

**BEFORE THE  
PUBLIC SERVICE COMMISSION OF MARYLAND**

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**IN THE MATTER OF THE APPLICATION  
OF POTOMAC ELECTRIC POWER  
COMPANY FOR AN ELECTRIC  
MULTI-YEAR PLAN**

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Case No. 9655

**Direct Testimony of**

**Courtney Lane**

**On Behalf of**

**Office of People's Counsel**

**March 3, 2021**

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1     **I. INTRODUCTION AND QUALIFICATIONS**

2     **Q. Please state your name, title, and employer.**

3     A. My name is Courtney Lane. I am a Senior Associate at Synapse Energy Economics, Inc.  
4         (Synapse) located at 485 Massachusetts Avenue, Cambridge, MA 02139.

5     **Q. Please describe Synapse Energy Economics, Inc.**

6     A. Synapse is a research and consulting firm specializing in electricity and gas industry  
7         regulation, planning, and analysis. Our work covers a range of issues, including economic  
8         and technical assessments of demand-side and supply-side energy resources, energy  
9         efficiency policies and programs, integrated resource planning, electricity market  
10         modeling and assessment, renewable resource technologies and policies, and climate  
11         change strategies. Synapse works for a wide range of clients, including state attorneys  
12         general, offices of consumer advocates, trade associations, public utility commissions,  
13         environmental advocates, the U.S. Environmental Protection Agency (EPA), U.S.  
14         Department of Energy (DOE), U.S. Department of Justice, the Federal Trade  
15         Commission, and the National Association of Regulatory Utility Commissioners.  
16         Synapse has over 30 professional staff with extensive experience in the electricity  
17         industry.

18     **Q. Please summarize your professional and educational experience.**

19     A. I have over 15 years of experience in energy policy and regulation. At Synapse, I work on  
20         issues related to the assessment of cost-effectiveness tests for distributed energy  
21         resources and conduct rate and bill impacts assessments for energy efficiency programs  
22         on behalf of electric and natural gas utilities. I also was a contributor to the development

1 of the *National Standard Practice Manual for Benefit-Cost Analysis of Distributed*  
2 *Energy Resources*.<sup>1</sup> Prior to working at Synapse, I was employed by National Grid. At  
3 National Grid, I oversaw the benefit-cost models for the company's Rhode Island energy  
4 efficiency programs and was a core contributor to the development of the Rhode Island  
5 Benefit Cost Test (RI Test). During my employment at National Grid, I also served as the  
6 Growth Management Lead for New England, where I oversaw the development of  
7 customer products, services, and business models for Massachusetts and Rhode Island,  
8 which included electric vehicle programs. Prior to joining National Grid, I worked on  
9 regulatory and state policy issues pertaining to energy conservation, retail competition,  
10 net metering, and the Alternative Energy Portfolio Standard for Citizens for  
11 Pennsylvania's Future (PennFuture). Prior to that, I worked for Northeast Energy  
12 Efficiency Partnerships, Inc. where I promoted energy efficiency throughout the  
13 Northeast.

14 I hold a Master of Arts in Environmental Policy and Planning from Tufts University and  
15 a Bachelor of Arts in Environmental Geography from Colgate University. My resume is  
16 attached as Exhibit A.

17 **Q. On whose behalf are you testifying in this case?**

18 A. I am testifying on behalf of the Office of People's Counsel (OPC).

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<sup>1</sup> National Efficiency Screening Project (NSP), National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs), Aug. 2020. Available at: [https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs\\_08-04-2020\\_Final.pdf](https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-04-2020_Final.pdf).

1 **Q. What is the purpose of your testimony?**

2 A. The purpose of my testimony is to respond to the benefit-cost analysis (BCA) conducted  
3 by Mark Warner on behalf of Potomac Electric Power Company (“Pepco” or the  
4 “Company”) regarding its suite of electric vehicle (EV) program offerings.

5 **Q. Have you previously testified before the Public Service Commission of Maryland**  
6 **(Commission)?**

7 A. Yes. I previously testified on behalf of the OPC in Case No. 9645, Baltimore Gas and  
8 Electric Company’s Application for an Electric and Gas Multi-Year Plan.

9 **Q. Have you previously submitted testimony in proceedings before other state**  
10 **commissions or agencies?**

11 A. Yes. I have testified under oath and participated in regulatory proceedings before the  
12 Rhode Island Public Utilities Commission, the Pennsylvania Public Utility Commission,  
13 and the Public Service Commission of the District of Columbia. In Rhode Island, I  
14 testified on matters pertaining to energy efficiency, system reliability procurement, cost-  
15 effectiveness tests, and power sector transformation. In Pennsylvania, I testified on  
16 matters related to energy efficiency and retail electric markets. In the District of  
17 Columbia, I submitted written testimony on multi-year rate plans and performance  
18 incentive mechanisms.

19 **Q. What materials did you rely on to develop your testimony?**

20 A. The sources for my testimony are the Company’s Application and responses to discovery  
21 requests, public documents, and my personal knowledge and experience.

22 **Q. Was this testimony prepared by you or under your direction?**

23 A. Yes. My testimony was prepared by me or under my direct supervision and control.

1 **II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

2 **Q. Please summarize your primary conclusions regarding Pepco’s Witness Warner’s**  
3 **BCA.**

4 A. My primary conclusion is that Witness Warner uses a flawed methodology in assessing  
5 the cost-effectiveness of Pepco’s EV program offerings.

6 The Commission clearly requests a detailed cost-benefit assessment in Order No. 88997  
7 regarding the Petition for Implementation of a Statewide Electric Vehicle Portfolio,  
8 indicating it “expects the Utilities to include a detailed cost-benefit assessment - through  
9 a traditional test or a combination of tests - to substantiate, empirically, all cost  
10 expenditures related to EV charging for purposes of cost recovery in any future rate  
11 case.”<sup>2</sup>

12 However, Witness Warner’s benefit-cost assessment (BCA) does not provide a  
13 comprehensive view of all costs and benefits directly related to Pepco’s EV programs.  
14 Instead, his offer-specific merit tests provide a narrowly focused view by excluding key  
15 costs and benefits attributable to those programs. While Witness Warner does use the  
16 broader Societal Cost Test (SCT), he applies it to a market-wide case that includes costs  
17 and benefits not directly attributable to Pepco’s programs, instead of only accounting for  
18 societal costs and benefits created directly from these programs.

19 Witness Warner’s offer-specific merit tests also conflate cost-effectiveness with an  
20 assessment of ratepayer impacts by including the impact of changes to utility revenues

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<sup>2</sup> Case No. 9478, Order No. 88997 at 44, footnote 170.

1 and customer rates. These tests are not suitable for cost-effectiveness, nor do they provide  
2 any indication as to the extent by which rates will increase or decrease, the timing of the  
3 rate change, the allocation of changes in rates across customer classes, the number of  
4 participants in programs that will experience bill increases or decreases resulting from  
5 changes in rates, or any cross-subsidization between rate classes.

6 Further, while the Commission allows for the use of multiple cost-effectiveness tests,<sup>3</sup>  
7 Witness Warner's approach does not provide for a meaningful comparison. Instead of  
8 examining the same case (i.e., each program offering) using multiple tests, he applies  
9 different cost-effectiveness tests to different cases.

10 Finally, Witness Warner's BCA approach does not adhere to the principles of the  
11 *National Standard Practice Manual for Benefit-Cost Analysis* (NSPM) due to the fact it  
12 includes the impacts of changes to utility revenues, does not include all applicable costs-  
13 and benefits, and does not adequately align with Maryland's policy goals.

14 **Q. Please summarize your recommendations.**

15 A. My primary recommendation is that Witness Warner's BCA should not set precedent for  
16 future BCAs of EV programs conducted either prospectively or retrospectively.

17 In its Order in Case No. 9645, the Commission directed the PC44 Electric Vehicle Work  
18 Group (EV Work Group) to develop a consensus benefit-cost approach and methodology  
19 by December 1, 2021 for its consideration. The Commission further requested that as part

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<sup>3</sup> Case No. 9478, Order No. 88997, at 43.

1 of this effort, the EV Work Group should consider the issues raised in Case No. 9645 and  
2 examine the NSPM and the EmPOWER Maryland BCA framework for best practices in  
3 developing an EV BCA methodology.<sup>4</sup> Given the fact that this testimony raises many of  
4 the same issues identified in Case No. 9645, I recommend that Pepco resubmit a BCA for  
5 each program offering at the end of the five-year pilot in accordance with the outcome of  
6 this EV Work Group process.

7 I also recommend that the Commission:

- 8 1. Require Pepco to provide a justification of the costs related to Company-owned  
9 EV chargers as part of its consolidated reconciliation and final reconciliation as  
10 proposed in its Multi-Year Plan (MYP) filing. This should include a summary of  
11 revenues received from Company-owned chargers, how revenues were returned to  
12 customers, and the cost of the program.
- 13 2. Require Pepco to conduct a rate and bill impacts analysis for each customer rate  
14 class at the end of the five-year pilot period to assess the overall ratepayer impacts  
15 from its portfolio of EV offerings. This analysis should account for actual  
16 revenues received from Company-owned chargers, the impact of increased  
17 distribution revenues from EV charging due to the Company's programs, and how  
18 these revenues were allocated to each customer class.

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<sup>4</sup> Case No. 9645, Order No. 89678 at 113-114.

1     **III. SUMMARY OF WITNESS WARNER’S COST-EFFECTIVENESS ASSESSMENT**

2     **Q. Please summarize Witness Warner’s BCA approach.**

3     A. Witness Warner conducts BCAs for eight cases. These cases include a portfolio level  
4     BCA that examines the combined impact of the Company’s EV programs on Pepco’s  
5     ratepayers, two market-wide BCAs that examine the societal impacts of EV growth in  
6     Maryland, and five program-specific BCAs, which he refers to as “merit tests”, that  
7     examine the impact of each EV offering on Pepco’s ratepayers. The EV programs  
8     examined include: Offering 1: Residential Whole-House Time-of-Use (TOU) Rate;  
9     Offering 2: Residential Smart L2 Off-Peak; Offering 3: Residential TOU Pilot; Offering  
10    4: Commercial Multi-Unit-Dwelling (MUD); and Offering 5: Public Charging.

11    **Q. What cost-effectiveness tests are used for each case?**

12    A. Based on standard definitions of cost-effectiveness tests, it appears that Witness Warner  
13    uses the following:

- 14    • *Portfolio level BCA*: Ratepayer Impact Measure (RIM) test, plus the benefit of  
15    reduced emissions where applicable.
- 16    • *Market-Wide BCA (Natural and Managed)*: Societal Cost Test (SCT), plus the impact  
17    of changes in utility revenues.
- 18    • *Individual EV Program Offerings*:
  - 19    ○ *Offering 1: Residential Whole-House TOU Rate* - RIM test
  - 20    ○ *Offering 2: Residential Smart L2 Off-Peak* - RIM test

- 1           ○ *Offering 3: Residential TOU Pilot* - RIM test
- 2           ○ *Offering 4: Commercial MUD* - RIM test, plus benefit of reduced emissions.
- 3           ○ *Offering 5: Public Charging* - RIM test, plus benefit of reduced emissions.

4 **Q. What are the results of Witness Warner's BCA?**

5 A. Witness Warner provides results of his BCAs in Figure 1 of his direct testimony which I  
6 have recreated below.

7 **Table 1. Witness Warner BCA Summary**

	<b>B/C Ratio</b>	<b>Net Benefit (NPV)</b>
<b>Portfolio Level (Offerings 1-5)</b>	1.09	\$1,288,396
<b>Market-Wide SCT (Natural)</b>	1.98	\$1,285,634,754
<b>Market-Wide SCT (Managed)</b>	2.68	\$1,634,801,692
<b>Offering 1: Residential Whole-House TOU</b>	1.26	\$53,267
<b>Offering 2: Residential Smart L2 Off-Peak</b>	1.51	\$492,527
<b>Offering 3: Residential TOU Pilot</b>	0.33	-\$206,762
<b>Offering 4: Commercial MUD</b>	1.02	\$43,213
<b>Offering 5: Public Charging (DCFC &amp; L2)</b>	1.09	\$804,257

8 As Table 1 shows, the results of Witness Warner's BCAs show that each case is cost-  
9 effective with a benefit cost ratio (BCR) of over 1.0 except for Offering 3, which has a  
10 BCR of 0.33.

1     **IV. THE NATIONAL STANDARD PRACTICE MANUAL**

2     **Q. Please describe the National Standard Practice Manual and why it is applicable to**  
3     **your testimony.**

4     A. The National Energy Screening Project (NESP) is an organization working to improve  
5     cost-effectiveness screening practices for distributed energy resources (DERs).<sup>5</sup> To date,  
6     the NESP has issued two guidance manuals on cost-effectiveness screening: The National  
7     Standard Practice Manual for Evaluating the Cost-Effectiveness of Energy Efficiency  
8     Resources<sup>6</sup> (NSPM for EE) in 2017, and the recently published National Standard  
9     Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources<sup>7</sup> (NSPM for  
10    DERs) that incorporates and expands upon the guidance contained in the NSPM for EE.  
  
11    I use the NSPM for DERs as a guidepost for my testimony as it provides an “objective,  
12    policy- and technology-neutral, and economically sound guidance”<sup>8</sup> for developing a  
13    primary DER cost-effectiveness test (or modifying an existing primary test) and has been  
14    vetted by a cross-cutting advisory group consisting of regulators, state agencies, utilities,  
15    expert consultants, and representatives from the DER industry.

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<sup>5</sup> DERs are defined as energy efficiency (EE); demand response (DR); distributed generation (DG); distributed storage (DS); electric vehicles (EV); and increased electrification of buildings including heating and cooling systems.

<sup>6</sup> National Energy Screening Project (NESP), National Standard Practice Manual for Evaluating the Cost-Effectiveness of Energy Efficiency Resources (NSPM for EE), Edition 1 (2017), [https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM\\_May-2017\\_final.pdf](https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf).

<sup>7</sup> NSPM for DERs, *supra* note 1.

<sup>8</sup> *Id.* at i.

1 **Q. What are the fundamental cost-effectiveness principles of the NSPM for DERs?**

2 A. The NSPM for DERs provides a list of eight principles to assist in the review of an  
3 existing cost-effectiveness test and to guide the development of a new primary cost-  
4 effectiveness test from the ground up. The eight principles are summarized below:<sup>9</sup>

- 5 • *Principle 1 - Treat DERs as a Utility System Resource:* DERs should be  
6 compared with other energy resources, including other DERs, using consistent  
7 methods and assumptions to avoid bias across resource investment decisions.
- 8 • *Principle 2 - Align with Policy Goals:* Jurisdictions invest in or support energy  
9 resources to meet a variety of goals and objectives. The primary cost-  
10 effectiveness test should therefore reflect this intent by accounting for the  
11 jurisdiction's applicable policy goals and objectives.
- 12 • *Principle 3 - Ensure Symmetry:* Asymmetrical treatment of benefits and costs  
13 associated with a resource can lead to a biased assessment of the resource. To  
14 avoid such bias, benefits and costs should be treated symmetrically for any given  
15 type of impact.
- 16 • *Principle 4 - Account for Relevant, Material Impacts:* Cost-effectiveness tests  
17 should include all relevant (according to applicable policy goals) material  
18 impacts, including those that are difficult to quantify or monetize.

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<sup>9</sup> NSPM for DERs at 2-3.

- 1           • *Principle 5 - Conduct Forward-Looking, Long-term, Incremental Analyses:* Cost-  
2           effectiveness analyses should be forward-looking, long-term, and incremental to  
3           what would have occurred absent the DER. This helps ensure that the resource in  
4           question is properly compared with alternatives.
- 5           • *Principle 6 - Avoid Double-Counting Impacts:* Cost-effectiveness analyses  
6           present a risk of double-counting benefits and/or costs. All impacts should  
7           therefore be clearly defined and valued to avoid double-counting.
- 8           • *Principle 7 - Ensure Transparency:* BCA practices should be transparent, where  
9           all relevant assumptions, methodologies, and results are clearly documented and  
10          available for stakeholder review and input.
- 11          • *Principle 8 - Conduct BCAs Separately from Rate Impact Analyses:* Cost-  
12          effectiveness analyses answer fundamentally different questions than rate impact  
13          analyses. Cost-effectiveness analyses should therefore be conducted separately  
14          from rate impact analyses.

15 **Q. What type of cost-effectiveness test does the NSPM for DERs recommend?**

16 A. The NSPM for DERs recommends the development of a jurisdiction-specific cost-  
17 effectiveness test (JST).<sup>10</sup> Unlike traditional cost-effectiveness tests,<sup>11</sup> the JST should be  
18 based on the regulatory perspective. This perspective is typically broader than a Utility

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<sup>10</sup> NSPM for DERs at 3-3.

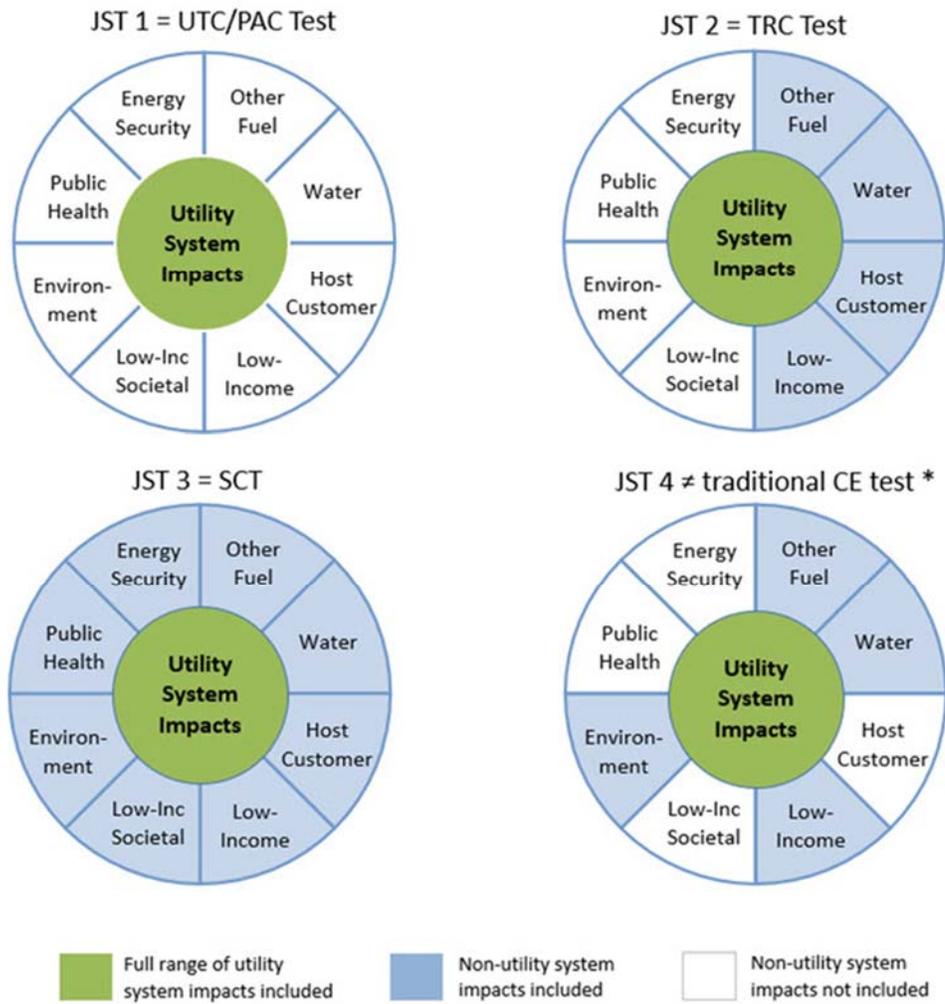
<sup>11</sup> Traditional cost-effectiveness tests include: Utility Cost Test (UCT) also referred to as the Program Administrator Cost (PAC) test, Participant Cost Test (PCT), Ratepayer Impact Measure (RIM) test, Total Resource Cost (TRC) test, and Societal Cost Test (SCT).

1 Cost Test (UCT) as it accounts for not only DER impacts to the utility system, but also  
2 accounts for applicable state policy goals and objectives.

3 A JST should account for all applicable utility system costs and benefits and include the  
4 appropriate non-utility system benefits and costs that create alignment with state policy  
5 goals. It is possible after accounting for all applicable impacts, the resulting JST aligns  
6 with a traditional cost-effectiveness test, though it is more likely to be unique to a specific  
7 jurisdiction. Figure 1 below provides an illustration of how additional costs and benefits  
8 can be added to utility system impacts, and how the choice of those impacts can be  
9 similar or different to traditional cost-effectiveness tests, such as the TRC test and the  
10 Societal Cost Test (SCT).

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Figure 1. NSPM for DERs Example Jurisdiction-Specific Test Relative to Traditional Tests<sup>12</sup>



\*JST 4 and other example JSTs 5, 6, 7 etc. could include a different set of non-utility system impacts depending on the applicable policies of those jurisdictions. JSTs may or may not include host customer (participant) impacts, and may or may not align with traditional tests.

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<sup>12</sup> NSPM for DERs at 3-15.

1     **V. THE BCA SHOULD INCLUDE ALL RELEVANT COSTS AND BENEFITS**

2     **BCA should align with NSPM Principles**

3     **Q. Does Witness Warner’s BCA approach and methodology adhere to the NSPM**  
4     **principles?**

5     A. No. Witness Warner’s BCA approach does not align with several of the NSPM principles  
6     as described below.

- 7             • *Principle 2 - Align with Policy Goals:*

8             This principle indicates that the primary cost-effectiveness test should account for  
9             a jurisdiction’s applicable policy goals and objectives. While Witness Warner  
10            accounts for changes in carbon dioxide (CO<sub>2</sub>) emissions in the Market-Wide SCT,  
11            Offering 4, and Offering 5 BCAs, he does not include emissions impacts that  
12            would result from peak load shifting resulting from Offerings 1, 2, and 3. CO<sub>2</sub>  
13            emissions impacts should be included across all BCAs where applicable as they  
14            are part of Maryland’s Greenhouse Gas Reduction Act (GGRA)<sup>13</sup> and the  
15            Maryland Department of the Environment (MDE) has identified the electrification  
16            of Maryland’s transportation sector as a key greenhouse gas (GHG) mitigation  
17            strategy to meet the GGRA reduction targets.<sup>14</sup>

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<sup>13</sup> 2016 Md. Laws, Ch. 011.

<sup>14</sup> Maillog #194882, PC43, Maryland Department of the Environment, Summary of Opening Remarks by Secretary Grumbles, at 1-2 (July 18, 2016)

1 Further, Witness Warner does not appear to account for the increased cost of  
2 compliance with Maryland's Renewable Energy Portfolio Standard (RPS) due to  
3 increased electricity usage resulting from Pepco's EV offerings.

4 • *Principle 4 - Account for Relevant, Material Impacts:*

5 This principle requires that cost-effectiveness tests include all relevant (according  
6 to applicable policy goals) material impacts, including those that are difficult to  
7 quantify or monetize. As mentioned above, impacts related to CO<sub>2</sub> emissions,  
8 RPS compliance, and participant costs and benefits are not accounted for  
9 consistently across the BCAs for Pepco's EV programs where applicable. This  
10 inconsistent approach is also not aligned with Principle 1, which states that  
11 consistent methods and assumptions should be used when conducting BCAs for a  
12 DER.

13 • *Principle 8 - Conduct BCAs Separately from Rate Impact Analyses:*

14 This principle indicates that cost-effectiveness analyses should be conducted  
15 separately from rate impact analyses. As described in more detail later in this  
16 testimony, Witness Warner uses a cost-effectiveness test that accounts for  
17 changes to utility revenues. Including changes to utility revenues in a BCA  
18 conflates rate impacts with cost-effectiveness, which does not provide for a  
19 meaningful understanding of either cost-effectiveness or rate impacts.

1 **Q. What do you recommend as the primary-cost effectiveness test for conducting a**  
2 **BCA for Pepco's EV offerings at the program and portfolio level?**

3 A. I recommend that Pepco's EV offerings be assessed using a JST as recommended by the  
4 NSPM for DERs. This test would include all utility system impacts, and account for  
5 applicable state policy goals as articulated in legislation, Commission Orders,  
6 regulations, guidelines, and other policy directives. For the purpose of this testimony, I  
7 will refer to this JST as the Maryland Cost-Effectiveness Test (MD Test).

8 **Q. What costs and benefits would be included in the MD Test?**

9 A. In accordance with Principle 1 of the NSPM, the MD Test should align with existing  
10 cost-effectiveness tests used for other DERs to the extent possible. Therefore, where  
11 applicable, the benefits and costs used to assess Maryland's EmPOWER energy  
12 efficiency programs should be included.

13 Maryland's EmPOWER energy efficiency programs utilize the TRC test as the primary  
14 cost-effectiveness test and the SCT as the other key test for evaluating programs.<sup>15</sup> This  
15 indicates that the MD Test should, at a minimum, account for the net present value of  
16 financial costs and benefits to the utility system and program participants.<sup>16</sup> Then, in  
17 accordance with Principle 2 of the NSPM, the MD test should account for environmental  
18 impacts related to changes in CO<sub>2</sub> emissions and impacts to RPS compliance costs. I

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<sup>15</sup> Navigant Consulting, Inc., EmPOWER Maryland Cost-Effectiveness Results for 2018 Energy Efficiency Programs in Maryland, ERRATA, Apr. 2020, at pg. 1. Available at: <https://webapp.psc.state.md.us/newIntranet/Maillog/content.cfm?filepath=//Coldfusion/Casenum/Admin%20Files/200000-249999/230127/EmPOWERCY2018Cost-EffectivenessReportERRATA-040820.pdf>

<sup>16</sup> Id.

1 provide a comprehensive list of the applicable costs and benefits in Table 2 in Section  
2 VIII later in my testimony.

3 **VI. COST-EFFECTIVENESS ANALYSES SHOULD BE SEPARATE FROM RATE**  
4 **IMPACT ANALYSES**

5 **Ratepayer Impact Measure Test should not be used for cost-effectiveness**

6 **Q. Please explain what cost-effectiveness test Witness Warner uses to assess Pepco's**  
7 **EV program offerings?**

8 A. Witness Warner appears to use a RIM test, plus environmental benefits where applicable,  
9 to assess each of Pepco's EV program offerings.

10 **Q. Please explain how you came to this conclusion.**

11 A. A RIM test is an indication of whether rates are likely to increase or decrease as a result  
12 of utility investments, and therefore primarily represents the perspective of non-  
13 participants (i.e., non-EV owners).<sup>17</sup> This is in line with Witness Warner's description of  
14 his portfolio level BCA, which "provides a narrow assessment of the net impacts on non-  
15 participating ratepayers (i.e., all utility customers that don't own a PEV) for the overall  
16 program."<sup>18</sup>

17 Further, a RIM test includes "the costs and benefits that will affect utility rates, including  
18 utility system costs and benefits plus lost revenues".<sup>19</sup> This is consistent with benefits and  
19 costs Witness Warner included for the portfolio level BCA and each offering-specific

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<sup>17</sup> NSPM for DERs at 3-2.

<sup>18</sup> Direct Testimony of Mark Warner at 39.

<sup>19</sup> NSPM for EE at 110.

1 BCA shown in Figure 4 on page 55 of Witness Warner’s direct testimony, specifically  
2 the inclusion of dilution of utility revenues and receipts from Company-owned EV  
3 charger usage.

4 However, I describe the cost-effectiveness test used for Program Offerings 4 and 5 as a  
5 modified RIM test since Witness Warner also includes environmental benefits that are  
6 directly induced by these programs.<sup>20</sup>

7 **Q. What is your concern with the use of the RIM test and the modified RIM test?**

8 A. I have several concerns with the use of the RIM test and modified RIM test for assessing  
9 the cost-effectiveness of Pepco’s EVs programs.

10 First, as the Commission states in Order No. 88997 regarding the Petition for  
11 Implementation of a Statewide Electric Vehicle Portfolio, it “expects the Utilities to  
12 include a detailed cost-benefit assessment—through a traditional test or a combination of  
13 tests—to substantiate, empirically, all cost expenditures related to EV charging for  
14 purposes of cost recovery in any future rate case.”<sup>21</sup>

15 While a RIM test is one of the traditional cost-effectiveness tests that is sometimes used  
16 to evaluate DERs, it conflates rate impacts with cost-effectiveness. The RIM test, by  
17 including impacts related to changes in utility revenues, does not provide a transparent  
18 view of cost-effectiveness for a new utility investment. Including changes in utility  
19 revenues results in a test that examines historical, sunk costs, on the distribution system

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<sup>20</sup> Direct Testimony of Mark Warner at 55.

<sup>21</sup> Case No. 9478, Order No. 88997 at 44, footnote 170.

1       rather than focusing on forward-looking and incremental impacts directly attributable to  
2       the utility investment. Pepco's past distribution system investments will need to be  
3       recovered regardless of Pepco's future investment in EV programs. While increased  
4       charging of EVs could lead to lower distribution rates due to increased sales, this  
5       represents a change in cost-recovery for historic investments (sunk costs) and provides  
6       little information as to the new direct impacts from Pepco's EV programs.

7       The NSPM for DERs does not recommend the use of the RIM test for cost-effectiveness  
8       stating, "[t]he RIM test can be useful for determining whether a DER will increase or  
9       decrease rates, but not in assessing cost-effectiveness."<sup>22</sup> Most jurisdictions have rejected  
10      the use of the RIM test for assessing cost-effectiveness of demand side measures. The  
11      most common primary measurement of energy efficiency cost-effectiveness is the TRC,  
12      followed by the SCT. In fact, the primary test used to assess the cost-effectiveness of  
13      Maryland's EmPOWER energy efficiency programs is the TRC. These tests do not  
14      account for lost revenues or any changes to revenues.

15      Further, the use of the RIM test, even with the inclusion of environmental benefits,  
16      excludes key benefits and costs of Pepco's EV programs. Most notably, Witness Warner  
17      does not include program participant costs and benefits. Participant costs typically  
18      include the customer's portion of the equipment and installation cost not covered by the

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<sup>22</sup> NSPM for DERs at A-4.

1 utility incentive. Participant benefits typically include non-energy impacts such as  
2 reduced fuel costs and operation and maintenance expenses.

3 **Changes to utility revenues and rates should not be included in cost-effectiveness**  
4 **tests**

5 **Q. Please explain how EVs impact customer rates and utility revenues.**

6 A. There are several ways EVs and utility EV programs can impact customer rates and  
7 utility revenues. When customers switch from a vehicle with an internal combustion  
8 engine to an EV, it increases electricity consumption, which in turn increases utility  
9 revenues. In general, if utility revenues increase from EV charging more than the costs to  
10 serve that load, it can lead to downward pressure on electric rates for all ratepayers  
11 regardless of whether they own an EV. Further, usage of utility owned EV chargers can  
12 lead to an increase in revenues.

13 On the other hand, certain EV program rate incentives, such as demand charge credits,  
14 can create lost revenues. This occurs when demand charges are not fully recovered by the  
15 utility to cover the cost of serving electricity and distribution capacity to its customers.

16 This effect is equivalent to the effect created by lost revenues from energy efficiency  
17 programs.

18 **Q. Does Witness Warner account for increased utility revenues from Pepco's EV**  
19 **programs in the BCA?**

20 A. Yes. Witness Warner accounts for changes in revenues as a "dilution of utility revenues"  
21 benefit in the BCA for Program Offerings 4 and 5. Specifically, Witness Warner  
22 estimates how unit-costs (dollars/kWh) of utility distribution revenue requirements  
23 change as the volume increases due to EV charging. He applies these dilution impacts on

1 a per-kWh basis to the non-PEV charging loads (i.e., electricity use by utility customers  
2 that do not own a PEV and who are not participating in the utility PEV Program) to  
3 determine utility customer impacts.<sup>23</sup> Witness Warner also includes revenues from utility-  
4 owned charging infrastructure as a benefit for Program Offering 5.<sup>24</sup>

5 **Q. Does Witness Warner account for lost revenues from Pepco's EV programs in the**  
6 **BCA?**

7 A. Yes. As part of Offering 4: Commercial MUD, Pepco offers a 30-month demand charge  
8 credit to MUD, workplace, and fleet customers for 50 percent of the nameplate capacity  
9 of installed EV charging infrastructure.<sup>25</sup> Witness Warner includes the value of the  
10 demand charge offset incentive as a cost within the Offering 4 merit test.<sup>26</sup> While he  
11 defines this incentive as a cost for his purposes, it is technically lost revenues.

12 **Q. Is it appropriate to account for changes in utility revenues and rates (increases or**  
13 **decreases) in a cost-effectiveness test?**

14 A. No. According to the NSPM for DERs, cost-effectiveness analyses should be conducted  
15 separately from rate impact analyses. This is because cost-effectiveness tests and rate  
16 impact analyses serve different purposes.

17 A cost-effectiveness test seeks to determine whether the benefits of a utility investment  
18 exceed the costs, and therefore warrants investment on behalf of customers. It should be  
19 forward-looking and examine new and incremental impacts directly related to utility

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<sup>23</sup> Direct Testimony of Mark Warner at 20.

<sup>24</sup> Direct Testimony of Mark Warner at 30.

<sup>25</sup> Case No. 9478, Post-Order Compliance Filing of Baltimore Gas and Electric Company, Delmarva Power & Light Company, and Potomac Electric Power Company Regarding the Implementation of Approved Electric Vehicle Charging Program Offerings, at 20.

<sup>26</sup> Direct Testimony of Mark Warner at 53.

1 investment. It does not examine how benefits and costs are distributed across different  
2 customers; it only seeks to assess impacts to all customers on average.

3 On the other hand, a rate impact analysis examines whether a utility investment or  
4 program will increase or decrease customer rates, and if so, by how much. A rate impact  
5 analysis will take into account how rate impacts are distributed across customers and can  
6 provide important insight into issues of cost-shifting and equity across program  
7 participants, non-participants, and customers on average. The results of a rate impacts  
8 analysis will provide a long-term change in rates (\$/kWh) or percent changes in rates by  
9 customer rate class.

10 The Commission appears to note this distinction in Order No. 88997, where it states it  
11 must consider “the appropriate size of an EV charging program, the level of utility  
12 involvement, the ratepayer impacts, the cost-effectiveness of the program, the overall  
13 benefits to all Maryland ratepayers, and the potential impediments to competition by  
14 market participants.”<sup>27</sup> In this case, the EV program’s impact on ratepayers and its cost-  
15 effectiveness are distinct criteria of review.

16 **Q. On page 8 of his Direct Testimony, Witness Warner indicates his offer-specific merit**  
17 **tests will provide the Commission with a preview of how the Company’s EV**  
18 **programs will impact ratepayers, do you agree?**

19 A. No. While it is true that the RIM test can be used to determine whether an EV program is  
20 likely to increase or decrease rates, there are flaws in Witness Warner’s methodology. If

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<sup>27</sup> Case No. 9478, Order No. 88997 at 37.

1           Witness Warner seeks to use the RIM test for the sole purpose of identifying the  
2           likelihood of rate changes, he should not include environmental impacts.

3           While these benefits are a result of EV programs, they are not currently monetized in  
4           customer rates. Customers will not see a change in rates due to these environmental  
5           benefits. This is an important distinction as excluding these benefits changes Witness  
6           Warner's BCA results. For example, if the environmental benefits are removed from  
7           Pepeco Offering 4: Commercial MUD, the resulting BCR is lowered from 1.02 down to  
8           0.37, indicating that ratepayers are worse off from this program. Similarly, the BCR for  
9           Offering 5: Public Charging is reduced from 1.09 to 0.61 and the BCR for the EV  
10          portfolio as a whole is reduced from 1.09 to 0.64.

11       **Q.    Should the Commission examine how changes in utility revenues from EVs impact**  
12       **customer rates?**

13       A.    Yes. The impacts that EV charging can have on utility revenues and costs can create real  
14       impacts on customer rates and bills.<sup>28</sup> While it is not appropriate to include these impacts  
15       in cost-effectiveness tests, they should still be examined.

16           The optimal way to account for these impacts is to conduct a separate long-term rate  
17       impact analysis, that also includes a bill impacts and participation analysis.

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<sup>28</sup> For example, a recent study focused on California found that the increased utility revenues more than they have increased utility costs, leading to downward pressure on electric rates for EV-owners and non-EV owners alike. (Source: Synapse Energy Economics, Electric Vehicles Are Driving Electric Rates Down (2019), <https://www.synapse-energy.com/sites/default/files/EVs-Driving-Rates-Down-8-122.pdf>.)

- 1           • Rate impacts indicate the extent to which rates change for all customers due to  
2           a utility EV program. This includes upward pressure on rates from program  
3           costs and recovery of lost revenues, as well as downward pressure on rates  
4           from increased revenues and avoided utility system costs. The rate impact  
5           analyses should include only those impacts that will affect rates, which means  
6           all utility system costs and benefits and the effect of increased or decreased  
7           revenues.
- 8           • Bill impacts indicate the extent to which customer bills might change for those  
9           customers that participate in an EV program and how bills will be impacted  
10          for non-participating customers.
- 11          • Participation impacts indicate the portion of customers that will experience  
12          bill changes due to participation in an EV program.

13          When considered together, these analyses can provide valuable insights into how utility  
14          programs impact ratepayers and the distribution of those impacts. Such studies have been  
15          conducted for EE programs in Vermont<sup>29</sup> and Rhode Island.<sup>30</sup>

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<sup>29</sup> Tim Woolf, et al., Rate and Bill Impacts of Vermont Energy Efficiency Programs from Proposed Long-Term Energy Efficiency Scenarios 2014-2034 (2014), <https://www.synapse-energy.com/sites/default/files/SynapseReport.2014-04.VT-PSD.VT-EE-Bill-Impacts.13-088.pdf>

<sup>30</sup> The Rhode Island analysis is included in Attachment 7 of The Narragansett Electric Co. d/b/a National Grid - 2020 Energy Efficiency Plan (Docket No. 4979). Available at: [http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-EEPP2020%20\(10-15-19\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-EEPP2020%20(10-15-19).pdf)

1     **VII. USE OF MULTIPLE COST EFFECTIVENESS TESTS**

2     **Q.     Do you find that Witness Warner’s use of multiple tests provides for a**  
3     **comprehensive view of Pepco’s EV programs?**

4     A.     No, I do not. Witness Warner states that the “market-wide assessment, and the collective  
5     of offer-specific tests, are provided to offer the Commission two perspectives on the  
6     merit of the Company’s EV offerings.”<sup>31</sup> However, neither of these perspectives provide  
7     the Commission with adequate information on the cost-effectiveness of Pepco’s EV  
8     programs.

9     The Market-Wide SCT, both for the “natural” and “managed” case, does not provide the  
10    Commission with the information needed to assess whether Pepco’s EV programs are  
11    cost-effective. This is because the Market-Wide SCT includes costs and benefits that are  
12    not directly related to Pepco’s EV programs. As stated by Witness Warner, this approach  
13    “is helpful for understanding the overall policy merit of vehicle electrification, but  
14    implicitly overstates benefits associated with a particular Pepco offering since it  
15    considers the impact of all PEVs, beyond the market-impact scope of a particular utility  
16    proposal.”<sup>32</sup>

17    The question before the Commission is not whether the overall policy of vehicle  
18    electrification is beneficial, it is whether Pepco’s investment in EV programs is  
19    beneficial. If Pepco seeks to justify cost-recovery for its EV programs, it should include  
20    only benefits and costs that are directly attributable to those programs.

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<sup>31</sup> Direct Testimony of Mark Warner at 4-5.

<sup>32</sup> Direct Testimony of Mark Warner at 38.

1           Regarding the offer-specific merit tests, while these include only the benefits and costs  
2           directly attributable to Pepco's programs, they are overly narrow and do not provide a  
3           holistic view of cost-effectiveness. Further these tests conflate rate impacts with cost-  
4           effectiveness by including changes to utility revenues and customer rates. These offer-  
5           specific merit tests therefore do not provide meaningful information for either customer  
6           rate impacts or overall cost-effectiveness.

7   **Q.   Do you find any additional flaws with Witness Warner's use of multiple cost-**  
8   **effectiveness tests?**

9   A.   Yes. Witness Warner does not examine the same case (i.e., market-wide case or offer-  
10   specific case) using various cost-effectiveness tests. Instead, he applies a different cost-  
11   effectiveness test, with differing types of benefits and costs, to different cases.  
12   Specifically, Witness Warner applies the SCT to the market-wide case and then applies a  
13   ratepayer focused test to each offer-specific case. This does little to enhance the  
14   understanding of Pepco's EV program impacts because it does not allow for a  
15   comparison across the different offerings or the different tests.

16 **Q.   What is your recommendation for the use of multiple cost-effectiveness tests?**

17 A.   Considering the Commission's comment in Order 88997 that "a combination of tests may  
18   yield more successful results than any single approach"<sup>33</sup>, I recommend that the MD Test  
19   described above be used as the primary cost-effectiveness test to assess Pepco's EV  
20   offerings at the program and portfolio level. Then if further tests are warranted to  
21   enhance the overall understanding of EV program impacts, then secondary tests can be

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<sup>33</sup> Case No. 9478, Order No. 88997 at 43.

1 developed to investigate specific questions. Either way, it is important that each one of  
2 Pepco's EV programs be subject to the same primary test and the same secondary test (or  
3 tests), to provide meaningful and consistent assessments across all programs.

4 This would align with the way multiple cost-effectiveness tests are applied in the  
5 EmPOWER MD Programs, where programs are assessed using the TRC test as the  
6 primary test, but results were also shown using the UCT, PCT, RIM, and SCT.<sup>34</sup>

7 **VIII. RECOMMENDED MODIFICATIONS TO WITNESS WARNER'S BCA**

8 **Q. Based on your review of Witness Warner's BCA, please summarize your key**  
9 **findings.**

10 A. Based on my review of Witness Warner's approach, I have identified several deficiencies  
11 in each of his BCAs.

12 **Market-Wide SCT ("Natural" and "Managed")**

13 **Q. Please describe the deficiencies found in the Market-Wide SCT.**

14 A. A key deficiency with the Market-Wide SCT, both for the "natural" and "managed" case,  
15 is that it includes costs and benefits that are not directly related to Pepco's EV programs.  
16 If Pepco seeks to justify cost-recovery for its EV programs, it should only include  
17 benefits and costs that are directly attributable to those programs.

18 While a market-wide BCA can be beneficial in determining whether a jurisdiction should  
19 implement policies and initiatives that support investment in EVs by assessing if the state

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<sup>34</sup> Potomac Electric Power Company 2018-2020 EmPOWER MD Program Filing (Case No. 9155).

1 would be better off with or without them, such a test should not be used to justify cost-  
2 recovery of a specific existing utility program.

3 Further, it is not appropriate to include changes in utility revenues as part of an SCT, and  
4 for the reasons provided earlier in this testimony this benefit should not be included in  
5 any BCA.

6 **Q. What are your recommended modifications to Witness Warner's Market-Wide**  
7 **SCT?**

8 A. My first recommendation is that only the costs and benefits directly attributable to  
9 Pepco's EV programs be included in the SCT. My second recommendation is that  
10 changes in utility revenues, what Witness Warner refers to as dilution benefits, not be  
11 included.

12 **Offering-Specific BCAs**

13 **Q. Please describe the deficiencies found in the BCA for Offering 1, the Residential**  
14 **"Whole House" TOU Rate.**

15 A. I find one deficiency in the BCA for Offering 1.

16 1. Full impacts of peak load shifting should be included. Witness Warner includes  
17 benefits related to moving residential vehicle charging load from on-peak to off-peak  
18 period but does not account for the associated changes in electric sector emissions. Load  
19 shifting from on-peak to off-peak periods can result in a change of polluting emissions  
20 from the power sector that can also create health impacts. The exact impact will depend  
21 on the relative emissions rates of the power plants that are on the margin at the time of

1 off-peak charging versus the time of on-peak charging. These impacts should be  
2 included.

3 **Q. Please describe the deficiencies found in the BCA for Offering 2, the Residential**  
4 **Smart Charging Program?**

5 A. I find two key deficiencies in the BCA for Offering 2.

6 1. Participant impacts should be included. For reasons discussed earlier in my testimony,  
7 participant (also referred to as host customer) impacts should be included. Participants in  
8 this program will experience a cost. Pepco's incentives would not cover the full cost of  
9 the charging equipment or the cost of installation.<sup>35</sup> Therefore, the participant's share of  
10 the EV charger equipment and installation costs net of the utility incentive should be  
11 included as a cost in this BCA. Further, if there are material participant non-energy  
12 impacts from this program, those should also be included. At a minimum, these impacts  
13 should be discussed qualitatively.

14 2. Full impacts of peak load shifting should be included. Similar to Offering 1, Witness  
15 Warner includes benefits related to moving residential vehicle charging load from on-  
16 peak to off-peak periods but does not account for the associated changes in electric sector  
17 emissions. These impacts should be included as described above for Offering 1.

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<sup>35</sup> Case No. 9478, Post-Order Compliance Filing of Baltimore Gas and Electric Company, Delmarva Power & Light Company, and Potomac Electric Power Company Regarding the Implementation of Approved Electric Vehicle Charging Program Offerings, at 11.

1 **Q. Please describe the deficiencies found in the BCA for Offering 3, the Residential**  
2 **TOU Pilot?**

3 A. I find two key deficiencies in the BCA for Offering 3.

4 1. Participant impacts should be included. Similar to Offering 2, participant impacts  
5 should be included. Participants in this program will experience a cost. Pepco's rebate  
6 would only cover "50% of the purchase and installation of a charger".<sup>36</sup> Therefore, the  
7 participant's share of the EV charger equipment and installation costs net of Pepco's  
8 rebate should be included as a cost in this BCA. Further, if there are material participant  
9 non-energy impacts from this program, those should also be included. At a minimum,  
10 these impacts should be discussed qualitatively.

11 2. Full impacts of peak load shifting should be included. Similar to Offering 1 and 2,  
12 Witness Warner includes benefits related to moving residential vehicle charging load  
13 from on-peak to off-peak periods but does not account for the associated changes in  
14 electric sector emissions. These impacts should be included as described above for  
15 Offering 1.

16 **Q. Please describe the deficiencies found in the BCA for Offering 4, Commercial**  
17 **MUD?**

18 A. I find six key deficiencies in the BCA for Offering 4.

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<sup>36</sup> Direct Testimony of Mark Warner at 51.

1       1. Participant impacts should be included. Similar to Offering 2 and 3, participant costs  
2       and benefits should be included in this BCA. Pepco will provide incentives for 50 percent  
3       of the total EV charger cost and 100 percent of the installation costs up to \$7,500 per site  
4       as part of this program offering.<sup>37</sup> The participant share of the EV charger equipment and  
5       installation costs after accounting for the utility incentive should be included as a cost in  
6       this BCA. Further, since this program is designed to incentivize new EV drivers, the costs  
7       and benefits of those new EVs should be accounted for. This would include the  
8       incremental cost of the new EV compared to an internal combustion engine vehicle, as  
9       well as the benefits of net fuel savings, and operation and maintenance (O&M) savings.

10      2. Dilution benefits (revenue impacts) should not be included. For reasons discussed  
11      previously in my testimony, revenue impacts, what Witness Warner describes as dilution  
12      benefits, should not be included in this BCA.

13      3. The benefit of Wholesale Loadshaping should not be included. Witness Warner  
14      includes a benefit called “wholesale loadshaping” in his BCA for Offering 4. The  
15      rationale for this benefit is that average wholesale unit costs are reduced due to more  
16      optimal loading when larger fractions of total wholesale costs occur in lower off-peak  
17      times.<sup>38</sup> However, it is not clear that Offering 4 contains a component to encourage off-  
18      peak charging. Consequently, one cannot assume that this offering will produce such a  
19      benefit. Therefore, it should not be included in this BCA.

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<sup>37</sup> Direct Testimony of Mark Warner at 52.

<sup>38</sup> Direct Testimony of Mark Warner at 20.

1 4. Generation costs should be included. While Witness Warner includes the impacts of  
2 increased capacity and transmission costs, he does not appear to include increased  
3 generation costs. The EV chargers incentivized by this program will increase electricity  
4 usage and electricity generation. This increased cost should be included in the BCA.

5 5. RPS compliance costs should be included. The increase in electricity load due to new  
6 EV chargers incentivized by this program will increase the quantity of renewable energy  
7 or RECs needed to meet Maryland's RPS. This increased costs should be included in this  
8 BCA.

9 6. Demand charge credit costs should not be included. The rate incentive (demand charge  
10 offset) should not be included as a program cost. As mentioned earlier in this testimony,  
11 demand charge offsets or credits create lost revenues and should not be included in a  
12 BCA.

13 **Q. Please describe the deficiencies found in the BCA for Offering 5, the Utility-Owned**  
14 **Public Charging Program?**

15 A. I find four key deficiencies in the BCA for Offering 5.

16 1. Participant impacts should be included. If a goal of this offering is to increase new EVs  
17 on the road, then the cost and benefits of those vehicles should be included. Witness  
18 Warner accounts for the environmental benefits of enabled EVs in this BCA but is not  
19 accounting for their costs. These enabled EVs are participants in this program. If benefits  
20 are included for these enabled vehicles, costs should also be included to ensure  
21 symmetry. This would include the incremental cost of the new EV purchase and  
22 additional benefits like net fuel cost savings and O&M savings.

1           2. Receipts (revenues) from Pepco-owned EV chargers should not be included as a  
2           benefit. For reasons discussed previously in my testimony, revenues from utility-owned  
3           chargers (what Witness Warner calls “receipts”) should not be counted as a benefit. This  
4           impact is more appropriate for inclusion in a rate and bill impacts assessment that should  
5           be conducted separate from a cost-effectiveness test according to the Principle 8 of the  
6           NSPM for DERs.

7           3. Dilution benefits (revenue impacts) should not be included. For reasons discussed  
8           previously in my testimony, dilution benefits should not be included in this BCA.

9           4. RPS compliance costs should be included. While Witness Warner does appear to  
10          include increased generation costs from this program (listed as Utility OpEx in the BCA),  
11          he does not account for the increase in RPS requirements from this increase in electricity  
12          usage. The increase in electricity load due to new EV chargers incentivized by this  
13          program will increase the quantity of renewable energy or RECs needed to meet  
14          Maryland’s RPS. This increased cost should be included in this BCA.

15   **Q.   Based on these findings, what benefits and costs do you recommend for inclusion in**  
16   **the BCA for program-specific offerings?**

17   A.   In Table 2 below, I revise Witness Warner’s Figure 4, originally found on page 55 of his  
18          Direct Testimony, to reflect the benefits and costs that should be included in the MD Test  
19          for review of Pepco’s EV program offerings.

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**Table 2. Applicable benefits and costs for MD Test**

<b>Merit Test</b>	<b>Impact</b>	<b>Cost or Benefit</b>
<b>Offering 1: Residential Whole-house TOU rate</b>		
Avoided peaking costs (as originally included by Witness Warner: includes Reduced Capacity Costs and Transmission Costs)	Utility System	Benefit
Emissions Impact from Load Shifting (CO <sub>2</sub> , NO <sub>x</sub> )	Societal	Likely a Benefit
Public Health Impacts from Load Shifting	Societal	Likely a Benefit
Program Administration Costs (programs share of marketing, evaluation, and labor costs)	Utility System	Cost
<b>Offering 2: Residential Smart Charging</b>		
Avoided peaking costs (as originally included by Witness Warner: includes Reduced Capacity Costs and Transmission)	Utility System	Benefit
Emissions Impact from Load Shifting (CO <sub>2</sub> , NO <sub>x</sub> )	Societal	Likely a Benefit
Public Health Impacts from Load Shifting	Societal	Likely a Benefit
Program Administration Costs (programs share of marketing, evaluation, and labor costs)	Utility System	Cost
Program Incentive costs (equipment/installation rebate/off-peak bill credit payment)	Utility System	Cost
Participant (host customer) costs (participant share of equipment/installation costs)	Participant	Cost
Participant (host customer) non-energy impacts	Participant	Benefit or Cost
<b>Offering 3: Residential TOU Pilot</b>		
Avoided peaking costs (Reduced Capacity Costs and Transmission Costs)	Utility System	Benefit
Emissions Impact from Load Shifting (CO <sub>2</sub> , NO <sub>x</sub> )	Societal	Likely a Benefit
Public Health Impacts from Load Shifting	Societal	Likely a Benefit
Program Administration Costs (programs share of marketing, evaluation, and labor costs)	Utility System	Cost
Program Incentive Costs (equipment/installation rebate, network)	Utility System	Cost
Participant (host customer) costs (participant share of equipment/installation costs)	Participant	Cost
Participant (host customer) non-energy impacts	Participant	Benefit or Cost
<b>Offering 4: Commercial MUD</b>		
Costs of increased load at peak time (as originally included by Witness Warner: includes Capacity Costs and Transmission Costs)	Utility System	Cost
Energy Generation	Utility System	Cost
RPS Compliance Costs	Utility System	Cost
Emissions reductions (CO <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> ) should be net accounting for decrease in gasoline usage and increase in electricity usage	Society	Benefit
Program Administration Costs	Utility System	Cost
Program Incentive Costs (equipment/installation rebate)	Utility System	Cost

Participant (host customer) cost (participant share of equipment/installation costs/incremental cost of new EV)	Participant	Cost
Participant (host customer) non-energy impacts (EV net fuel savings, O&M savings)	Participant	Benefit or Cost
<b>Offering 5: Utility Owned Chargers for Public Use</b>		
Costs of increased load at peak time (as originally included by Witness Warner: includes Capacity Costs and Transmission Costs)	Utility System	Cost
Wholesale Market Price Effect	Utility System	Cost
Energy Generation	Utility System	Cost
RPS Compliance Costs	Utility System	Cost
Emissions reductions (CO <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> ) should be net accounting for decrease in gasoline usage and increase in electricity usage	Society	Benefit
Program Administration Costs (equipment/installation/management/Operation)	Utility System	Cost
Participant (host customer) cost (incremental cost of enabled EVs)	Participant	Cost
Participant (host customer) non-energy impacts (EV net fuel savings, O&M savings)	Participant	Benefit or Cost

1 **Q. How would Witness Warner’s BCA results change due to the adoption of these**  
 2 **recommended changes?**

3 A. I do not have sufficient information to create revised BCAs for each program offering  
 4 using benefits and costs included in Table 2, so it is unclear if the resulting BCRs would  
 5 be cost-effective.

6 **Q. What is your recommendation given the uncertainty of the resulting BCRs from**  
 7 **your recommendations?**

8 A. Given the fact that this is a pilot program and that it has already been approved by the  
 9 Commission, it is reasonable that Pepco is allowed cost-recovery for these offerings  
 10 within this MYP. However, I recommend that the Commission require Pepco to complete  
 11 the following:

- 12 1. Provide a justification of program costs as part of its consolidated reconciliation  
 13 and final reconciliation, as proposed in its MYP filing. This should include a

1 summary of revenues received from Company-owned chargers, how revenues  
2 were returned to customers, and the cost of the program.

3 2. Conduct a BCA at the end of the five-year pilot period that adheres to the  
4 outcome of the EV Work Group.

5 3. Conduct a rate and bill impacts analysis. This is particularly important given the  
6 uncertainty surrounding revenues from Company-owned chargers in Offering 5.  
7 For instance, Pepco reported losses for all but one of their Company-owned  
8 public charging sites as part of its Semi-Annual Progress Report to the  
9 Commission. For each site, except for the Rockville location, the charging station  
10 revenue was less than the charging station bill.<sup>39</sup> This contrasts with the revenues  
11 Pepco claims in its MYP and Witness Warner includes in his BCA. It will be  
12 important to assess how the actual revenues and ratepayer impacts compare to  
13 these projections at the conclusion of the pilot.

14 **Q. Does this conclude your testimony?**

15 **A.** Yes, it does.

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<sup>39</sup> Case No. 9478, Q3/Q4 Semi-Annual Progress Report of Baltimore Gas and Electric Company, Delmarva Power & Light Company, and Potomac Electric Power Company Regarding the Implementation of Approved Electric Vehicle Charging Program Offerings, February 1, 2021, at Appendix Q.



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### PROFESSIONAL EXPERIENCE

**Synapse Energy Economics, Inc.**, Cambridge, MA. *Senior Associate*, November 2019 – Present.

Provides consulting and researching services on a wide range of issues related to the electric industry including performance-based regulation, benefit-cost assessment, rate and bill impacts, and wholesale electric retail markets. Develops expert witness testimony in public utility commission proceedings.

**National Grid**, Waltham, MA. *Growth Management Lead, New England*, May 2019 – November 2019, *Lead Analyst for Rhode Island Policy and Evaluation*, June 2013 – April 2019.

- Portfolio management of product verticals including energy efficiency, demand response, solar, storage, distributed gas resources, and electric transportation, to optimize growth and customer offerings.
- Strategy lead for the Performance Incentive Mechanisms (PIMs) working group.
- Worked with internal and external stakeholders and led the development of National Grid's Annual and Three-Year Energy Efficiency Plans and System Reliability Procurement Plans for the state of Rhode Island.
- Represented energy efficiency and demand response within the company at various Rhode Island grid modernization proceedings.
- Led the Rhode Island Energy Efficiency Collaborative; a group focused on reaching consensus regarding energy efficiency plans and policy issues for demand-side resources in Rhode Island.
- Managed evaluations of National Grid's residential energy efficiency programs in Rhode Island, and benefit-cost models to screen energy efficiency measures.

**Citizens for Pennsylvania's Future**, Philadelphia, PA. *Senior Energy Policy Analyst*, 2005–2013.

- Played a vital role in several legislative victories in Pennsylvania, including passage of energy conservation legislation that requires utilities to reduce overall and peak demand for electricity (2009); passage of the \$650 million Alternative Energy Investment Act (2008); and important amendments to the Alternative Energy Portfolio Standards law vital to the development of solar energy in Pennsylvania (2007).
- Performed market research and industry investigation on emerging energy resources including wind, solar, energy efficiency and demand response.
- Planned, facilitated and participated in wind energy advocates training meetings, annual partners retreat with members of wind and solar companies, and the PennFuture annual clean energy conference.

**Northeast Energy Efficiency Partnerships, Inc.**, Lexington, MA. *Research and Policy Analyst*, 2004–2005.

- Drafted comments and testimony on various state regulatory and legislative actions pertaining to energy efficiency.
- Tracked energy efficiency initiatives set forth in various state climate change action plans, and federal and state energy regulatory developments and requirements.
- Participated in Regional Greenhouse Gas Initiative (RGGI) stakeholder meetings.
- Analyzed cost-effectiveness of various initiatives within the organization.

**Massachusetts Executive Office of Environmental Affairs**, Boston, MA. *Field Projects Extern*, 2003.

- Worked for the Director of Water and Watersheds at the EOEA, examining the risks and benefits of different groundwater recharge techniques and policies throughout the U.S.
- Presented a final report to both Sea Change and the EOEA with findings and policy recommendations for the state.

**EnviroBusiness, Inc.**, Cambridge, MA. *Environmental Scientist*, July 2000 – May 2001

- Conducted pre-acquisition assessments/due diligence assignments for properties throughout New England. Environmental assessments included an analysis of historic properties, wetlands, endangered species habitat, floodplains, and other areas of environmental concern and the possible impacts of cellular installations on these sensitive areas.
- Prepared and managed NEPA reviews and Environmental Assessments for telecommunications sites.

## SKILLS

Software: SPSS, Arcview GIS, Access, Dreamweaver, Front Page, Microsoft Excel, Word, Power Point

## EDUCATION

**Tufts University**, Medford, MA

Master of Arts; Environmental Policy and Planning, 2004.

**Colgate University**, Hamilton, NY

Bachelor of Arts; Environmental Geography, 2000, *cum laude*.

## PUBLICATIONS

Lane, C., K. Takahashi. 2020. *Rate and Bill Impact Analysis of Rhode Island Natural Gas Energy Efficiency Programs*. Synapse Energy Economics for National Grid.

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Chang, M., J. Frost, C. Lane, S. Letendre, PhD. 2020. *The Fixed Resource Requirement Alternative to PJM's Capacity Market: A Guide for State Decision-Making*. Synapse Energy Economics for the State Energy & Environmental Impact Center at the NYU School of Law.

National Energy Screening Project. 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance.

## TESTIMONY

**Maryland Public Service Commission (Case No. 9645):** Direct and Surrebuttal Testimony of Courtney Lane regarding the Application of Baltimore Gas and Electric Company for an Electric and Gas Multi-Year Plan. On behalf of the Maryland Office of People's Counsel. August 14, 2020 and October 7, 2020.

**Maryland Public Service Commission (Case No. 9619):** Comments of Maryland Office of People's Counsel Regarding Energy Storage Pilot Program Applications, attached Synapse Energy Economics Report. June 23, 2020.

**Public Service Commission of the District of Columbia (Formal Case No. 1156):** Direct, Rebuttal, Surrebuttal, and Supplemental Testimony of Courtney Lane regarding the Application of Potomac Electric Power Company for Authority to Implement a Multiyear Rate Plan for Electric Distribution Service in the District of Columbia. On behalf of the District of Columbia Government. March 6, 2020, April 8, 2020, June 1, 2020, and July 27, 2020.

**Rhode Island Public Utilities Commission (Docket No. 4888):** Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2019 Energy Efficiency Program (EEP). On behalf of National Grid. December 11, 2018.

**Rhode Island Public Utilities Commission (Docket No. 4889):** Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2019 System Reliability Procurement Report (SRP). On behalf of National Grid. December 10, 2018.

**Rhode Island Public Utilities Commission (Docket No. 4755):** Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2018 Energy Efficiency Program (EEP). On behalf of National Grid. December 13, 2017.

**Rhode Island Public Utilities Commission (Docket No. 4684):** Oral testimony of Courtney Lane regarding the RI Energy Efficiency and Resource Management Council (EERMC) Proposed Energy Efficiency Savings Targets for National Grid's Energy Efficiency and System Reliability Procurement for the Period 2018-2020 Pursuant to §39-1-27.7. On behalf of National Grid. March 7, 2017.

**Rhode Island Public Utilities Commission (Docket No. 4684):** Oral testimony of Courtney Lane regarding National Grid's 2018-2020 Energy Efficiency and System Reliability Procurement Plan. On behalf of National Grid. October 25, 2017.

**Rhode Island Public Utilities Commission (Docket No. 4654):** Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2017 Energy Efficiency Program Plan (EEPP) for Electric & Gas. On behalf of National Grid. December 8, 2016.

**Rhode Island Public Utilities Commission (Docket No. 4580):** Oral testimony of Courtney Lane regarding the Narragansett Electric Co. d/b/a National Grid - 2016 Energy Efficiency Program Plan (EEPP) for Electric & Gas. On behalf of National Grid. December 2, 2015.

**Pennsylvania Public Utility Commission (Docket No. P-2012-2320369):** Direct testimony of Courtney Lane regarding the Petition of PPL Electric Utilities Corporation for an Evidentiary Hearing on the Energy Efficiency Benchmarks Established for the Period June 1, 2013 through May 31, 2016. On behalf of PennFuture. October 19, 2012.

**Pennsylvania Public Utility Commission (Docket No. P-2012-2320334):** Direct testimony of Courtney Lane regarding the Petition of PECO Energy for an Evidentiary Hearing on the Energy Efficiency Benchmarks Established for the Period June 1, 2013 through May 31, 2016. On behalf of PennFuture. September 20, 2012.

**Pennsylvania Public Utility Commission (Docket No. I-2011-2237952):** Oral testimony of Courtney Lane regarding the Commission's Investigation of Pennsylvania's Retail Electricity Markets. On behalf of PennFuture. March 21, 2012.

**Committee on the Environment Council of the City of Philadelphia (Bill No. 110829):** Oral testimony of Courtney Lane regarding building permitting fees for solar energy projects. On behalf of PennFuture. December 5, 2011.

**Pennsylvania Public Utility Commission (Docket No. M-00061984):** Oral testimony of Courtney Lane regarding the En Banc Hearing on Alternative Energy, Energy Conservation, and Demand Side Response. On behalf of PennFuture. November 19, 2008.

## PRESENTATIONS

Lane, C. 2019. "The RI Test." Presentation for AESP Webinar: Emerging Valuation Approaches in Cost-Effectiveness and IRPs, October 31, 2019.

Lane, C., A. Flanders. 2017. "National Grid Rhode Island: Piloting Wireless Alternatives: Forging a Successful Program in Difficult Circumstances." Presentation at the 35th Annual Peak Load Management Association (PLMA) Conference, Nashville, TN, April 4, 2017.

Lane, C. 2013. "Regional Renewable Energy Policy Update." Presentation at the Globalcon Conference, Philadelphia, PA, March 6, 2013.

Lane, C. 2012. "Act 129 and Beyond." Presentation at the ACI Mid-Atlantic Home Performance Conference, October 1, 2012.

Lane, C. 2012. "Act 129: Taking Energy Efficiency to the Next Level." Presentation at the Energypath Conference, June 28, 2012.

Lane, C. 2011. "Pennsylvania's Model Wind Ordinance." Presentation at Harvesting Wind Energy on the Delmarva Peninsula, September 14, 2011.

Lane, C. 2011. "Electric Retail Competition and the AEPS." Presentation at the Villanova Law Forum, November 4, 2011.

Lane, C. 2009. "Act 129: Growing the Energy Conservation Market." Presentation at the Western Chester County Chamber of Commerce, March 25, 2009.

*Resume updated February 2021.*