Car of the Year, Motor Trend's® 2017 Car of the Year, MotorWeek's 2017 Drivers' Choice "Best of the Year" Award, and Green Car Journal's Green Car of the Year. The Bolt EV is the industry's first affordable, long-range EV with an EPA estimated range of 238 miles-per-charge, and is now available at Chevrolet dealers across all 50 states, including Maryland. This advanced technology will require more widespread charging infrastructure to convince consumers that EVs can be driven anywhere they need to go. Thus, the urgency to rapidly expand EV charging infrastructure, and learn from these investments, in Maryland.

Consumer-friendly home, workplace, and public EV charging infrastructure is vital to the growth of the EV market and will lead to long-lasting emissions reductions that increase over time as the market expands. Maryland's relatively low electricity prices mean that electric vehicles are an important economic driver for Maryland – that is, EVs benefit not only the individual EV driver (e.g. lower fuel costs), but also benefit Maryland more broadly (e.g. the fuel cost savings translate into more available spending on other Maryland goods and services). Thus, the support of a near-term enabler of EV market growth is good for Maryland.

BGE will be able to target infrastructure where it will be most beneficial to consumers and can be used to inform subsequent infrastructure programs in the state. And the direct engagement of BGE in the strategic planning and execution of EV charging solutions will ensure the most cost-effective and grid-responsible EV charging solutions.

GM greatly appreciates Maryland's commitment to accelerate the strategic transition to transportation electrification and all efforts by the Maryland PSC to help drive this emerging market in Maryland. The speed with which EV charging infrastructure can be expanded will determine the pace of EV adoption in Maryland as well as the ability to drive towards even more advanced transportation technologies.

Sincerely,

Britta K. Gross, Director
Advanced Vehicle Commercialization Policy
britta.gross@gm.com
(586) 596-0382

Cc: David Collins, Executive Secretary, Maryland Public Service Commission
David.Collins@maryland.gov

GREATER BALTIMORE COMMITTEE
Regional business leaders creating a better tomorrow...today.

Stephanie C. Hill, *Chair*
Lockheed Martin

Donald C. Fry
President & CEO

November 20, 2017

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Shaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Dear Mr. Collins:

The Greater Baltimore Committee (GBC), a non-partisan, independent, regional business advocacy organization comprised of hundreds of businesses, educational institutions, nonprofit organizations and foundations, expresses its strong support for utility involvement in the development of electric vehicle (EV) infrastructure.

Electric vehicles are a critical part in the state of Maryland's pursuit of providing improved air quality and reduced greenhouse gas emissions. Electric vehicles are a practical alternative for daily commutes, produce zero emissions, and are cost-competitive with gasoline-powered cars. Although the adoption of electric vehicles is growing, many consumers are choosing not to opt for these vehicles partly due to range anxiety—the fear of being stranded due to inadequate access to charging infrastructure. Access to charging must be expanded to achieve environmental goals.

Utility companies are well suited to accelerate the development of electric vehicle infrastructure. Utilities are experts in managing electrical infrastructure and have reliable communications processes with consumers and the Public Service Commission. Most importantly, they can facilitate market development through established connections with suppliers. There is likely no other industry group that can match the efficiency, scale, and expertise of utility companies in this initiative.

The GBC has a rich legacy of working with government to find solutions to problems that have a negative effect on quality of life. The participation of utility companies to develop elective vehicle infrastructure will accelerate the process of EV adoption empowering the state to achieve its environmental goals. Therefore, we urge the Public Service Commission to allow utilities to play an expanded role in this process. Thank you for considering our comments.

Sincerely,

Donald C. Fry
President and CEO

111 South Calvert Street • Suite 1700 • Baltimore, Maryland 21202-6180 • 410-727-2820 • 410-539-5705 (fax) • www.gbc.org

HARFORD COUNTY CHAMBER OF COMMERCE

January 8, 2018

218499

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

BGE is an active supporter of electric vehicle (EV) adoption and has worked to help communities meet their EV goals. In addition, BGE is actively engaged in a number of Maryland initiatives seeking to increase the adoption of electric vehicles.

The Harford County Chamber of Commerce's position is that BGE's current proposal will support the development of a robust, regional EV market and charging infrastructure. The programs and incentives will help overcome driver concerns about availability and access to charging and cost barriers for companies and individuals to invest in charging equipment.

The easing of barriers to charging should heighten interest and purchases of vehicles, growing the market overall for all participants. Increased EV adoption will in turn create opportunities for charging and support investments by EV market providers beyond the BGE proposals.

Because of this, EVs will make significant contributions to Maryland's clean air and clear water goals, which benefits everyone in the state.

The Harford County Chamber of Commerce recognizes the value of EV adoption and initiatives in the business community. EV adoption by businesses will reduce costs and, therefore, help create a vibrant local economy.

For these reasons, I strongly support BGE's PC 44 Proposal and hope that the Maryland Public Services Commission carefully considers and approves the plan.

Sincerely,

Angela Rose
President and CEO
Harford County Chamber of Commerce

FILED
JAN 11 2018
PUBLIC SERVICE COMM
OF MARYLAND

108 South Bond Street
Bel Air, Maryland 21014
Ph. 410.838.2020 | Fx. 410.893.4715
www.harfordchamber.org

January 18, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for PC 44 Proposal

Dear Mr. Collins:

The Inner West Street Association of Annapolis hopes to encourage the Maryland Public Service Commission to support the advancement of public charging infrastructure to support Electric Vehicle (EV) accessibility. Our organization represents local businesses on West Street and manages Annapolis' Arts and Entertainment District. We have worked hard to transform the culture of this section of Annapolis and we continuously look for ways to make the area more inviting to visitors and locals.

We believe that promoting EV adoption is a strong mechanism to reaffirm our commitment to the environment and to innovative forward-thinking concepts. We also believe that having readily available and accessible charging infrastructure would appeal to many of our consumers. This could help boost the local economic benefit to many restaurants within this district.

To accelerate this effort, electric utilities should play a significant role since they are best suited to jumpstart the installation of charging infrastructure and to educate consumers on EV adoption. Public charging stations are essential to counter the perception many consumers have that EVs are not practical. The infrastructure to support EVs must be in place and sustainable for the EV market to grow.

The Inner West Street Association looks forward to seeing our state advance in making EV adoption more reachable through embracing public charging stations.

Sincerely,

Jody Danek

President
Inner West Street Association

NESCAUM
www.nescaum.org

Northeast States for Coordinated Air Use Management
89 South Street, Suite 602 Boston, MA 02111
Phone 617-259-2000 Fax 617-742-9162
Arthur N. Marin, Executive Director

January 19, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street, 16th Floor
Baltimore, Maryland 21202

Dear Mr. Collins:

The Northeast States for Coordinated Air Use Management (NESCAUM) writes in support of the Public Conference 44 ("PC 44") Electric Vehicle Work Group ("EV Work Group") Proposal to Implement a Statewide Electric Vehicle Portfolio of transportation electrification programs.

NESCAUM is the regional association of state air pollution control agencies in the six New England States, New Jersey and New York. A significant focus of NESCAUM's work is on removing barriers to widespread transportation electrification in the Northeast Corridor states and supporting states that have adopted zero emission vehicle (ZEV) regulatory programs requiring auto manufacturers to sell increasing numbers of ZEVs. In 2013, the Governors of Maryland and seven other states signed a Memorandum of Understanding (MOU)[1] under which they committed to collectively deploy 3.3 million ZEVs by 2025 and form a Multi-State ZEV Task Force to work collaboratively on a wide range of initiatives to accelerate growth of the EV market. In its role as facilitator to the ZEV Task Force, NESCAUM has worked closely with Maryland and the other ZEV states to ensure the successful implementation of the ZEV regulatory programs. Utility investment in EV charging infrastructure and consumer outreach, and adoption of rate structures that benefit both consumers and the grid continues to be a top priority of the ZEV Task Force.

In Maryland and the other ZEV MOU states, transportation electrification is a key climate strategy. The transportation sector now accounts for roughly one-third of greenhouse gas (GHG) emissions in the state. Dramatic reductions from this sector are essential if Maryland is to achieve its 2030 and 2050 goals to reduce GHG emissions by 40 and 80 percent, respectively, from 2006 levels. Modeling by NESCAUM and others demonstrates that wide-scale deployment of EVs operating on low carbon electricity is the only viable pathway to achieving the science-based GHG emission reductions needed from this sector.

[1] The other ZEV MOU states are California, Connecticut, Massachusetts, Oregon, New York, Rhode Island and Vermont.

Inadequate public, semi-public and workplace charging options and a lack of consumer knowledge and awareness of EV technology remain key barriers to mainstream adoption of EVs. The four utilities serving Maryland residents – Baltimore Gas and Electric Company, Delmarva Power & Light Company, Potomac Electric Power Company, and the Potomac Edison Company – have collectively proposed five-year rate-based investment programs that will deploy 24,000 new charging stations, raise consumer awareness and interest in electric vehicle technology and provide valuable data to inform rate design and the future build-out of the EV charging network.

Increased market penetration of electric vehicles would generate significant cumulative net economic benefits over time. A recent Maryland-specific analysis by M.J. Bradley & Associates projects cumulative state-wide EV owner, ratepayer, and societal environmental benefits of more than $34 billion by 2050 if EV market penetration in Maryland proceeds at the pace required to achieve the state's long-term goal for an economy-wide GHG emission reduction of 80% by 2050[2].

A growing number of utilities and energy regulators are recognizing the grid and ratepayer benefits of transportation electrification and utility investment in these programs. In the Northeast Corridor, energy regulators in Delaware[3], the District of Columbia[4], Massachusetts[5,6] and Rhode Island[7] have approved or are considering rate-based investments in a variety of EV charging infrastructure and other transportation electrification programs.

While states, automakers, and, private sector electric vehicle supply equipment (EVSE) providers, have made progress over the past five years in expanding EV charging infrastructure, the existing Maryland network of roughly 1,100 public charging outlets falls far short of the tens of thousands of outlets that will ultimately be needed in the state to promote widespread adoption and fuel the hundreds of thousands of EVs the state envisions on its roads over the course of the next decade. Neither government, nor automaker resources are available to close this gap, and there is presently no economically viable private sector business model for infrastructure investment on the scale that is needed without utility participation. The availability of ZEV charging infrastructure funds through the VW settlement can serve as a complement to, but not a substitute for, longer-term investments by utilities in transportation electrification. The coordinated portfolio of state-wide investments envisioned by the EV Work Group proposal is critical to the successful build-out of the charging network, can improve the business case for third party operators, and ultimately, lead to a competitive EV charging market that will benefit consumers.

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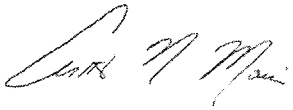
[2] Lowell, Dana et al. *Electric Vehicle Cost-Benefit Analysis, Plug-in Electric Vehicle Cost-Benefit Analysis: Maryland*, MJB&A (Dec. 2016).
[3] Docket No. 17-1094 at https://delafile.delaware.gov/AdvancedSearch/AdvancedSearchDocket.aspx
[4] Docket No. FC 1143 at https://edocket.dcpsc.org/public/search
[5] http://170.63.40.34/DPU/FileRoomAPI/api/Attachments/Get/?path=17-05%2f1705_Final_Order_Revenue_Requi.pdf
[6] Docket No. 17-13 at http://web1.env.state.ma.us/DPU/Fileroom/dockets/bynumber.
[7] Docket No. 4770 at http://www.ripuc.org/eventsactions/docket/4770-NGrid-PSC-Book1of3.pdf

NESCAUM urges the Maryland Public Service Commission to approve implementation of a coordinated state-wide portfolio of rate-based transportation electrification programs. Such programs are vitally important to the successful implementation of the Maryland ZEV regulation and the state's GHG reduction goals.

Sincerely,



Arthur N. Marin
Executive Director
NESCAUM

cc: Marissa Paslick Gillett, Senior Advisor to the Chairman
Ben Grumbles, Secretary, MDE
Earl Lewis, Deputy Secretary MDOT

January 17, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

BGE is an active supporter of electric vehicle (EV) adoption and has worked to help communities meet their EV goals. In addition, BGE is actively engaged in a number of Maryland initiatives seeking to increase the adoption of electric vehicles.

I believe that BGE's current proposal will support the development of a robust, regional EV market and charging infrastructure. The programs and incentives will help overcome driver concerns about availability and access to charging and cost barriers for companies and individuals to invest in charging equipment.

The easing of barriers to charging should heighten interest and purchases of vehicles, growing the market overall for all participants. Increased EV adoption will in turn create opportunities for charging and support investments by EV market providers beyond the BGE proposals.

Because of this, EVs will make significant contributions to Maryland's clean air and clear water goals, which benefits everyone in the state.

I would be able to consider an EV if my apartment complex had charging stations. I currently work for a university that is primarily a commuter school. We currently have close to 2,000 students in total with only four charging stations.

For these reasons, I strongly support BGE's PC 44 Proposal and hope that the Maryland Public Services Commission carefully considers and approves the plan.

Sincerely,

Mark A. Bell

Mark A. Bell

218481

FILED

JAN 10 2018

PUBLIC SERVICE COMM
OF MARYLAND

January 3, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Letter of SUPPORT for BGE's PC 44 Proposal

Dear Executive Secretary Collins and Commission Members:

I write to you as the lead developer behind Port Covington, a 235-acre master-planned, mixed-use redevelopment project, with a prime location on the waterfront in Baltimore City. As one of the largest urban renewal efforts in America, the redevelopment of Port Covington will have a fundamental and far-reaching positive impact on Baltimore, its economy and its future. At completion, this 25-year project will include: up to 18 million square feet of new, mixed-use development; 2.5 miles of restored waterfront; and 40 acres of parks and green space for Baltimore City. It is expected to generate thousands of new jobs, new businesses, better transit, more public parks, improved access to the waterfront, new space for manufacturing, fresh opportunities for innovation and entrepreneurship and more for Baltimore City residents and its local workforce.

According to latest estimates, the Port Covington redevelopment is expected to generate over $14 billion in economic activity and 90,000 jobs from private-sector construction effects for the state of Maryland. Once Port Covington is fully developed, the business and residential activities occurring in the development will annually support over $8 billion in economic activity and over 50,000 permanent jobs for the state.

Port Covington is committed to using its scale and inventive culture to find innovative ways to protect and preserve our environment. As a neighborhood of the future, constructed from the ground-up with smart infrastructure, Port Covington is an ideal place for electric vehicles (EV): a place where new forms of transportation will use technology to provide convenient mobility while reducing air pollution and other environmental impacts. Electric vehicles are a key component of the mobility and transit vision for Port Covington, and having the appropriate charging infrastructure throughout the area will be critical.

We are supportive of Maryland's ambitious EV goals and hope Port Covington can be a part of our state's environmental achievements. I urge you to support BGE's proposal for electric vehicle and vessel infrastructure.

Very truly yours,

Marc D. Weller
President

SemaConnect

January 17, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for the BGE, PHI/Delmarva and PE EV Infrastructure Proposals

Dear Mr. Collins:

SemaConnect applauds the Maryland Public Service Commission's efforts in PC44 to evaluate opportunities to advance EV adoption to help meet the State ZEV and Clean Air goals, work with utilities to expand charging infrastructure and help customers manage the impact of EV charging on the grid.

SemaConnect is a Maryland grown company, based in Bowie, Maryland. We are a leading provider of electric vehicle amenities to the North American commercial and residential property market and provide electric vehicle charging equipment, services and support to commercial customers and property managers across the United States.

I believe the EV market and the needed charging infrastructure will be well served by the initiatives proposed by the Maryland utilities. These initiatives will enable the EV market to grow and create new opportunities and jobs.

The programs and incentives will help overcome driver concerns about availability and access to charging and cost barriers for companies and individuals to invest in charging equipment.

The easing of barriers to charging should heighten overall interest in and purchases of vehicles, growing the overall market for all participants. Increased EV adoption will increase demand for charging, which will provide opportunities for investments by EV market providers beyond the BGE and Maryland utility proposals.

As a Maryland resident and CEO of SemaConnect, I feel that it is paramount that we not only meet ZEV and Clean Air goals in Maryland, but that we aim to surpass them.

For these reasons, I strongly support the Maryland utilities' proposal and hope that the Maryland Public Services Commission carefully considers and approves the plan.

Sincerely,

Mahi Reddy

Mahi Reddy, CEO, SemaConnect

www.SemaConnect.com
4961 Tesla Drive, Bowie, MD, 20715 • (800) 663-5633

December 18, 2017

Marissa Gillett
Senior Commission Advisor to the Chairman
Maryland Public Service Commission
William Donald Schaefer Tower
6th St. Paul St
Baltimore, Maryland 21202

Dear Ms. Gillett:

Tesla appreciates the efforts by Maryland's Public Service Commission and Staff, utilities and stakeholders in PC 44 to identify ways to accelerate the transition to electric vehicles (EV). Significant charging infrastructure investments will be necessary if Maryland is to meet its goal of 300,000 plug-in EVs by 2025. We are encouraged to see Maryland's utilities are seeking to play an active role in deploying charging infrastructure to support the growth of EVs in the State.

With a century of experience in its communities and with electric infrastructure, Maryland's electric utilities can leverage their experience to help ensure EV drivers have convenient places to charge, particularly in complex and underserved areas such as multi-unit dwellings and urban centers. Utilities can also play a critical role in helping maximize the benefits of EVs to all ratepayers, not just those with EVs. For example, utilities can send price signals and educate customers about optimal ways to charge their vehicle, which reduces the operational costs of EVs and puts downward pressure on rates for all ratepayers as electric system costs are spread out over more kilowatt-hours.

The potential benefits of greater EV adoption in Maryland are significant. In an analysis earlier this year, MJ Bradley & Associates estimated that by 2030, each plug-in EV in Maryland would provide $230 of net present value benefits annually. Of those benefits, the EV owner would have a benefit of $94/year in lower operational costs, and utility customers would have a benefit of $80/EV/year due to higher utility revenues from EV charging obviating the need for future rate increases.

The efforts of utilities to begin developing EV program ideas and proposals are timely. Although EVs make up a small share of total vehicle sales, EV sales have increased year over year, and more plug-in EV models are being made available. We encourage you to continue the collaborative framework fostered in the PC 44 process, and to urge Maryland's electric utilities to play an active role in ensuring charging infrastructure keeps pace with the growth of EVs.

Thank you for your consideration.

Sincerely,

Patrick Bean
Associate Manager, Energy Policy and Business Development
1050 K Street NW, Suite 100
Washington, DC 20001

TRADEPOINT ATLANTIC

218525

January 10, 2018

FILED

JAN 16 2018

PUBLIC SERVICE COMM OF MARYLAND

David J. Collins, Executive Secretary
Maryland Public Service Commission
6 Saint Paul Street
Baltimore, MD 21202-6806

Dear Mr. Collins and Members of the Commission:

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins:

Tradepoint Atlantic (TPA), the owner, manager and developer of Sparrows Point, the former home of Bethlehem Steel in Southeast Baltimore County urges the Maryland Public Service Commission to support BGE's PC 44 proposal.

BGE is proposing a project that aims to address market barriers most relevant to the electric vehicle (EV) market today, namely the lack of charging infrastructure and the lack of consumer awareness. This proposal is an opportunity to invest strategically in forward-looking infrastructure that will promote EV adoption which in turn will help Maryland meet both its air and water quality goals.

As TPA works on implementing our redevelopment plan for Sparrows Point, BGE's PC 44 proposal will encourage the installation of EV charging stations throughout our park. As we develop a 21st century center for logistics and trade, there should be a 21st century energy network that supports the use of alternative energy products such as EVs. A program as proposed by BGE that will actively build out and promote alternative energy infrastructure will help address the consumer perception of scarce EV charging options that all too often discourage consumers from exploring alternative energy vehicles.

EV charging infrastructure is vital to the growth of the EV market and will lead to long-lasting emissions reductions. This positive environmental impact will grow as EVs are adopted and gas-fueled vehicles are replaced. Because of this, EVs will make significant contributions to Maryland's clean air and water goals, on top of helping the state meet its commitment to having 300,000 EVs on the road by 2025.

As a sustainable community partner, TPA applauds BGE's leadership in investing in alternative energy infrastructure. We strongly support this proposal and appreciate the Maryland Public Service Commission's favorable consideration as it addresses this vital issue.

Sincerest Regards,

Aaron Tomarchio
Senior Vice President
Administration & Corporate Affairs

WATERFRONT PARTNERSHIP OF BALTIMORE

January 15, 2018

David J. Collins, Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 Saint Paul Street, 16th Floor
Baltimore, MD 21202

Re: Support for BGE's PC 44 Proposal

Dear Mr. Collins and Commissioners;

The Waterfront Partnership of Baltimore Inc. is writing in support of BGE's PC 44 proposal. Our organization is dedicated in creating and managing a world-class destination at Baltimore's Waterfront while inspiring a cleaner, greener future for our neighborhoods, streams, and harbor. The development of electric vehicle (EV) infrastructure stands to be a transformative investment for Baltimore's ongoing sustainable development.

Electric utility involvement in EV charging stations will not only enhance the City's economic growth, reduce air pollution and greenhouse emission, but will also support statewide goals for both air and water quality. Maryland signed the Zero Emission Vehicle Memorandum to have 300,000 zero-emission vehicles (ZEV) on the road by 2025. Today, just over 10,000 electric vehicles have been sold in Maryland. Therefore, electric utilities can play a critical role in not only accelerating the creation of a robust charging network to support large-scale deployment of EV, but also change consumer behavior by providing additional incentive based programs and customer education and awareness efforts.

The Waterfront Partnership worked closely with the City and others to bring the Charm City Circulator, a free shuttle service featuring 18 clean-energy electric hybrid buses travelling on three popular downtown and Waterfront area routes. This proposal would add to the city's electric vehicle infrastructure and contribute to the advancement of sustainable travel.

BGE has been and continues to be an active supporter for EV's and for helping our communities meet their EV goals. Therefore, we urge the Public Service Commission to allow utilities to play an expanded role in this process. Thank you for considering our comments.

Sincerely

Laurie Schwartz, President

January 18, 2018

Mr. David Collins
Executive Secretary
Maryland Public Service Commission
William Donald Schaefer Tower
6 St. Paul St, 16th Floor
Baltimore, Maryland 21202

Dear Mr. Collins:

On behalf of the West Laurel Civic Association (WLCA, a community of 1900 homes in Prince George's and Montgomery counties, of which I am president), I am writing to provide support for the State of Maryland's electric vehicle (EV) goals and for utility involvement in the EV marketplace.

The WLCA (and I personally) supports Maryland's strategy to advance the deployment of 300,000 plug-in EV's by 2025 in order to meet the state's goal to improve air quality, mitigate the effects of climate change and to protect public health. EV's that replace gas-powered vehicles improve the air as they do not release emissions of air pollutants and greenhouse gases (assuming that coal is a negligible source of the utility's energy); tailpipe emissions are a major contributor from gas-powered cars and trucks. This is important as Baltimore ranks among the highest across the nation for respiratory and asthma related illnesses.

A charging infrastructure needs to be in place to support the hundreds of thousands of EV's expected in the state. We urge the PSC to allow the utilities to play a role in this important initiative.

Many regards,
Barbara Sollner-Webb
President, West Laurel Civic Association
home: 17200 Melbourne Dr, Laurel MD 20707, bsw@jhmu.edu, 301-604-5610

Barbara Sollner-Webb