

GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE ATTORNEY GENERAL



Public Interest Division
Public Advocacy Section

E-Docketed

November 3, 2014

Ms. Brinda Westbrook-Sedgwick
Public Service Commission
of the District of Columbia Secretary
1333 H Street, NW
2nd Floor, West Tower
Washington, D.C. 20005

Re: Formal Case No. 1119 – In the Matter of the Joint Application of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC for Authorization and Approval of Proposed Merger Transaction.

Dear Ms. Westbrook-Sedgwick:

On behalf of the District of Columbia Government, I enclose for filing an original and fifteen (15) copies of the Direct Testimony of Maximilian Chang. This document is preliminarily identified as Exhibit ___ DCG (B), with an attached exhibit preliminarily identified as Exhibit ___ DCG (B)-1. If you have any questions regarding this filing, please do not hesitate to contact the undersigned.

Sincerely,

IRVIN B. NATHAN
Attorney General

/s/ Brian R. Caldwell

By:

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**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

**IN THE MATTER OF
THE MERGER OF EXELON CORPORATION,
PEPCO HOLDINGS, INC., POTOMAC ELECTRIC
POWER COMPANY, EXELON ENERGY DELIVERY
COMPANY, LLC AND. NEW SPECIAL PURPOSE
ENTITY, LLC**

Formal Case No. 1119

**Direct Testimony and Exhibits of
District of Columbia Government Witness**

MAXIMILIAN CHANG

November 3, 2014

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1 **DIRECT TESTIMONY OF MAXIMILIAN CHANG**

2 **I. INTRODUCTION**

3 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

4 A. My name is Maximilian Chang. I am a Principal Associate with Synapse Energy
5 Economics, an energy consulting company located at 485 Massachusetts Avenue,
6 Cambridge, Massachusetts.

7 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING TESTIMONY IN THIS**
8 **PROCEEDING?**

9 A. I am submitting testimony on behalf of the Government of the District of Columbia
10 (“DCG” or “the District”).

11 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL BACKGROUND AT**
12 **SYNAPSE ENERGY ECONOMICS.**

13 A. My experience is summarized in my resume, which is attached as Exhibit___DCG
14 (B)-1. I am an environmental engineer and energy economics analyst who has
15 analyzed energy industry issues for more than six years. In my current position at
16 Synapse, I focus on many aspects of the electric power industry, including assessment
17 and implementation of energy efficiency and demand response alternatives, as well as
18 economic and technical analysis of nuclear power, wholesale and retail electricity
19 markets, and renewable resource alternatives. I have been an author and project
20 coordinator for the last two biennial New England Avoided Energy Supply

1 Component reports used by energy efficiency program administrators in the six New
2 England states to evaluate energy efficiency programs.

3 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE BEFORE**
4 **BEGINNING YOUR CURRENT POSITION AT SYNAPSE ENERGY**
5 **ECONOMICS.**

6 A. Before joining Synapse Energy Economics, I worked at Environmental Health and
7 Engineering, managing indoor air quality environmental projects, at the Penobscot
8 Group analyzing real estate investment trusts on behalf of institutional investors, and
9 at Brigham and Women's Hospital conducting cancer research. I hold an M.S. degree
10 from the Harvard School of Public Health in Environmental Health and Engineering
11 Studies, and a B.S. degree from Cornell University in Biology and Classical
12 Civilizations.

13 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE UTILITY REGULATORY**
14 **AGENCIES?**

15 A. Yes. I have previously testified at the Massachusetts Department of Public Utilities,
16 and the Maine Public Utilities Commission. I have filed testimony before the New
17 Jersey Board of Public Utilities and the United States District Court District of Maine.

18 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE DISTRICT OF**
19 **COLUMBIA PUBLIC SERVICE COMMISSION?**

20 A. No, I have not.

1 **Q. WHO PREPARED THIS TESTIMONY AND THE EXHIBITS SPONSORED**
2 **THROUGH IT?**

3 A. This pre-filed declaration/testimony was prepared by me and under my direct
4 supervision and control. Likewise, the exhibits that I reference and sponsor were
5 prepared by me and under my direct supervision and control, unless I am obviously
6 referring to someone else's exhibit.

7 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

8 A. The purpose of my testimony is to evaluate whether the proposed merger ("the
9 Merger") by Exelon Corporation and Pepco Holdings Incorporated ("the Joint
10 Applicants") produces a direct and tangible benefit to ratepayers in connection with
11 the following factors that the Public Service Commission of the District of Columbia
12 ("PSC" or "the Commission") has identified.

- 13 a) **Factor 3** – Public safety and the safety and reliability of services
14 b) **Factor 4** – Risks associated with all of the Joint Applicants' affiliated non-
15 jurisdictional business operations, including nuclear operations
16 c) **Factor 7** – Conservation of natural resources and preservation of
17 environmental quality

18 I understand that other witnesses sponsored by the District will address other factors
19 and/or other elements of these identified factors.

1 **Q. WHAT IS THE SIGNIFICANCE OF A DIRECT AND TANGIBLE BENEFIT**
2 **TO RATEPAYERS IN CONNECTION WITH THE PROPOSED MERGER?**

3 A. The Commission explained in its baseline standard for merger evaluation at the outset
4 of this proceeding, in Order No. 17530 at ¶ 24, stating: “for the proposed merger to
5 be in the public interest, the proposed merger ‘must benefit the public rather than
6 merely leave it unharmed.’” The Commission also stated that: “(1) it has traditionally
7 balanced the interests of shareholders and investors with ratepayers and the
8 community; (2) benefits to the shareholders must not come at the expense of the
9 ratepayers; and (3) to be approved, the merger must produce a direct and tangible
10 benefit to ratepayers.” Order no. 17530 (6/27/14), p 10, ¶ 26. This balancing is based
11 on the Commission’s reading of the applicable statute:

12 No public utility . . . shall purchase the property of any other public utility for the
13 purpose of effecting a consolidation until the Commission shall have determined
14 and set forth in writing that said consolidation will be in the public interest, nor
15 until the Commission shall have approved in writing the terms upon which said
16 consolidation shall be made.

17
18 *Id.* p 9 ¶ 23, citing D.C. Code § 34-504. The merger under consideration ‘must
19 benefit the public rather than merely leaving it unharmed.’ *Id.*, p 9 ¶ 24, *quoting* its
20 order in Formal Case No. 1002, In the Matter of the Joint Application of Pepco and
21 the New RC, Inc. [merger creating PHI], No. 12395, rel. May 1, 2002 and *citing*
22 Formal Case No. 951, Order No. 11075, p 17, rel. October 20, 1997.

23 In its August 2014 order, the Commission revised its factors for consideration of the
24 merger:

1 **2) Revised Public Interest Factors**

2
3 124. Having considered all of the comments, we have decided to
4 revise our original six public interest factors and the Commission
5 will now consider the following seven public interest factors
6 when evaluating this proposed merger, Thus we will consider:

7
8 the effects of the transaction on: (1) ratepayers, shareholders, the
9 financial health of the utilities standing alone and as merged, and
10 the economy of the District; (2) utility management and
11 administrative operations; (3) public safety and the safety and
12 reliability of services; (4) risks associated with all of the Joint
13 Applicants’ affiliated non-jurisdictional business operations,
14 including nuclear operations; (5) the Commission’s ability to
15 regulate the new utility effectively; (6) competition in the local
16 retail, and wholesale markets that impacts the District and
17 District ratepayers; and (7) conservation of natural resources and
18 preservation of environmental quality.

19
20 Order no. 17597 (8/22/14). pp 60-61, ¶ 124. The focus, ordered the Commission, is
21 on the District of Columbia:

22 In addition “Parties are advised to focus their discovery on the
23 impact of the merger on issues that have a particular nexus with
24 the District of Columbia.”

25
26 P 61, ¶ 125. And, further, for “wholesale market issues within the jurisdiction of
27 this Commission [they] should be considered under this public interest review,
28 especially issues that affect the rates being paid by District customers. In order to
29 provide an avenue for this inquiry the Commission is revising Factor No. 6. . . .”

30 P 58, ¶118.

31 **Q. PLEASE SUMMARIZE YOUR FINDINGS AND RECOMMENDATIONS**

32 A. My findings and recommendations are summarized as:

- 1 1. The Joint Applicants have presented a flawed reliability commitment for System
2 Average Interruption Duration Index (SAIDI) that is less stringent than what is
3 required by DC Rules 15-3603 for the years after 2018.
- 4 2. The Joint Applicants' commitment to meet reliability targets within existing
5 budgets is premised on a flawed reliability statistic and has already been identified
6 to be at risk under Pepco's current planning.
- 7 3. The Joint Applicants' commitment to renewable resources is comprised generally
8 of resources located outside of the PJM footprint.
- 9 4. The Joint Applicants have not conducted or made any commitment to conduct a
10 comprehensive study of the costs and benefits associated with a high penetration
11 of distributed energy resources on the Pepco distribution system that could assist
12 the District's Sustainable DC goals.
- 13 5. Pepco has identified for itself future distributed energy resource opportunities that
14 may compete with contemplated customer owned generation.
- 15 6. The Commission should reject the petition as currently structured since the Joint
16 Applicants are proposing a SAIDI commitment that would result in less reliability
17 than what is required of Pepco under current regulation.
- 18 7. In short, the merger as proposed does not produce a direct and tangible benefit to
19 ratepayers in connection with the aspects of the Merger application that I have
20 analyzed.

1 **II. FACTOR 3: PUBLIC SAFETY AND THE SAFETY AND**
2 **RELIABILITY OF SERVICES**

3 **Q. PLEASE SUMMARIZE YOUR CONCERNS REGARDING THE JOINT**
4 **APPLICANTS' PROPOSED RELIABILITY COMMITMENTS.**

5 A. My concern is that the Joint Applicants' reliability commitment for System Average
6 Interruption Duration Index (SAIDI) is less stringent than the Commission's current
7 requirements for the period after 2018. I find this oversight or error to be a problem,
8 since Exelon witness Mark Alden states an incorrect SAIDI reliability commitment,
9 while the Pepco witness William Gausman states the Commission's current stricter
10 reliability requirement. The inconsistency within the Joint Application raises concern
11 about whether the proposed merger would result in positive benefits with regard to
12 reliability of services.

13 **Q WHAT IS THE JOINT APPLICANTS' PROPOSED RELIABILITY**
14 **COMMITMENT FOR PEPCO?**

15 A. As stated in the direct testimony of Mr. Alden, Exelon has committed that Pepco
16 meet the following System Average Interruption Frequency Index (SAIFI) and SAIDI
17 targets at the end of 2020, but measured in 2021 based on the three-year average
18 (2018-2020) performance:^{1, 2, 3, 4}

19 SAIFI: 0.54;

¹ Direct Testimony of Mark Alden. June 18, 2014. Page 8, lines 16-19

² OPC 2-21. (part b)

³ DCG 5-18. (part d)

⁴ Staff 1-17. (part a)

1 SAIDI: 107 minutes.

2 **Q. WHAT ARE PEPCO'S CURRENT RELIABILITY REQUIREMENTS?**

3 A. Under District of Columbia Municipal Regulations Title 15, Chapter 36, Section
4 3603, Pepco has to meet annual reliability levels for SAIDI and SAIFI.^{5,6,7} These
5 requirements are currently defined from 2014 through 2020 and beyond.

6 **Q. DO THE JOINT APPLICANTS PROVIDE THE PEPCO EQSS**
7 **REQUIREMENTS IN THE JOINT APPLICATION?**

8 A. As presented in Witness Gausman's testimony, Pepco's Electricity Quality of Service
9 Standards (EQSS) for future reliability levels are as follows:⁸

	2014	2015	2016	2017	2018	2019	2020
SAIDI (hours)	2.43	2.21	2.00	1.81	1.65	1.44	1.35
SAIFI	1.09	1.05	1.02	0.98	0.95	0.92	0.89

10 As noted in Witness Gausman's testimony, lower SAIDI and SAIFI numbers reflect
11 shorter outage durations and fewer interruptions.⁹ Thus, a SAIDI value that is lower
12 than the requirement would mean better reliability. Conversely, a SAIDI value that is
13 higher than the requirement would mean worse reliability.

14 **Q. WILL PEPCO'S FUTURE RELIABILITY COMMITMENT BE**
15 **CALCULATED IN THE SAME MANNER AS CURRENTLY CALCULATED?**

16 A. Yes, according to the Joint Applicants, Pepco will use the Commission's current

⁵ Direct Testimony of William Gausman. June 18, 2014. 4:1-2.

⁶ Direct Testimony of Mark Alden. June 18, 2014. 4:4-5.

⁷ Direct Testimony of Mark Alden. June 18, 2014. 3:15-16

⁸ Available at <http://www.dcregs.dc.gov/Gateway/FinalAdoptionHome.aspx?RuleVersionID=3973137>

⁹ Direct Testimony of William Gausman 3:18-19.

1 methodology for calculating SAIFI and SAIDI.^{10, 11}

2 **Q. IS THE JOINT APPLICANT’S 2020 RELIABILITY COMMITMENT**
3 **REPORTED IN THE SAME MANNER AS DC RULE 15-3603?**

4 A. No; the Joint Applicants report their 2020 Reliability Commitment as 107 minutes,
5 not in hours as documented in DC Rule 15-3603.

6 **Q. WHAT IS THE JOINT APPLICANTS’ 2020 RELIABILITY COMMITMENT**
7 **WHEN CONVERTED FROM MINUTES TO HOURS?**

8 A. When the Joint Applicants restated the 107 minutes in hours, the value is 1.78
9 hours.¹²

10 **Q. WHAT IS THE AVERAGE OF THE 2018-2020 SAIDI EQSS FOR PEPCO?**

11 A. The three-year average of the SAIDI 2018-2020 EQSS requirements is 1.48 hours, or
12 89 minutes.^{13, 14}

13 **Q. PLEASE SHOW PEPCO’S HISTORICAL RELIABILITY PERFORMANCE,**
14 **EQSS REQUIREMENTS AND THE JOINT APPLICANTS’ RELIABILTY**
15 **COMMITMENTS GRAPHICALLY.**

16 A. Figure MPC 1 and Figure MPC 2 below show the following:

¹⁰ Direct Testimony of Mark Alden 8:20-22.

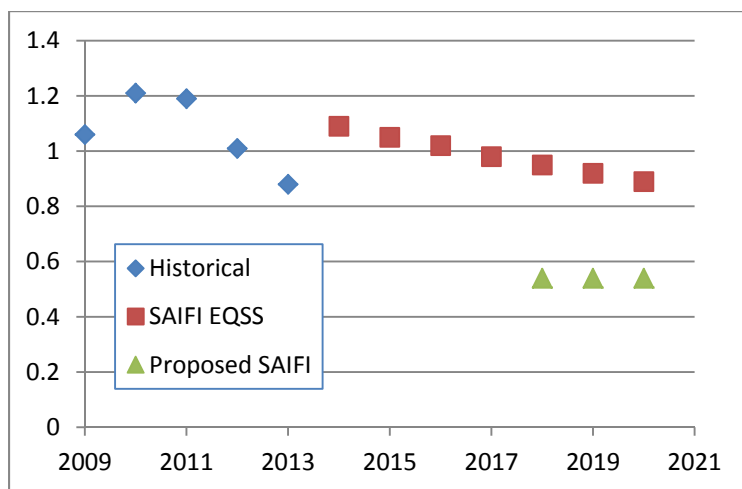
¹¹ Staff 1-17. (part b)

¹² DCG 5-18. (part b)

¹³ OPC 14-49.

¹⁴ Staff 1-17.

- 1 1. Pepco’s historical SAIFI (Figure MPC 1) and SAIDI (Figure MPC 2)
- 2 performance for the last five years;^{15,16}
- 3 2. DC EQSS Requirements (2014-2020);
- 4 3. Joint Applicants’ (2018-2020) Average SAIFI and SAIDI Commitments.



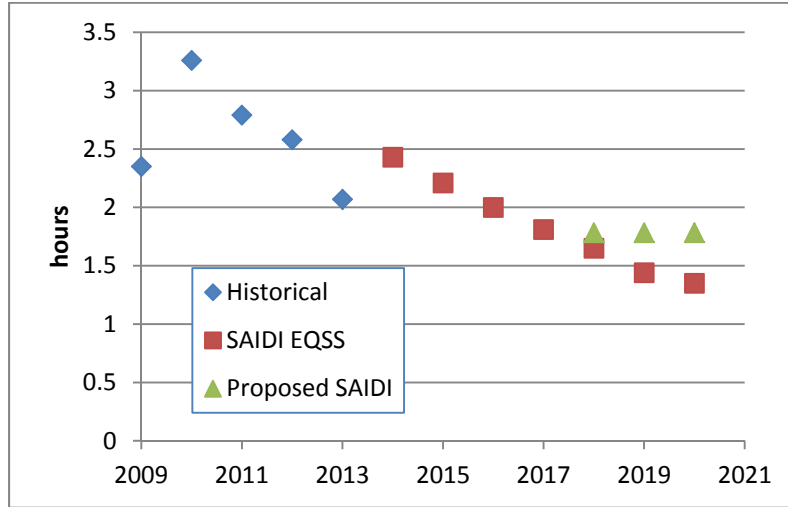
5

6 **Figure MPC 1 Pepco. SAIFI (excluding Major Service Outages): Historical (2009-2013),**

7 **EQSS Requirements (2014-2020), and Joint Applicants’ Commitments (2018-2020)**

¹⁵ Potomac Electric Power Company. 2014 Consolidated Report. February 18, 2014. Table 2.4-F2. Page 277. OPC 2-24 part a converts Table 2.4-F2 to minutes.

¹⁶ Both figures exclude Major Service Outages.



1

2 **Figure MPC 2. Pepco SAIDI (excluding Major Service Outages): Historical (2009-**
3 **2013), EQSS Requirements (2014-2020), and Joint Applicants' Commitments (2018-**
4 **2020)**

5 As shown in Figure MPC 1 and Figure MPC 2, Pepco's historical SAIFI and SAIDI
6 performance has improved since 2010. In 2014, Pepco's annual EQSS requirements
7 become progressively more stringent for both SAIFI and SAIDI on an annual basis.
8 Finally, both figures show the respective Joint Applicants reliability commitments for
9 the three year average of 2018-2020.

10 **Q. DO THE JOINT APPLICANTS ASSERT THAT THEIR PROPOSED**
11 **RELIABILITY METRICS ARE MORE STRINGENT THAN THE EQSS?**

12 A. Yes. Exelon witness Mark Alden states:¹⁷

13 Exelon's proposed levels of SAIFI and SAIDI, on average, for
14 the 2018-2020 period, backed by financial penalties, reflect our
15 substantial commitment to Pepco's customers that reliability will
16 continue to improve and, in fact, will exceed the EQSS reliability

¹⁷ Direct Testimony of Mark Alden. June 18, 2014. 9:1-5

1 requirements described in Mr. Gausman's direct testimony.

2

3

In addition, Exelon's CEO Christopher Crane states:¹⁸

4

5

6

7

Exelon intends not only to achieve compliance with the current regulatory performance requirements, but also to make further improvements in reliability metrics.

8

Q. HOW DO THE JOINT APPLICANTS' RELIABILITY COMMITMENTS COMPARE WITH THE EQSS REQUIREMENTS?

9

10

A. The Joint Applicants' proposed metrics are less stringent than the EQSS requirements for SAIDI. Figure MPC 2 shows that for SAIDI, the Joint Applicants' proposed commitment is higher or less stringent than the EQSS requirements in and after 2018. In other words, the Joint Applicants are proposing reliability commitments that would mean interruptions that are **longer** in duration than what the EQSS currently requires. Thus, if the Joint Applicants were to meet their own proposed metrics they would produce less frequent interruptions, but the interruptions would be longer than required compared to the current EQSS requirements.¹⁹

11

12

13

14

15

16

17

18

Q. WHAT IS THE EFFECT, IF ANY, OF THE JOINT APPLICANTS' SAIDI COMMITMENTS BEING LESS STRINGENT THAN THE EQSS?

19

20

A. There are two. First, and obviously, customers would be required to tolerate longer outages than required by the DC EQSS. Second, and subtler, the less stringent SAIDI commitment affects the results of the economic impact analysis that the Joint

21

22

¹⁸ Direct Testimony of Christopher Crane. June 18, 2014. 14:5-7

¹⁹ OPC 14-49

1 Applicants conducted. Witness Comings' testimony shows that using the Joint
2 Applicants' less stringent SAIDI reliability commitment value will result in *negative*
3 economic benefits or lost job-years when compared to the DC EQSS, and using the
4 same reliability calculations and methodology used by the Joint Applicants.

5 **Q. EARLIER, YOU STATE THAT THE JOINT APPLICANTS STATE A**
6 **COMMITMENT TO MEET THE EQSS. HAVE THE JOINT APPLICANTS**
7 **ASSESSED THEIR ABILITY TO MEET THE EQSS REQUIREMENTS?**

8 A. The Joint Applicants have noted in response to discovery requests that Pepco will be
9 at risk of not meeting its SAIDI EQSS requirements beginning in 2016.^{20, 21} In
10 addition, Pepco's February 2014 Consolidated Report (prior to the merger
11 announcement) noted that "...the expenditures planned in the next five years alone
12 will not achieve both SAIDI and SAIFI EQSS goals. Various process improvements
13 will also be needed to achieve the SAIDI results towards the end of the five year
14 period."²²

15 **Q. HAVE THE JOINT APPLICANTS INDICATED HOW THE PEPSCO**
16 **CURRENT DISTRIBUTION CAPITAL SPENDING BUDGETS WILL MEET**
17 **THE JOINT APPLICANTS' RELIABILITY COMMITMENTS?**

18 A. Yes. They plan to spend over \$700 million to address reliability for 2014-2018, but
19 still be at risk to not meet the Commission's SAIDI target. The Joint Applicants'

²⁰ DCG 3-46 (part a)

²¹ Confidential AOBA 1-10 Attachment A.

²² Pepco. 2014 Consolidated Report. Page 198

1 testimony states that they intend to achieve their own proposed reliability goals within
2 existing reliability-related capital budgets.²³ Further, the Joint Applicants have not
3 provided detailed plans or evaluations of how they propose to achieve improved
4 reliability, stating instead, that, as a general proposition, they intend to be more
5 efficient and productive.^{24, 25} Pepco projects planned distribution capital spending
6 consistent with budgets in Figure MPC 3 for programs through 2018. However, the
7 Joint Applicants only expect to meet their reliability standards through 2015 within
8 existing reliability-related budgets.²⁶

9 **Q. WHAT IS PEPCO'S CURRENT AND PROJECTED DISTRIBUTION**
10 **CAPITAL SPENDING?**

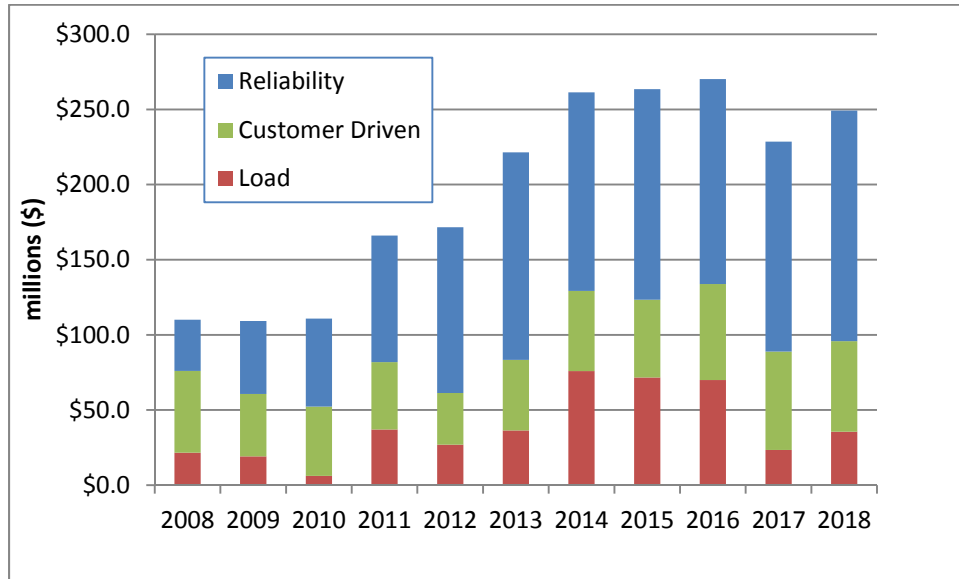
11 A. Figure MPC-3 shows the Company's historical distribution capital spending (2008-
12 2013) based on the 2014 Consolidated Report and projected distribution capital
13 budgets for the years 2014-2018 based on the response to DCG 3-39 Attachment A.

²³ Direct Testimony of Christopher Crane. June 18, 2014. 15:5-8.

²⁴ Direct Testimony of Christopher Crane. June 18, 2014. 14:20-23.

²⁵ AOBA 1-10 Confidential Attachment A.

²⁶ DCG 5-13.



1

2

Figure MPC 3. Historical (2008-2013) and Forecast (2014-2018) PEPCO

3

Distribution Capital Budgets^{27, 28}

4

The figure indicates that projected Pepco distribution capital budgets are higher than

5

historical distribution capital budgets. The 2014-2018 cumulative distribution capital

6

budget will total of \$1.28 billion over the next five years or an average of \$256

7

million per year. Pepco's reliability portion of capital budget over 2014-2018 will be

8

a cumulative \$701.8 million or approximately \$140 million per year on average.

9

These projections do not include the DC Underground Program estimates.²⁹ As I

10

noted previously, the Joint Applicants have not examined specific reductions to these

11

budgets and assert that they expect to meet all standards through just 2015 within

²⁷ Pepco. 2014 Consolidated Report. Page 36. Table 1.2-H

²⁸ DCG 5-15.

²⁹ As shown in DCG 5-15, the DC Underground project is budgeted to be an additional \$276 million over the 2014-2018 period.

1 existing reliability-related budgets.³⁰

2 **Q. IN GENERAL, ARE THE CAPITAL BUDGETS LINKED TO RELIABILITY?**

3 A. They are. But they are just one component of getting to a reliable system. For
4 instance, Attachment A of the response to DCG 5-15 details specific Pepco capital
5 reliability projects within the planned budgets.

6 **Q. ARE JOINT APPLICANTS' CAPITAL BUDGETS THROUGH 2018**
7 **ADEQUATE TO MEET PEPCO'S CURRENT AND FUTURE RELIABILITY**
8 **COMMITMENTS?**

9 A. They might be, but the Commission cannot tell this from the Application. Two issues
10 present themselves: (1) Joint Applicants have indicated that they may be at risk of
11 not meeting the EQSS starting in 2016; and (2) Pepco already acknowledges that its
12 capital budgets are insufficient ("Various process improvements will also be needed
13 to achieve the SAIDI results towards the end of the five year period.").³¹

14 **Q. ARE THERE OTHER CONSIDERATIONS BESIDES BUDGETS THAT**
15 **COULD AFFECT PEPCO'S ABILITY TO MEET ITS RELIABILITY**
16 **REQUIREMENTS?**

17 A. Yes, O&M, for instance. Pepco will need to maintain and sustain adequate staffing
18 in the District of Columbia. And linking capital and O&M are appropriate design and
19 construction standards for Pepco's distribution assets.

³⁰ DCG 5-13.

³¹ Pepco. 2014 Consolidated Report. Page 198.

1 **Q. HAVE JOINT APPLICANTS PROVIDED THE STAFFING DETAILS TO**
2 **ASSURE THE COMMISSION THAT PEPSCO WILL MEET THE**
3 **COMMISSION'S RELIABILITY TARGETS?**

4 A. No. Given the above-described projection of not meeting the Commission's SAIDI
5 requirements, and apparently inadequate budgets, the Joint Applicants should have
6 specified Pepco's reliability-related staffing for periods beyond the two-year
7 commitment.

8 Instead, the Joint Applicants have made a two-year commitment regarding
9 involuntary workforce reductions at PEPSCO.³² Assuming a 2015 merger closing, that
10 would be consistent with staffing through 2017. In response to OPC 6-6, the Joint
11 Applicants state that they have not estimated reduced employment levels at Pepco and
12 that they have not yet determined the details of the consolidation.³³ While they assert
13 that the "synergies" of consolidation will not negatively impact Pepco's
14 performance,³⁴ Mr. Comings shows that the Joint Applicants actually have identified
15 anticipated employment reductions; they just do not identify where specifically such
16 reductions will occur within the merged entity.

17 **Q. HAVE THE JOINT APPLICANTS PROVIDED DETAILS REGARDING**
18 **DESIGN AND CONSTRUCTION STANDARDS IN THE FUTURE?**

19 A. No. In response to discovery, the Joint Applicants' said that they had not yet

³² Direct Testimony of Denis O'Brien. June 18, 2014. 16:18-21.

³³ OPC 6-6.

³⁴ DCG 5-12. (part b)

1 conducted analyses on integrating:

- 2 1. Transmission and distribution assets;³⁵
3 2. Planning;³⁶
4 3. Construction Standards;³⁷ and
5 4. Asset Operations and Maintenance.³⁸

6 Such integration, they say, would take several years.³⁹

7 **Q. HAVE THE JOINT APPLICANTS STATED THAT THEY WILL SUBMIT TO**
8 **A PENALTY IF PEPCO FAILS TO MEET ITS 2020 RELIABILITY**
9 **COMMITMENTS?**

10 A. Yes. The Joint Applicants have proposed a financial penalty of a 25 basis point
11 reduction in its then-allowed return on equity in the next base rate case after January
12 1, 2021, if it has failed to meet both of their stated, not the Commission's stated,
13 SAIDI and SAIFI commitments.⁴⁰ If Pepco fails to meet one of the two Joint
14 Applicants' reliability commitments, the Joint Applicants have stated that they would
15 accept a 12.5 basis point reduction in allowed ROE.⁴¹

³⁵ DCG 5-25.

³⁶ DCG 5-25.

³⁷ DCG 5-25.

³⁸ DCG 5-25.

³⁹ Direct Testimony of Carim Khouzami. June 18, 2014. 19:15.

⁴⁰ Kouzami. 28:3-4.

⁴¹ Kouzami. 28:18-20.

1 **Q. SO, HOW MEANINGFUL IS THIS PROPOSAL IN LIGHT OF YOUR**
2 **ANALYSIS?**

3 A. It is not meaningful, because their proposed SAIDI commitment does not met the
4 Commission's EQSS requirements.

5 **Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING YOUR**
6 **RELIABILITY CONCERNS?**

7 A. I have determined, and I recommend that the Commission conclude that the Joint
8 Applicants' reliability commitments will not meet the Commission's own reliability
9 requirements for SAIDI. As a result, the merger as proposed would not provide a
10 direct and tangible benefit to ratepayers for Factor 3. In addition, the Commission
11 should reaffirm that Pepco's obligation to comply with the Commission's EQSS is
12 entirely independent of the proposed merger. It does not appear that the Joint
13 Applicants' reliability "commitments" furnish a rationale for approving the proposed
14 merger for Factor 3.

15 **Q: ASSUMING THAT THE MERGER IS APPROVED, DO YOU RECOMMEND**
16 **THAT THE COMMISSION SET ANY CONDITIONS OR LIMITS?**

17 A: Yes, I recommend the following conditions from Exhibit___DCG (A)-2 be
18 implemented: (15) and (16) for funding to insure that the Commission and
19 intervenors have sufficient resources to monitor and promote the Commission's
20 reliability requirements; (23) and (24) to insure local staffing that will be sensitive to
21 the District's reliability needs; and (30) to insure adequate related spending levels.

1 **III. FACTOR 4 - RISKS ASSOCIATED WITH ALL OF THE JOINT**
2 **APPLICANTS' AFFILIATED NON-JURISDICTIONAL BUSINESS**
3 **OPERATIONS, INCLUDING NUCLEAR OPERATIONS.**

4 **Q. PLEASE ADDRESS FACTOR 4, WHICH ADDRESSES: “RISKS**
5 **ASSOCIATED WITH ALL OF THE JOINT APPLICANTS' AFFILIATED**
6 **NON-JURISDICTIONAL BUSINESS OPERATIONS, INCLUDING**
7 **NUCLEAR OPERATIONS.”**

8 A. The Joint Applicants have identified eight nuclear units that may be at risk of
9 premature retirement. In summary, and, assuming a merger, the Commission should
10 ensure that Joint Applicants' proposed ring-fencing measures ensure that Pepco
11 ratepayers will be protected from the entirety of future nuclear decommissioning
12 costs for even one unit, since the decommissioning process for any one unit may last
13 up to 60 years.

14 **Q. PLEASE SUMMARIZE EXELON'S NUCLEAR GENERATION FLEET**
15 **CAPACITY AND LOCATION OF EXELON'S NUCLEAR UNITS.**

16 A. As stated in Witness Crane's testimony, Exelon has one of the largest nuclear
17 generation fleets in the country.⁴² The nuclear fleet as of 12/31/2013 represented
18 approximately 55 percent of Exelon's generation capacity.⁴³ The 23 nuclear reactors
19 are in six states: Illinois, Maryland, Nebraska, New Jersey, New York, and

⁴² <http://www.exeloncorp.com/energy/generation/nuclear.aspx>. Accessed October 23, 2014

⁴³ Joint Applicants. September 19, 2014. Exhibit-21-(2). Page 16 of 106.

1 Pennsylvania.^{44, 45}

2 **Q. HOW LONG DOES IT TAKE TO DECOMMISSION THE SIZE NUCLEAR**
3 **PLANTS THAT EXELON OWNS AND OPERATES?**

4 A. As indicated by the Joint Applicants, the decommissioning process is allowed to take
5 up to 60 years for any one unit.⁴⁶

6 **Q. HAS EXELON PUBLICALLY HIGHLIGHTED CONCERNS REGARDING**
7 **NUCLEAR GENERATION OPERATIONS?**

8 A. Yes, in Exelon's 2013 Sustainability Report, Exelon noted that:⁴⁷

9 Due to a variety of factors, such as low natural gas prices and the
10 unintended consequences of government subsidies for certain
11 types of new generation, there is the potential for premature
12 nuclear unit retirements in the United States.

13 The Joint Applicants identified eight of Exelon's nuclear units that were at risk.⁴⁸

14 These eight units are:⁴⁹

⁴⁴ Available at <http://www.exeloncorp.com/energy/generation/generation.aspx>. Accessed October 23, 2014

⁴⁵ DCG 2-40.

⁴⁶ DCG 7-19.

⁴⁷ Joint Applicants. September 19, 2014. Exhibit-21-(2). Page 4 of 106

⁴⁸ DCG 7-19.

⁴⁹ DCG 2-40, Attachment A.

Unit	Location	Net Rating (MW)	Year of License Expiration
Bryon Unit 1	Illinois	1,186	2024
Bryon Unit 2	Illinois	1,158	2026
Clinton	Illinois	1,069	2026
Quad City 1	Illinois	934	2032
Quad City 2	Illinois	937	2032
Oyster Creek	New Jersey	625	2019
GINNA	New York	576	2029
Nine Mile Point Unit 1	New York	618	2029

1 For these eight units, a “premature retirement” would be the end of commercial
2 operation at a date in advance of the expiration of the nuclear Regulatory
3 Commission (NRC) license.

4 **Q. WHAT WOULD BE THE RESULT OF EARLIER THAN EXPECTED**
5 **RETIREMENT OF ANY OF THE EIGHT NUCLEAR UNITS?**

6 A. The Joint Applicants describe the impact of a premature unit retirement and the
7 resulting impact on decommissioning funds in response to DCG 7-19.⁵⁰ Because
8 decommissioning is not merely a technical or safety matter, but also a financial one,
9 the robustness of each plant’s decommissioning savings, the decommissioning fund,
10 is important. The current status of Exelon’s decommissioning fund for each unit is
11 provided in response to DCG 2-41.⁵¹ The Joint Applicants contend that Exelon
12 Corporation would be solely responsible for decommissioning costs if it gave its
13 corporate parental guarantee and that Pepco would not bear any liability for nuclear

⁵⁰ DCG 7-19.

⁵¹ DCG 2-41.

1 decommissioning of Exelon Generation units.⁵²

2 **Q. DO YOU HAVE CONCERNS?**

3 A. Yes, I do. Although it is not known whether or when any of the identified units will
4 retire prematurely, and that the Joint Applicants assert that Pepco ratepayers will not
5 bear any liability for decommissioning costs, the decommissioning process is allowed
6 to take up to 60 years for any one unit.⁵³ This 60-year time period extends well
7 beyond the five-year ring fencing commitments made by the Joint Applicants.

8 **Q. WHAT ARE YOUR RECOMMENDATIONS?**

9 A. I recommend that the Commission require the strongest protections for Pepco from
10 the effects of Exelon nuclear plant retirement, premature or otherwise. Also, due to
11 the time periods involved, I recommend that the protections extend as far as the
12 potential end to decommissioning of each of Joint Applicants' nuclear plants.

13 **Q: ASSUMING THAT THE MERGER IS APPROVED, DO YOU RECOMMEND**
14 **THAT THE COMMISSION SET ANY CONDITIONS OR LIMITS?**

15 A: Yes, I recommend the following conditions from Exhibit ___ DCG (A)-2 be
16 implemented, based on my understanding of the testimony of Witnesses Smith and
17 Wilson: (10) and (11) to distance and separate Pepco and its customers from the
18 effects of nuclear-related risks, including bankruptcy.

⁵² DCG 7-19. (part b)

⁵³ DCG 7-19.

1 **IV. FACTOR 7 – CONSERVATION OF NATURAL RESOURCES AND**
2 **PRESERVATION OF ENVIRONMENTAL QUALITY.**

3 **Q. WHAT IS YOUR UNDERSTANDING OF THE DISTRICT’S APPROACH TO**
4 **RENEWABLES AND DISTRIBUTED GENERATION?**

5 A. DC Government Witnesses Chambers and Shane thoroughly addresses this matter.
6 My comments should be taken within the context of their explanation of the District’s
7 vision and objectives. I would classify my concerns within the context of the
8 Commission’s Factor 7.

9 **Q. PLEASE SUMMARIZE YOUR CONCERNS REGARDING THE JOINT**
10 **APPLICANTS’ ABILITY TO CONSERVE NATURAL RESOURCES AND**
11 **PRESERVE ENVIRONMENTAL QUALITY?**

12 A. The Joint Applicants’ renewable energy resources are located, in general, outside of
13 the PJM footprint. Thus, they provide fewer direct electric and capacity benefits to
14 the District. In addition, the Joint Applicants should assist the District’s Sustainable
15 DC distributed energy resource penetration goals by starting with comprehensive
16 studies of the effect of distributed energy resources on the distribution system to
17 assess all costs and benefits.

18 **Q. DOES EXELON PROVIDE THE GENERAL LOCATION OF ITS**
19 **RENEWABLE ENERGY RESOURCES?**

20 A. Yes.

1 **Q. WHERE ARE THESE RESOURCES LOCATED?**

2 A. Almost none in the District of Columbia, and mostly not near it. A summary of
3 Exelon's renewable resources is shown below:^{54 55}

	Exelon (MW)	PJM (MW)	DC (MW)	Location
Wind	1,300	78	0	Maryland, Illinois
Solar Utility	240	10	0	Illinois
Distributed Generation	173	56.9	0.5	Ohio, New Jersey, Maryland, DC

4 **Q. HOW MANY ARE LOCATED IN THE DISTRICT OF COLUMBIA?**

5 A. Only 0.5 MW of distributed generation out of Exelon's 173 MW are physically
6 located in the District of Columbia. Of the wind and solar utility-scale resources,
7 none are located in the District of Columbia.

8 **Q. HOW MANY ARE LOCATED WITHIN THE PJM FOOTPRINT?**

9 A. Overall not much. Only 56.9 MW of distributed generation out of Exelon's 173 MW
10 are physically located in the PJM footprint. Of the wind resources, 78 MW of the
11 1,300 MW of wind are located in the PJM footprint. Of the solar utility-scale
12 resources, 10 MW of the 240 MW of solar utility resources are located in the PJM
13 footprint

14 **Q. DOES EXELON OWN COAL, OIL, AND NATURAL GAS GENERATION?**

15 A. Yes, as of December 31, 2013 Exelon owns 1,298 MW of coal-fired capacity, 1,006
16 MW of oil-fired, and approximately 9,900 MW of natural gas and oil/natural gas fired

⁵⁴ DCG 1-62.

⁵⁵ DCG 5-41.

1 generation.⁵⁶ The approximately 12,204 MW of fossil-fueled generation resources is
2 much larger than the approximately 1,700 MW of renewable resources owned by
3 Exelon. (Please note that Exelon’s 3rd Q 2014 press release announced that Exelon
4 had entered into a sales agreement to sell its share of two coal-fired plants in Western
5 Pennsylvania.)⁵⁷

6 **Q. HAVE THE JOINT APPLICANTS CONDUCTED STUDIES TO EVALUATE**
7 **THE IMPACT OF DISTRIBUTED GENERATION WITHIN THE**
8 **DISTRIBUTION UTILITY SERVICE TERRITORIES?**

9 A. The Joint Applicants have not conducted or commissioned studies that have
10 investigated the amount of distributed energy resources (“DER”) that will be installed
11 in the future or larger system studies should DER be a larger part of their distribution
12 system.^{58, 59}

13 **Q. ARE THESE STUDIES IMPORTANT TO CONDUCT?**

14 A. Yes. These studies, if conducted properly, would provide very important information
15 to stakeholders interested in understanding the potential for distributed generation
16 within the District of Columbia. Here are some areas that merit such work:

17 • The DC Sustainable Plan Action item 2.3 identifies the goal of 1,000 additional
18 residential and commercial renewable energy projects in the medium term.⁶⁰ Pepco is

⁵⁶ Joint Applicants. September 19, 2014. Exhibit-21-(2). Page 16 of 106

⁵⁷ http://www.exeloncorp.com/Newsroom/pr_20141029_EXC_Q3Earnings.aspx

⁵⁸ DC Sun 1-6.

⁵⁹ DC Sun 1-5.

⁶⁰ Sustainable DC. Page 60. Available at

- 1 already undertaking activities to streamline the application process.⁶¹ A
- 2 comprehensive assessment could help establish a general framework and detailed
- 3 understanding of opportunities that could further improve upon the process to
- 4 streamline applications in the context of the District's medium term goal of 1,000
- 5 additional renewable energy projects.
- 6 • The DC Sustainable Plan Action item 2.4 identifies the goal of community solar and
7 renewable energy systems through legislation. This goal would also benefit from a
8 study that provided a general framework; for example, a single comprehensive study
9 of Pepco's distribution circuits' characteristics rather than come at the circuit through
10 a series of unrelated small projects.
 - 11 • Pepco⁶² also notes that utilities are not realizing the full value of DER.⁶³ A more
12 comprehensive study of all of the benefits and costs of DER on the distribution
13 system would be valuable for stakeholders.
 - 14 • Such studies would be valuable to identify possible opportunities and challenges with
15 other capital spending initiatives, like meeting reliability needs with locally reliable
16 distributed generation, notwithstanding Pepco's concerns.⁶⁴
 - 17 • Studies may help frame and prioritize ongoing and future efforts to integrate DER
18 that are currently contemplated, and that would be valuable to stakeholders.⁶⁵

http://sustainable.dc.gov/sites/default/files/dc/sites/sustainable/page_content/attachments/DCS-008%20Report%20508.3j.pdf

⁶¹ DC Sun 1-4. Attachment Q. (page 25 of 28).

⁶² DC Sun 1-4. Attachment Q.(page 14 of 28)

⁶³ DC Sun 1-4. Attachment Q.(page 2 of 28)

⁶⁴ DC Sun 1-4. Attachment Q. (page 14 of 28)

1 **Q. HAVE THE JOINT APPLICANTS EXPRESSED SUPPORT FOR**
2 **DISTRIBUTED GENERATION?**

3 **A.** They appear to have, in response to discovery, with “Exelon supports customer
4 choice and competitive markets, including customers’ use of distributed generation to
5 meet their energy needs.”^{66, 67} Pepco says that its approach to solar interconnections
6 supports solar installations.⁶⁸

7 **Q. DO YOU HAVE CONCERNS REGARDING JOINT APPLICANTS’**
8 **ACTIONS REGARDING CUSTOMER INITIATIVES?**

9 **A.** Yes I do. Notwithstanding the above, the Joint Applicants have identified threats to
10 them from distributed generation. Specifically, Pepco has indicated that PV displaces
11 energy and, therefore, revenue.⁶⁹ Further Exelon seems to be concerned that customer
12 owned generation could negatively affect the utility industry.⁷⁰

13 Also, Pepco appears to have identified future opportunities for itself, including some
14 opportunities that could compete with its customers’ DER. The identified
15 opportunities include:⁷¹

16 ○ Grid and Distributed Energy Resource Management (Additional control
17 equipment into rate base);

⁶⁵ DC Sun 1-4. Attachment Q. (pages 25, 27 of 28)

⁶⁶ Grid 2.0 1-27.

⁶⁷ DC Sun 1-11.

⁶⁸ DC Sun 1-4. Attachment T

⁶⁹ DC Sun 1-4. Attachment Q (page 14 of 28)

⁷⁰ Exelon 2013 10 K. page 44.

⁷¹ DC Sun 1-4. Attachment Q (page 24 of 28)

- 1 ○ Central management of DER to maximize benefit;
- 2 ○ PHI-owned solar, community solar, wind, Combined Heat and Power (CHP);
- 3 ○ PHI-owned battery systems, ancillary services; and
- 4 ○ PHI-owned/operated microgrids.

5 I am concerned that Pepco would take actions to make it harder for its customers to
6 initiate such measures, seeing them as potentially competing with its own
7 opportunities.

8 **Q. DO YOU HAVE ADDITIONAL CONCERNS SHOULD THE MERGER**
9 **PROCEED?**

10 A. Yes, I fear a worsening of the status quo for solar projects. The status quo is
11 apparently that solar projects can get connected. PHI has indicated that it has to date,
12 successfully completed 99 percent of all interconnections requests for net energy
13 metering and that it maintains a local office within the District of Columbia to handle
14 interconnection requests within the Pepco service territory.^{72, 73} It is not known how
15 the Merger would impact the Pepco interconnection process or the maintenance of the
16 local District of Columbia office. At the very least, assuming the Merger is approved,
17 there should be no degradation of the Pepco interconnection process.

⁷² DC Sun 1-4 Attachment Q (page 20 of 28)

⁷³ DC Sun 1-4 Attachment Q (page 21 of 28)

1 **Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE JOINT**
2 **APPLICANTS' RENEWABLE ENERGY RESOURCES?**

3 A. I recommend that the Commission encourage the development of cost-effective
4 renewable generation and distributed generation that can help serve the needs of
5 Pepco's District of Columbia ratepayers. Of the 1,700 MW of renewable and
6 distributed resources in Exelon's generation fleet; 1,568 MW, or approximately 91
7 percent, are located outside the PJM footprint that includes the District of Columbia.
8 Meanwhile Exelon owns some 12,000 MW of fossil fuel generation resources.

9 **Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING DISTRIBUTED**
10 **ENERGY RESOURCES?**

11 A. My recommendation parallels those for renewables. Because of the above-stated
12 concerns, I recommend that the Commission require no less effort than at present to
13 accommodate customer interest in DER. Further, I urge that the Commission require
14 a comprehensive analysis of the accommodation of higher penetrations of DER into
15 the Pepco distribution system, factoring in all costs and benefits.

16 **Q. TO WHAT EXTENT DO YOU CONCLUDE THAT JOINT APPLICANTS'**
17 **PRESENTATION DEMONSTRATES FACTOR 7 BENEFITS FOR**
18 **RENEWABLES AND DER?**

19 A. I do not find that the Joint Applicants have shown that the merger will provide any
20 benefits in these areas.

1 **Q: ASSUMING THAT THE MERGER IS APPROVED, DO YOU RECOMMEND**
2 **THAT THE COMMISSION SET ANY CONDITIONS OR LIMITS?**

3 A: Yes, I recommend the following conditions from Exhibit___DCG (A)-2 be
4 implemented, based on my understanding of the testimony of Witnesses Smith and
5 Wilson: (13) through (16), (36) and (37), to maximize market competition and
6 attention to the District's green power needs.

7 **Q. DO YOU REQUEST THAT THIS PRE-FILED TESTIMONY AND RELATED**
8 **EXHIBITS BE ENTERED INTO THE RECORD OF THIS CASE?**

9 A. Yes, I do. I have signed a declaration that my foregoing testimony is true and correct.
10

11 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

12 A. Yes.



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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Principal Associate*, 2013 – present, *Associate*, 2008 – 2013.

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Environmental Health and Engineering, Newton, MA. *Senior Scientist*, 2001 – 2008.

Managed complex EPA-mandated abatement projects involving polychlorinated biphenyls (PCBs) in building-related materials. Provided green building assessment services for new and existing construction projects. Communicated and interpreted environmental data for clients and building occupants. Initiated and implemented web-based health and safety awareness training system used by laboratories and property management companies.

The Penobscot Group, Inc., Boston, MA. *Analyst*, 1994 – 2000.

Authored investment reports on Real Estate Investment Trusts (REITs) for buy-side research boutique. Advised institutional clients on REIT investment strategies and real estate asset exchanges for public equity transactions. Wrote and edited monthly publications of statistical and graphical comparison of coverage universe.

Harvard University Extension School, Cambridge, MA. *Teaching Assistant*, 1995 – 2002.

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Brigham and Women's Hospital, Boston, MA. *Cancer Laboratory Technician*, 1992 – 1994.

Studied the biological mechanism of tumor eradication in mouse and human models. Organized and performed immunotherapy experiments for experimental cancer therapy. Analyzed and authored results in peer-reviewed scientific journals.

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Master of Science in Environmental Science and Engineering, 2000

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TESTIMONY

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New Jersey Board of Public Utilities (Docket No. GO12050363): Testimony regarding the petition of South Jersey Gas Company for approval of the extension of energy efficiency programs and the associated cost recovery mechanism pursuant to N.J.S.A 48:3-98:1. On behalf of the New Jersey Division of Rate Counsel. November 9, 2012.

Resume dated October 2014

I declare under penalty of perjury that the foregoing testimony is true and correct to the best of my knowledge, information, and belief.

Executed this 3rd day of November, 2014.

A handwritten signature in blue ink, appearing to read 'Maximilian Chang', written in a cursive style.

Maximilian Chang

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of November, 2014, I caused true and correct copies of the foregoing DCG Direct Testimony of Maximilian Chang to be electronically delivered to the following parties:

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