

**BEFORE THE STATE OF NEW JERSEY  
BOARD OF PUBLIC UTILITIES**

IN THE MATTER OF THE PETITION OF PUBLIC )  
SERVICE ELECTRIC AND GAS COMPANY FOR )  
APPROVAL OF ITS OF ITS CLEAN ENERGY ) BPU DOCKET Nos.  
FUTURE-ENERGY EFFICIENCY ("CEF-EE") ) GO18101112 and EO18101113  
PROGRAM ON A REGULATED BASIS )

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**DIRECT TESTIMONY OF EZRA D. HAUSMAN, PH.D.  
ON BEHALF OF THE  
DIVISION OF RATE COUNSEL**

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**Dated: March 22, 2019**

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I. Professional Qualifications and Purpose of Testimony

**Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.**

A. My name is Ezra D. Hausman, Ph.D. I am an independent consultant doing business as Ezra Hausman Consulting, operating from offices at 77 Kaposia Street, Auburndale, Massachusetts 02466.

**Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?**

A. I hold a BA in Psychology from Wesleyan University, an MS in Environmental Engineering from Tufts University, an SM in Applied Physics from Harvard University, and a PhD in Atmospheric Chemistry from Harvard University. I have been involved in analysis of both regulated and restructured electricity markets for over 20 years. I have provided a detailed resume as Attachment EDH-1.

I have worked as an independent consultant and expert based on my expertise and experience in energy economics and environmental science since 2014. From 2005 until early 2014, I was employed at Synapse Energy Economics, Inc., a research and consulting Company located in Cambridge, Massachusetts, where I served most recently as Vice President and Chief Operating Officer. At Synapse, and continuing as an independent consultant, I served as an analyst and expert in several areas related to my expertise and experience in energy economics. Specific areas include:

- State and regional energy, capacity, and transmission planning, including both utility resource planning and long-term (multi-decadal) climate-constrained resource planning
- Electricity, generating capacity, and demand-side resource market design and analysis

- 1 • Review and analysis of utility energy efficiency (“EE”) program filings
- 2 • Electric system dispatch modeling
- 3 • Economic analysis of environmental and other regulations, including greenhouse gas
- 4 regulation, in electricity markets
- 5 • Economic analysis, price forecasting, and asset valuation in electricity markets
- 6 • Quantification of the economic and environmental benefits of displaced emissions and
- 7 market price impacts associated with energy efficiency and renewable energy
- 8 • Regulation and mitigation of greenhouse gas emissions from the supply and demand
- 9 sides of the U.S. electricity sector

10 I have testified or appeared before public utility commissions and/or legislative  
11 committees in Arizona, Florida, Illinois, Idaho, Iowa, Kansas, Louisiana, Maryland,  
12 Massachusetts, Minnesota, Mississippi, Missouri, North Carolina, New Hampshire, New  
13 Jersey, Nevada, South Carolina, South Dakota, Vermont, Virginia, and Washington State,  
14 as well as at the federal level. I have provided expert representation for stakeholders at  
15 the PJM RTO, at MISO, and at the FERC. My testimony and analytical work have  
16 centered on issues in electricity market economics, along with cases involving natural gas  
17 conservation planning and greenhouse gas mitigation in the electric sector.

18 Prior to joining Synapse, I was employed from 1998 through 2004 as a Senior Associate  
19 at Tabors Caramanis and Associates (TCA) of Cambridge, Massachusetts. In 2004, TCA  
20 was acquired by Charles River Associates (CRA), where I remained until I joined  
21 Synapse in 2005. At TCA/CRA, I performed a wide range of electricity market and  
22 economic analyses and price forecast modeling studies. These included asset valuation

1 studies, market transition cost/benefit studies, market power analyses, and litigation  
2 support. I have extensive experience with market simulation, production cost modeling,  
3 and resource planning methodologies and software.

4 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NEW JERSEY BOARD**  
5 **OF PUBLIC UTILITIES (“BPU”, OR “BOARD”)?**

6 A. Yes. I filed written testimony in PSE&G’s most recent energy efficiency program (“EE  
7 2017”) filing (BPU Docket No. EO17030196) and in Rockland Electric’s low  
8 income/energy efficiency filing (BPU Docket No. ER17080869).

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

10 A. The purpose of my testimony is to address issues related to the Clean Energy Future –  
11 Energy Efficiency (“CEF-EE”) Program filing (“Petition”) submitted by Public Service  
12 Electric and Gas (“PSE&G” or, “the Company”).

13 In its filing, PSE&G has proposed seven Residential subprograms and seven Commercial  
14 and Industrial (“C&I”) subprograms, along with eight pilot subprograms. The Company  
15 proposes to offer these programs over a six-year period, with a total budget (including  
16 administrative expenses during and after the six-year period) of \$2.78 billion. This  
17 proposal would constitute a very significant increase in the PSE&G’s energy efficiency-  
18 related activities. All of the subprograms proposed would be either new to PSE&G or a  
19 major expansion of its existing programs. Further, the Company’s proposed budget  
20 would represent approximately an 11-fold increase over the stipulated spending for the

1 EE 2017 programs on an annualized basis. In addition, the Company proposes to become  
2 “the exclusive provider of regulated energy efficiency programs in its service territory.”<sup>1</sup>

3 In my testimony, I address the Company’s overall plan as described above. I also raise  
4 issues with the cost-effectiveness analysis (“CBA”) prepared for the company by its  
5 consultant Gabel and Associates.

6 **Q. WHAT INFORMATION HAVE YOU REVIEWED IN PREPARATION OF THIS**  
7 **TESTIMONY?**

8 A. I have reviewed the Company’s Petition, supporting testimony, workpapers, and  
9 discovery responses provided pursuant to questions propounded by Rate Counsel and  
10 other parties. I have also had the opportunity to ask the Company questions directly  
11 during discovery conference calls held on March 6 and March 14, 2019. I have performed  
12 a detailed analysis of the CBA prepared by Gabel and Associates and provided as a  
13 workpaper for PSE&G Witness Karen Reif in support of the Company’s programs.<sup>2</sup>  
14 Finally, I have reviewed Board Orders and stipulations related to previous iterations of  
15 the Company’s EE programs, including its recent EE 2017 program, and other  
16 information on the performance of these earlier EE programs.

17 **II. Summary of Conclusions and Recommendations**

18 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE COMPANY’S**  
19 **OVERALL PROPOSAL?**

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<sup>1</sup> Petition, page 2.

<sup>2</sup> A summary calculation of the original CBA results were provided as Schedule KR-CEF-EE-2 Appendix E. An updated version of the analysis was later provided to the parties in a file named “WP-KR-CEF-EE-1-R1 - CONFIDENTIAL.xlsx”, which is the version upon which I rely for my testimony.

1     A.     PSE&G claims that its proposed significant expansion of its energy efficiency program is  
2           responsive to the recently signed Clean Energy Act (“CEA”)<sup>3</sup> and to the desire of the  
3           Legislature and Governor Murphy for increased use of clean energy and energy  
4           efficiency resources.<sup>4</sup> However, the Board is currently conducting a stakeholder process  
5           and has yet to make crucial determinations regarding the interpretation and requirements  
6           of the CEA, and the market potential studies mandated by the CEA are currently  
7           underway. The CEA itself sets a timeline for this process.<sup>5</sup> Thus, the Company is  
8           premature in its filing.

9           PSE&G does not have the authority to impose its own interpretation of the CEA  
10          mandates in order to direct billions of ratepayer dollars to its proposed programs. It is the  
11          Board’s responsibility to set targets and define Quantitative Performance Indicators  
12          (“QPI”) under the CEA. The Board, and not the individual utilities, “shall establish  
13          reasonably achievable targets for energy usage reductions and peak demand reductions,”  
14          and these targets are to take into account various non-utility policies and programs.<sup>6</sup> The  
15          Board has not yet set QPIs for the State’s electric distribution (“EDC”) and gas  
16          distribution (“GDC”) companies.

17          Nor does the CEA require, anticipate, or justify the Company’s displacement of the  
18          BPU’s Office of Clean Energy’s (“OCE”) ongoing, successful, and cost-effective energy

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<sup>3</sup> See CEA portion codified at N.J.S.A. 48:3-87.9

<sup>4</sup> See, for example,

[https://www.nj.gov/governor/news/news/562018/approved/20180523a\\_cleanEnergy.shtml](https://www.nj.gov/governor/news/news/562018/approved/20180523a_cleanEnergy.shtml).

<sup>5</sup> Specific timetables are provided in each subsection of N.J.S.A. 48:3-87.9.

<sup>6</sup> N.J.S.A. 48:3-87.9(c).

1 efficiency programs under the New Jersey Clean Energy Program (“NJCEP”) in its  
2 service area. The Company should work with the OCE and other stakeholders to develop  
3 a framework for EE programs that comports with the provisions and timetables of the  
4 CEA.

5 Under its proposal, PSE&G would leapfrog the Board’s responsibility to define utility  
6 obligations under the CEA and redefine the role of the OCE, proposing that the  
7 opportunity for input and coordination with the OCE and other stakeholders would come  
8 *after* Board approval of PSE&G’s programs. The “transition plan” provided by the  
9 Company (Exhibit 1 to Ms. Reif’s supplemental testimony) only underscores this point.  
10 Notably, PSE&G’s transition plan lacks specifics. PSE&G’s proffered “transition plan” is  
11 essentially “to schedule a series of transition meetings between PSE&G and the OCE  
12 staff”, which PSE&G recommends “begin within a short time following Board  
13 approval.”<sup>7</sup> PSE&G then provides a table with vague descriptions of what it suggests for  
14 OCE vs. utility functions under a future configuration. This discussion does not represent  
15 a plan – it would be better described as an opening “vision statement” that might be used  
16 to initiate a discussion. It is far too vague to support Board consideration, much less  
17 approval, and it does not reflect input from other stakeholders, or determinations from the  
18 Board. Finally, PSE&G’s proffered “transition plan” does not address the collection or  
19 disposition of the SBC funds that currently support OCE programs in its service territory,  
20 a topic that has significant bearing on the ultimate cost to ratepayers.

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<sup>7</sup> Supplemental Direct Testimony of Karen Reif, Exhibit 1, page 2.



1       Until the Board, the OCE and other stakeholders have had an opportunity to collaborate  
2       on implementation of the CEA and establish energy saving and peak reduction targets  
3       and QPIs, the Board should not permit the Company to “go it alone” by supplanting state  
4       programs. Nor should the Board permit PSE&G to move forward with such a vague and  
5       one-sided transition plan. Any reshuffling of roles in the provision of crucial energy  
6       efficiency services to ratepayers requires a thorough and comprehensive transition plan,  
7       prepared in coordination with OCE and other stakeholders.

8       **Q.   WHAT ARE YOUR CONCLUSIONS REGARDING THE COMPANY’S COST-**  
9       **BENEFIT ANALYSES?**

10      I find the Company’s Cost-Benefit Analyses (“CBA”) deficient in that they contain  
11      numerous errors that render the results for the Participant Cost Test (“PCT”), the Program  
12      Administrator Cost Test (“PAC”) the Ratepayer Impact Measure Test (“RIM”) and the  
13      Societal Cost Test (“SCT”) unreliable for assessing the cost effectiveness of the proposed  
14      programs. Specific issues with PSE&G’s application of the SCT are also addressed in the  
15      direct testimony of Rate Counsel witness David Dismukes.

16      **Q.   WHAT ARE YOUR RECOMMENDATIONS FOR THIS BOARD?**

17      A.    I make the following recommendations:

- 18      •   The Board should reject the Company’s overall proposal for a six-year, \$2.78 billion  
19      program, predicated as it is on PSE&G becoming the exclusive provider of regulated  
20      energy efficiency services in its service territory.
- 21      •   If the Board decides that an interim EDC EE program is needed pending the completion  
22      of the studies and processes mandated by the CEA, the Board should direct the Company

1 to continue its existing EE subprograms for a period of two additional years at a funding  
2 level consistent with the stipulated levels approved in its EE 2017 program, pending  
3 Board's establishment of energy efficiency targets, QPIs and other items pursuant to the  
4 CEA.

- 5 • The Board should direct the Company to initiate the review of cost effectiveness and  
6 incentive levels under its EE 2017 Programs, as directed under paragraph 15 of the  
7 Stipulation of Settlement for its EE 2017 filing.<sup>8</sup>
- 8 • The Company should be directed to submit cost-benefit analyses in any future filings that  
9 follow standard practices, remedying the flaws found in the cost-benefit analyses  
10 submitted in its Petition, as discussed in my testimony and that of Rate Counsel witness  
11 David Dismukes.
- 12 • PSE&G should be directed to develop a clear and readily accessible policy regarding the  
13 collection and use of customer data which addresses the privacy, security and use of  
14 customer data. No identifiable customer data acquired by the Company should be used by  
15 PSE&G or any third party other than for the provision of regulated electric and gas  
16 service. In addition, should PSE&G or any third party use aggregated and anonymized  
17 data for any commercial purpose, the resulting revenue should accrue to PSE&G's  
18 ratepayers to offset program costs.

19 III. Proposed Subprograms and Proposal to Establish PSE&G as  
20 Exclusive Provider of Regulated Energy Efficiency Services

21 a. Proposed Residential Subprograms

22 Q. WHAT ARE THE SPECIFIC RESIDENTIAL SUBPROGRAMS IN THE  
23 COMPANY'S PROPOSAL AS FILED, AND HOW DO THEY COMPARE TO

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<sup>8</sup> Stipulation of Settlement under BPU Docket No. EO17030196, Order No. 8-23-17-8C.

**THE SUBPROGRAMS INCLUDED IN THE COMPANY'S EE 2017 PROGRAM  
AND TO PROGRAMS AND INCENTIVES OFFERED UNDER THE NJCEP?**

A. Table 1 lists each of the proposed residential subprograms, along with identification of related subprograms from the Company's current EE 2017 program, as well as NJCEP offerings, as described in PSE&G Schedule KR-CEF-EE-1.

**TABLE 1. PROPOSED RESIDENTIAL SUBPROGRAMS VS. EXISTING OFFERINGS**

<b>Proposed Subprogram</b>	<b>Proposed Budget (\$million)</b>	<b>PSE&amp;G EE 2017</b>	<b>Related NJCEP/BPU Program(s)</b>
Residential Efficient Products	\$280.0	Smart Thermostats	Energy Efficient Products; WARMAdvantage and COOLAdvantage
Residential Existing Homes	\$91.0	None	Home Performance with Energy Star
Residential Behavioral	\$48.8	Data Analytics Pilot	None
Residential K- 12 Education	\$6.7	None	None
Residential New Construction	\$29.1	None	Energy Star Homes; Energy Star Zero Energy Homes
Residential Multi-Family	\$18.1	None	Comfort Partners (for low-income customers); Home Performance with Energy Star
Residential Income Eligible	\$111.1	Multifamily Housing	Comfort Partners

**Q. PLEASE BRIEFLY EXPLAIN THE PROPOSED RESIDENTIAL  
SUBPROGRAMS IDENTIFIED IN TABLE 1 AND THEIR RELATIONSHIPS TO  
EXISTING PSE&G AND NJCEP PROGRAMS.**

A. The subprograms are as follows:

1       **Residential Efficient Products:** PSE&G proposes this subprogram to “promote the  
2       installation of ENERGY STAR and other high-efficiency electric and natural gas  
3       equipment by residential customers” including “energy efficient lighting, appliances,  
4       smart thermostats, electronics, and heating and cooling equipment.”<sup>9</sup> PSE&G  
5       currently offers a Smart Thermostats program with a stipulated budget of \$6.5 million  
6       over two years. The NJCEP provides rebates to PSE&G customers for efficient  
7       appliances and other products, including its refrigerator and freezer recycling  
8       program and its residential HVAC (COOLAdvantage and WARMAdvantage)  
9       programs. PSE&G proposes to displace the NJCEP and expand its online marketplace  
10      to incorporate the additional energy efficient products. It would also develop other  
11      delivery channels as described in Schedule KR-CEF-EE-2, pages 8-9, to provide  
12      incentives and facilitate the purchase of high-efficiency products.

- 13      • **Residential Existing Homes:** Under this proposed subprogram, participants would  
14      “undergo an energy audit and receive free installation of low-cost direct install energy  
15      efficiency measures, as well as an energy efficiency action-plan that includes  
16      recommendations for potential upgrades and available incentives.”<sup>10</sup> With respect to  
17      currently available similar programs, “[t]he NJCEP currently offers a similar program in  
18      its Home Performance with Energy Star Program (“HPwES”), and it is anticipated that  
19      PSE&G customers will participate in PSE&G’s subprogram.”<sup>11</sup> PSE&G does not  
20      currently offer a similar program.
- 21      • **Residential Behavioral:** This is a proposed expansion of an existing PSE&G pilot  
22      “Residential Data Analytics” program that would provide home energy reports and an on-  
23      line energy information portal to customers. The EE 2017 pilot subprogram had a  
24      stipulated two-year budget of \$2.5 million. There is no similar program offered under the  
25      NJCEP.

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<sup>9</sup> Schedule KR-CEF-EE-2, pages 7-8.

<sup>10</sup> Schedule KR-CEF-EE-2, page 13.

<sup>11</sup> Schedule KR-CEF-EE-2, page 15.

- 1       • **Residential K- 12 Education:** This is a proposed new subprogram to offer “targeted  
2       classroom energy efficiency and awareness education and take-home energy efficiency  
3       kits, as well as engage with students and school facility managers to highlight and  
4       identify recently completed efficiency upgrades and remaining opportunities.”<sup>12</sup> PSE&G  
5       has not identified any similar program currently available in its service territory, nor is  
6       there a similar program under the NJCEP.
- 7       • **Residential New Construction:** This is a proposed new program for PSE&G that is  
8       designed to “significantly improve the energy efficiency of newly constructed single-  
9       family and single-family attached homes in the PSE&G service territory” by educating  
10      and providing incentives to builders to use high-efficiency materials and practices.<sup>13</sup> The  
11      proposed program would displace the existing NJCEP ENERGY STAR home and  
12      ENERGY STAR zero energy homes incentives to PSE&G customers.
- 13      • **Residential Multi-Family:** This program is designed to provide direct installation of  
14      measures such as LED lighting, low-flow showerheads and faucet aerators, and smart  
15      power strips, along with information packets, to property owners, property managers, and  
16      the residents of multi-family facilities.<sup>14</sup> PSE&G currently offers a Multifamily Housing  
17      subprogram with a stipulated budget of \$20 million over two years. The Company states  
18      that its existing subprogram “may include direct installation of energy efficiency  
19      measures in tenant spaces, but only as part of a broader and more comprehensive  
20      approach.” Some elements of the newly proposed Multifamily subprogram would replace  
21      services previously available through the NJCEP Home Performance with Energy Star  
22      program.
- 23      • **Residential Income Eligible:** This proposed subprogram would provide “free direct  
24      installation of energy efficient technologies and weatherization services to qualifying

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<sup>12</sup> Schedule KR-CEF-EE-2, page 20.

<sup>13</sup> Schedule KR-CEF-EE-2, page 23.

<sup>14</sup> Schedule KR-CEF-EE-2, pages 26-27.

1 PSE&G customers with limited income.”<sup>15</sup> PSE&G’s existing Multifamily Housing  
2 subprogram is targeted at many of the same income-eligible customers proposed to be  
3 addressed by this program. Its current proposal would be an expansion of its existing  
4 program and does not appear to require a transition away from or termination of OCE  
5 program administration.

6 **Q. DO YOU RECOMMEND THAT THE BOARD ALLOW PSE&G TO DISPLACE**  
7 **THE NJCEP RESIDENTIAL PROGRAMS IN ITS SERVICE TERRITORY AS**  
8 **DESCRIBED ABOVE?**

9 A. No. The NJCEP residential programs listed in Table 1 are well-established and cost-  
10 effective, and should remain available to residential customers in PSE&G’s service  
11 territory. As discussed further below, I also find that the Company’s proffered CBAs and  
12 transition plan do not support its proposed reorganization of regulated energy efficiency  
13 services in its service territory. If the Board determines that PSE&G should provide EE  
14 programs on an interim basis pending the resolution of the preliminary analyses and  
15 processes set forth by the CEA, I recommend that the Company be directed to extend its  
16 current Residential EE programs for this interim period.

17 b. Proposed Commercial and Industrial Subprograms

18 **Q. WHAT ARE THE SPECIFIC COMERCIAL AND INDUSTRIAL (“C&I”)**  
19 **SUBPROGRAMS IN THE COMPANY’S PROPOSAL AS FILED, AND HOW DO**  
20 **THEY COMPARE TO THE SUBPROGRAMS INCLUDED IN THE**  
21 **COMPANY’S EE 2017 PROGRAM?**

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<sup>15</sup> Schedule KR-CEF-EE-2, page 30.

A. Table 2 lists each of the proposed C&I subprograms, along with identification of related subprograms from the Company's current EE 2017 program, as well as NJCEP offerings, as described in PSE&G Schedule KR-CEF-EE-1.

**TABLE 2. PROPOSED COMMERCIAL AND INDUSTRIAL SUBPROGRAMS VS. EXISTING OFFERINGS**

<b>Proposed Subprogram</b>	<b>Proposed Budget (\$million)</b>	<b>PSE&amp;G EE 2017</b>	<b>Related NJCEP/BPU Program(s)</b>
C&I Prescriptive	\$617.5	None	New Construction and Retrofit (SmartStart);
C&I Custom	\$249.6	Hospital	SmartStart Buildings; Pay for Performance
C&I Small Non-Residential Efficiency	\$349.9	Direct Install	Direct Install
C&I New Construction	\$26.7	None	New Construction and Retrofit (SmartStart); Pay for Performance
C&I Energy Management	\$14.1	None	Pay for Performance; Energy Savings Improvement Program (ESIP)
C&I Engineered Solutions	\$359.1	Hospital; Multifamily	ESIP
C&I Streetlight	\$152.0	None	None

**Q. PLEASE BRIEFLY EXPLAIN THE PROPOSED C&I SUBPROGRAMS IDENTIFIED IN TABLE 2 AND THEIR RELATIONSHIPS TO EXISTING PSE&G AND NJCEP PROGRAMS.**

A. The subprograms are as follows:

- **C&I Prescriptive:** This proposed new subprogram is designed to provide incentives, information, and technical assistance to all nonresidential electric and gas customers to

1 promote the installation of high-efficiency equipment.<sup>16</sup> The proposed subprogram would  
2 displace aspects of the NJCEP New Construction and Retrofit (SmartStart) Program.

- 3 • **C&I Custom:** This proposed subprogram “will offer incentives for electric and natural  
4 gas efficiency opportunities for commercial, industrial, and other non-residential  
5 customers that are nonstandard and not captured by the C&I Prescriptive Subprogram, or  
6 any other proposed custom subprogram offering including the C&I Engineered Solutions  
7 Subprogram.”<sup>17</sup> PSE&G currently offers such services only to hospitals under its EE  
8 2017 Hospital Efficiency Subprogram, which has a stipulated two-year budget of \$25  
9 million. The proposed subprogram would displace elements of the NJCEP custom  
10 efficiency rebate program under SmartStart, as well as of the NJCEP Pay for  
11 Performance incentive program, for customers in the PSE&G service territory.
- 12 • **C&I Small Non-Residential Efficiency:** This subprogram is designed to facilitate the  
13 installation of high-efficiency equipment for small C&I customers that otherwise would  
14 face knowledge, time, and financing barriers.<sup>18</sup> The subprogram would be an expansion  
15 of PSE&G’s current Direct Install program which has a stipulated two-year budget of \$15  
16 million. It would also displace the NJCEP Direct Install program.
- 17 • **C&I New Construction:** This proposed program is intended to capture efficiency  
18 opportunities for C&I structures that are only available during the design and  
19 construction phase.<sup>19</sup> It is a proposed new subprogram, that would displace elements of  
20 the NJCEP SmartStart and Pay for Performance programs.
- 21 • **C&I Energy Management:** This proposed subprogram would be comprised of two  
22 initiatives, Retro-commissioning and Strategic Energy Management, that are “designed to  
23 optimize energy consumption in existing C&I buildings through management of major  
24 energy using systems, user behavior, and low-cost, easy-to-install efficiency measures at

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<sup>16</sup> Schedule KR-CEF-EE-2, page 34.

<sup>17</sup> Schedule KR-CEF-EE-2, page 38.

<sup>18</sup> Schedule KR-CEF-EE-2, page 42.

<sup>19</sup> Schedule KR-CEF-EE-2, page 46.



1 the time of an initial site visit or a follow-up.”<sup>20</sup> This proposed new subprogram would  
2 displace elements of the NJCEP SmartStart program.

- 3 • **C&I Engineered Solutions:** This proposed subprogram, geared towards public  
4 buildings, universities, hospitals, and nonprofits, is designed to “provide expert-guided  
5 service throughout delivery to assist customers in identifying and undertaking large  
6 energy efficiency projects on-site, while requiring no upfront funding from the  
7 customer.”<sup>21</sup> It includes an audit of the facility and assessment of energy-saving  
8 opportunities, and incentives that would be determined on a case-by-case basis. PSE&G  
9 proposes to include a Combined Heat and Power component of this subprogram. This  
10 proposed subprogram would expand upon elements of PSE&G’s current Hospital  
11 Efficiency and Multifamily Residential subprograms. Although there is no NJCEP  
12 program that currently offers a similar service, PSE&G states that “[w]ith respect to  
13 public school districts this subprogram may operate in a complementary manner with the  
14 existing NJ ESIP financing mechanism, while also providing an optional, alternative  
15 financing mechanism.”<sup>22</sup>
- 16 • **C&I Streetlight:** This proposed new subprogram is “designed to upgrade all existing  
17 high-pressure sodium (HPS) cobra head streetlight luminaires to light emitting diode  
18 (LED) streetlight technologies of equivalent luminance in PSE&G electric service  
19 territory.”<sup>23</sup> The projected costs include recovery of stranded costs for existing streetlight  
20 infrastructure that would be retired early, and the savings include avoidance of future  
21 equipment replacements that would be deferred. PSE&G proposes to include within this  
22 subprogram what the Company describes as “an additional pilot component...that will  
23 encourage the adoption of a “smart cities” concept, which will be offered to a limited  
24 number of municipalities that wish to enhance their services beyond LED lighting  
25 upgrades.” According to the Company, “The enhanced services could include the

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<sup>20</sup> Schedule KR-CEF-EE-2, page 51.

<sup>21</sup> Schedule KR-CEF-EE-2, page 56.

<sup>22</sup> Schedule KR-CEF-EE-2, page 58.

<sup>23</sup> Schedule KR-CEF-EE-2, page 60.

1 addition of environmental sensors for monitoring air quality, temperature and humidity,  
2 local parking and traffic sensors to direct drivers to less congested areas, LED lighting  
3 banners for more efficient lighting use, and a communications backbone with sensors  
4 mounted on utility poles that allows the local government to deploy Internet of Things  
5 (“IoT”) to support public safety and public Wi-Fi networks.” This pilot subprogram does  
6 not seem to be geared toward energy savings or peak reduction in general, and does not  
7 replace any existing EE program. Further, the Company appears to be proposing to  
8 extend accelerated EE recovery to what are essentially EDC rate base infrastructure  
9 items.

10 **Q. DO YOU RECOMMEND THAT THE BOARD ALLOW PSE&G TO DISPLACE**  
11 **THE NJCEP C&I PROGRAMS IN ITS SERVICE TERRITORY AS DESCRIBED**  
12 **ABOVE?**

13 A. No. The NJCEP C&I programs listed in Table 2 are well-established and cost-effective,  
14 and should remain available to C&I customers in PSE&G’s service territory. As  
15 discussed below, I also find that the Company’s proffered CBAs do not support its  
16 proposed reorganization of regulated energy efficiency services in its service territory. If  
17 the Board determines that PSE&G should provide C&I EE programs on an interim basis  
18 pending the resolution of the preliminary analyses and processes set forth by the CEA, I  
19 recommend that the Company be directed to extend its current C&I EE programs for this  
20 interim period.

c. Proposed Pilot Subprograms

**Q. WHAT ARE THE SPECIFIC PILOT SUBPROGRAMS IN THE COMPANY'S PROPOSAL AS FILED, AND HOW DO THEY COMPARE TO THE SUBPROGRAMS INCLUDED IN THE COMPANY'S EE 2017 PROGRAM?**

A. Table 3 lists each of the proposed Pilot subprograms, along with identification of related subprograms from the Company's current EE 2017 program, as well as NJCEP offerings, as described in PSE&G Schedule KR-CEF-EE-1.

**TABLE 3. PROPOSED PILOT SUBPROGRAMS VS. EXISTING OFFERINGS**

<b>Proposed Pilot Subprogram</b>	<b>Proposed Budget (\$million)</b>	<b>PSE&amp;G EE 2017</b>	<b>Related NJCEP/BPU Program(s)</b>
Emerging Technologies & Approaches	\$26.3	None	None
Energy Efficiency as a Service Pilot	\$26.3	None	None
Smart Homes Pilot	\$26.3	None	Promotion and awareness of EE products and behaviors
Non-Wires Alternative Pilot	\$26.3	None	None
Non-Pipes Solution Pilot	\$26.3	None	None
Volt Var Pilot	\$16.3	None	None
Business Energy Reports Pilot	\$12.1	None	None
Building Operator Certification Pilot	\$9.6	None	None

**Q. PLEASE BRIEFLY EXPLAIN THE PROPOSED PILOT SUBPROGRAMS IDENTIFIED IN TABLE 3, AND ANY RELATIONSHIPS TO EXISTING PSE&G AND NJCEP PROGRAMS.**

A. The proposed pilot subprograms are as follows:

- 1       • **Emerging Technologies and Approaches:** This proposed pilot subprogram is designed  
2       to “evaluate, demonstrate, and deploy the next generation of technologies and customer  
3       engagement approaches, promote economic development in New Jersey, and coordinate  
4       ETA Pilot activity and lessons learned with all utilities in New Jersey.”<sup>24</sup> There is no  
5       similar program offered under the NJCEP nor have any such programs been approved for  
6       other utilities.
- 7       • **Energy Efficiency as a Service Pilot:** This proposed pilot subprogram is designed to  
8       “offer C&I customers a deeper, ongoing relationship with PSE&G through service  
9       contracts, incentives, and extensive guidance on executing service contracts for  
10      intelligent building equipment and software...[a] key element of [this pilot subprogram]  
11      is the use of service contracts with vendors through which customers pay a monthly fee  
12      for energy service, which enables them to avoid performance risk and up-front cost  
13      exposure.”<sup>25</sup> There is no similar program offered under the NJCEP; however, similar  
14      services are or can be provided by the private sector in many areas.
- 15      • **Smart Homes Pilot:** According to PSE&G, “[t]he purpose of this pilot is to allow  
16      PSE&G to diverge from typical energy efficiency subprogram implementations and test  
17      new and innovative smart home concepts with customers and the emerging network of  
18      private sector firms active in this broad space.”<sup>26</sup> The measures would use connected  
19      devices and software to “introduce more automated and personalized savings measures  
20      that go beyond utilizing individual connected devices, to using an ecosystem of devices  
21      in conjunction.”<sup>27</sup> There is no similar program offered under the NJCEP; however, such  
22      services may be provided by private sector entities.
- 23      • **Non-Wires Alternative (“NWA”) Pilot:** The goal of this proposed pilot subprogram is  
24      to determine whether “certain targeted initiatives that use demand side solutions can cost-

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<sup>24</sup> Schedule KR-CEF-EE-2, page 64.

<sup>25</sup> Schedule KR-CEF-EE-2, page 70.

<sup>26</sup> Schedule KR-CEF-EE-2, page 74.

<sup>27</sup> Ibid.

1 effectively defer or replace the need for and investment in new electric infrastructure and  
2 equipment upgrades, such as distribution lines or transformers, by reducing the electric  
3 load at a substation or circuit level.”<sup>28</sup> There is no similar program offered under the  
4 NJCEP nor, as far as I know, is any such program implemented by any New Jersey  
5 electric utility as part of its suite of EE programs.

- 6 • **Non-Pipes Solutions (“NPS”) Pilot:** The goal of this proposed pilot subprogram is to  
7 determine whether “certain targeted initiatives that use demand side solutions to reduce  
8 gas load at the localized level during peak periods, can cost-effectively defer or replace  
9 new gas infrastructure construction.”<sup>29</sup> There is no similar program offered under the  
10 NJCEP nor, as far as I know, is any such program implemented by any New Jersey gas  
11 utility as part of its suite of EE programs.

- 12 • **Volt Var Pilot:** Also called the Voltage and Reactive Power Optimization Pilot, this pilot  
13 program is designed to test the capability of smart-grid technology to reduce consumption  
14 and lower peak demand and losses by using “distributed sensors, two-way  
15 communications infrastructure, remote controls on substation transformer load-tap  
16 changers and capacitor banks and integrating/optimizing software algorithms to flatten  
17 voltage profiles and lower the average voltage levels delivered to customers.”<sup>30</sup> There are  
18 no existing similar NJCEP or PSE&G programs.

- 19 • **Business Energy Report Pilot:** This pilot subprogram would provide information on  
20 energy use and savings opportunities to building owners and facilities managers.<sup>31</sup> There  
21 are no existing similar NJCEP or PSE&G programs.

- 22 • **Building Operator Certification Pilot:** This pilot subprogram would offer training and  
23 certification to building operators for day-to-day operations and control setting in ways

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<sup>28</sup> Schedule KR-CEF-EE-2, page 78.

<sup>29</sup> Schedule KR-CEF-EE-2, page 82.

<sup>30</sup> Schedule KR-CEF-EE-2, page 86.

<sup>31</sup> Schedule KR-CEF-EE-2, page 89.

1 that reduce energy usage.<sup>32</sup> There is no similar program offered under the NJCEP;  
2 however, such services may be provided by private sector entities.

3 **Q. DO YOU RECOMMEND THAT THE BOARD APPROVE PSE&G'S PROPOSED**  
4 **PILOT SUBPROGRAMS, WHICH WOULD NOT DISPLACE EXISTING NJCEP**  
5 **PROGRAMS?**

6 A. No. PSE&G's proposal, including its proposed pilot subprograms, is premature and  
7 should not be approved in the absence of clear direction from the Board, including energy  
8 efficiency targets and QPIs.

9 **Q. IN ADDITION TO OFFERING MANY MORE PROGRAMS THAN IT HAS IN**  
10 **THE PAST, CAN YOU QUANTIFY THE INCREASE IN SCALE PSE&G IS**  
11 **PROPOSING FOR ITS ENERGY EFFICIENCY PROGRAMS?**

12 A. Yes. PSE&G is proposing a six-year, \$2.78 billion program to serve its electric and gas  
13 customers, or an average of \$463.8 million per year. Its previously approved program,  
14 known as EE-2017, was established through stipulation as a two-year program with a  
15 budget of \$85.1 million, or an average of \$42.55 million per year. Thus the Company is  
16 proposing to increase its average annual expenditures on energy efficiency by a factor of  
17 almost 11.

18 d. Overall Proposal

19 **Q. IS IT APPROPRIATE TO INCREASE SPENDING ON ENERGY EFFICIENCY**  
20 **GIVEN BOTH THE CLEAN ENERGY ACT AND THE AVAILABILITY OF**  
21 **UNEXPLOITED, COST-EFFECTIVE POTENTIAL?**

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<sup>32</sup> Schedule KR-CEF-EE-2, pages 92-93.

1     A.     Yes, subject to the ongoing energy efficiency potential studies and establishment of  
2           targets and QPIs pursuant to the CEA. The CEA provides a roadmap for both assessing  
3           the potential for gas and electric energy efficiency and peak load reduction, and for  
4           utilities such as PSE&G to work collaboratively with the Board, OCE, Rate Counsel, and  
5           other stakeholders to achieve much higher levels of cost-effective savings. It does not  
6           support utilities ignoring that roadmap, and deciding for themselves, without consultation  
7           with other parties, what the roles of various entities in the state should be.

8     **Q.     WHAT ARE YOUR OVERALL CONCLUSIONS ABOUT PSE&G’S PLAN FOR**  
9           **OFFERING ITS PROPOSED ENERGY EFFICIENCY PROGRAMS IN PLACE**  
10          **OF THOSE PROFFERED UNDER THE NJCEP?**

11    A.     In its very brief “CEF-EE Program Transition Plan”,<sup>33</sup> PSE&G states that it “recognizes  
12           the role currently played by the [OCE] and the [CEP] in delivering existing programs to  
13           customers”; that “PSE&G will look to the OCE to assure that these items conform to the  
14           State’s energy policy, are consistent with the OCE’s ongoing operations, and incorporate  
15           input based upon recent experience”; and that “[c]ustomers benefit most when PSE&G  
16           and the OCE are working hand-in-hand, with clearly defined program guidelines.”  
17           However, it does not seem that PSE&G relied on the expertise of OCE staff in the  
18           development of its plan for overhauling the roles of the OCE and the utility in the  
19           provision of energy efficiency services to PSE&G customers. Nor did it wait for guidance  
20           from the Board on its role and responsibilities in this area under the CEA. My conclusion

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<sup>33</sup> Supplemental Direct Testimony of Karen Reif, Exhibit 1.

1 is that the plan is poorly defined and premature, and suffers from lack of collaboration  
2 with other stakeholders.

3 **Q. GIVEN THAT OCE HAS SIGNIFICANT EXPERIENCE WITH MANY OF THE**  
4 **TYPES OF PROGRAMS PSE&G IS PROPOSING, WHAT IS PSE&G'S**  
5 **RATIONALE FOR WHY IT SHOULD BECOME THE "EXCLUSIVE**  
6 **PROVIDER OF REGULATED ENERGY EFFICIENCY PROGRAMS THAT**  
7 **ARE OFFERED IN THE COMPANY'S SERVICE TERRITORY"?**

8 A. As I read it, the Company has three basic arguments for why it should assume this role. I  
9 would like to address these arguments one at a time.

10 **Q. WHAT IS THE FIRST ARGUMENT GIVEN BY THE COMPANY?**

11 A. The Company notes that the Clean Energy Act requires a significant increase in the  
12 requirements for energy savings by utilities, and may impose penalties for failing to do  
13 so. As noted in the Company's Petition:

14 ...following a transition period, the establishment of PSE&G as the exclusive  
15 provider of regulated energy efficiency programs that are offered in the  
16 Company's service territory is a prerequisite to implementing the CEF-EE  
17 Program and satisfying the mandatory usage reduction targets imposed on  
18 utilities in the Clean Energy Law. Utilities should not on one hand be required  
19 to meet these reduction targets, with penalties if they do not achieve them, and  
20 on the other hand be faced with competition in satisfying them from other  
21 regulated programs.<sup>34</sup>

22 This paragraph suggests that the Company believes it will be held to a high standard for  
23 meeting energy efficiency targets through regulated programs, but that if third parties are

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<sup>34</sup> Petition, ¶27



involved, the Company may not be able to take “credit” for all of the savings in its service territory, and thus it could be more difficult to meet the targets.

**Q. IS THIS CONCERN JUSTIFIED?**

A. No. The Board has not yet addressed the relevant issues or clarified the utilities’ responsibilities in meeting the requirements of the CEA. The CEA states that the Board “shall require each electric public utility and gas public utility to reduce” the usage of energy in its territory “below what would otherwise have been used.” Further, the CEA sets specific requirements for annual reductions that each electric and gas public utility “shall be required to achieve.”<sup>35</sup> However, the CEA requires the Board to establish quantitative performance indicators (“QPI”),<sup>36</sup> and such QPIs “shall establish reasonably achievable targets” for energy savings that “take into account the public utility’s energy efficiency measures and other non-utility energy efficiency measures including measures to support the development and implementation of building code changes, appliance efficiency standards, the Clean Energy program, any other State-sponsored energy efficiency or peak reduction programs, and public utility energy efficiency programs that exist on the date of enactment of P.L.2018, c.17 (C.483-87.8 et al.)”<sup>37</sup>

Finally, the CEA directs each gas and electric public utility to “file an annual petition with the Board to demonstrate compliance” with its efficiency targets. If the utility “achieves the performance targets established in the quantitative performance indicators, the public utility shall receive an incentive;” if it fails, “the public utility shall be assessed

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<sup>35</sup> N.J.S.A. 48:3-87.9(3)(a).

<sup>36</sup> N.J.S.A. 48:3-87.9(3)(a).

<sup>37</sup> N.J.S.A. 48:3-87.9(3)(c) [emphasis added].

1 a penalty.”<sup>38</sup> The plain reading of the CEA is that the incentives and penalties under the  
2 act are associated with the QPIs, to be established by the Board, and that the QPIs take  
3 into account non-utility energy efficiency programs and measures. The Board has yet to  
4 establish QPIs, nor has the Board set associated incentives or penalties for nonattainment.

5 **Q. DOES THIS JUSTIFY THE COMPANY’S PROPOSAL TO BECOME THE**  
6 **EXCLUSIVE PROVIDER OF REGULATED EFFICIENCY SERVICES IN ITS**  
7 **TERRITORY?**

8 A. No. It suggests that the Company is premature in trying to impose its own interpretation  
9 of the CEA’s language before the Board can provide required guidance. Further, this  
10 interpretation discounts the longstanding and effective role of the OCE’s programs,  
11 despite the fact that the CEA specifically references “measures to support...the Clean  
12 Energy Program” as included in the QPIs. PSE&G cannot reasonably conclude that it  
13 alone must achieve the savings targets established pursuant to the CEA. PSE&G can and  
14 should await Board guidance on its specific responsibilities and targets before proposing  
15 to overhaul the structure of energy efficiency services in its territory pursuant to its own  
16 interpretation of the CEA.

17 **Q. WHAT IS THE SECOND ARGUMENT MADE BY THE COMPANY IN**  
18 **SUPPORT OF ITS PROPOSAL TO BECOME THE EXCLUSIVE PROVIDER OF**  
19 **REGULATED EE SERVICES IN ITS TERRITORY?**

20 A. The Company argues that it is uniquely positioned to provide these services. To illustrate  
21 it cites “PSE&G’s exceptional capacity to transform the market” and that, as the utility, it

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<sup>38</sup> N.J.S.A. 48:3-87.9(3)(e).

1 can provide “on-bill repayment, which will let customers reduce the up-front cost burden  
2 often associated with EE investments by paying off these investments over an extended  
3 period of time in a way that is accessible and logical, and packages energy and energy  
4 services into a single bill.” (Supplemental testimony of Karen Reif, Exhibit 1, page 1.)

5 **Q. DO YOU AGREE THAT AS THE LOCAL UTILITY, PSE&G IS UNIQUELY**  
6 **POSITIONED TO PROVIDE ON-BILL REPAYMENT TO ITS CUSTOMERS?**

7 A. Yes, due to its chartered position as the monopoly provider of regulated electric  
8 distribution service for customers in its region. I would also note that certain larger C&I  
9 customers do not take default energy supply and purchase through third-party suppliers,  
10 who could also offer this service if it is attractive to customers. Residential customers  
11 may also choose a third party supplier, who might also offer financing options.

12 **Q. DOES THIS POSITION JUSTIFY THE COMPANY’S PROPOSAL TO BECOME**  
13 **THE EXCLUSIVE PROVIDER OF REGULATED EFFICIENCY SERVICES IN**  
14 **ITS TERRITORY?**

15 A. No. Numerous other utilities in New Jersey provide zero- or low-interest loans to  
16 customers with on-bill repayment in support of energy efficiency programs without being  
17 the exclusive provider of such services in their service territory. In fact, this is one of the  
18 primary and longstanding ways that utilities have coordinated their energy efficiency  
19 offerings with the OCE – by providing loans to mitigate the remaining up-front cost of  
20 energy efficiency measures for which customers receive OCE rebates. On-bill financing  
21 is an effective tool that PSE&G and third-party suppliers can use to promote customer  
22 uptake of existing programs, even if it is not the sole sponsor of those programs.

1    **Q.     WHAT IS THE THIRD ARGUMENT MADE BY THE COMPANY IN SUPPORT**  
2           **OF ITS PROPOSAL TO BECOME THE EXCLUSIVE PROVIDER OF**  
3           **REGULATED EE SERVICES IN ITS TERRITORY?**

4    A.    PSE&G witness Karen Reif makes a number of statements throughout her testimony and  
5           exhibits about the Company's unique role because of its relationship with its customers.  
6           For example, Ms. Reif cites "the strategic positioning of its business customer  
7           representatives to promote a suite of EE incentives, for existing customers as well as --  
8           and especially during -- requests for an extension or upgrade of utility service at the front  
9           end of construction... PSE&G's ability to effectively drive EE and technology  
10          investments flowing from the fact that it is already the main point-of-customer contact  
11          and already has representatives on-site cannot be overstated."<sup>39</sup>

12   **Q.     DOES THIS JUSTIFY THE COMPANY'S PROPOSAL TO BECOME THE**  
13           **EXCLUSIVE PROVIDER OF REGULATED EFFICIENCY SERVICES IN ITS**  
14           **TERRITORY?**

15   A.    No. As a regulated utility, the Company can and should leverage its unique relationship  
16           with customers, and its knowledge of requests for extensions and upgrades of utility  
17           services, to promote energy efficiency programs regardless of what entity sponsors the  
18           program. Further, this "strategic positioning" is an important reason that the company is  
19           generally not allowed to wade into areas where it would compete with private sector  
20           entities as part of its regulated services. The Company's responsibility to provide least-  
21           cost and best-quality service to its customers, including energy efficiency services, is

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<sup>39</sup> Supplemental Direct Testimony of Karen Reif, Exhibit 1, page 1.

1 based on its obligation to serve as a monopoly utility - and should not be predicated on  
2 maximizing use of its own regulated programs. I also note that third party suppliers may  
3 also have detailed knowledge about their customers' energy profiles and business needs,  
4 and may also offer EE services accordingly.

5 **Q. DO YOU RECOMMEND THAT THE BOARD DESIGNATE PSE&G AS THE**  
6 **EXCLUSIVE PROVIDER OF REGULATED EE SERVICES IN ITS**  
7 **TERRITORY? WHY OR WHY NOT?**

8 A. No, I do not recommend such an action at this time. I find that the Company has failed to  
9 demonstrate that it can more efficiently or effectively deliver energy efficiency services  
10 as the exclusive provider in its territory, because each of its arguments fails to establish  
11 such a need. I further find that the Company has much less experience and track record of  
12 delivering a broad range of energy efficiency programs than the OCE, making it highly  
13 improbable that it can effectively take full control over such programs at this time.  
14 Further, I find that the Company's proposal is premature, as it attempts to usurp the  
15 Board's authority to establish energy saving and peak reduction goals and determination  
16 of QPIs by imposing its own interpretation of the issue before the Board has had an  
17 opportunity to do so. Finally, the Company has no substantive proposal for reducing  
18 and/or reallocating the Societal Benefits Charge ("SBC") funding that is currently  
19 collected from customers to support the OCE programs. This could place PSE&G's  
20 customers in the position of having to pay twice for essentially the same energy  
21 efficiency programs.

1   **Q.    YOU RECOMMENDED ABOVE THAT THE COMPANY BE DIRECTED TO**  
2       **EXTEND ITS CURRENT C&I EE PROGRAMS FOR THIS INTERIM PERIOD.**  
3       **IS THERE A PRECEDENT FOR APPROVING A UTILITY’S EE PROGRAMS**  
4       **FOR A SHORTER DURATION THAN REQUESTED IN ITS FILING?**

5    A.   Yes. For example, South Jersey Gas’ “EEP IV” program was proposed for a duration of  
6       five years, but was approved following a stipulation for a three-year program with a  
7       reassessment after the second year.<sup>40</sup> Similarly, New Jersey Natural Gas proposed its  
8       most recent SAVEGREEN 2018 program for a period of six years, but ultimately was  
9       granted approval following a stipulation for a three-year program with a reassessment  
10      after the second year.<sup>41</sup> As a final example, Pivotal Utility Holdings (also called  
11      Elizabethtown Gas) filed for a four-year extension of its programs but was approved  
12      following stipulation for an extension period of 18 months.<sup>42</sup>

13   **IV.   Cost-Benefit Analyses**

14   **Q.    DID PSE&G SUBMIT A COST-BENEFIT ANALYSIS OF ITS PROPOSED**  
15       **PROGRAMS WITH ITS FILING IN THIS MATTER?**

16   A.   Yes, as required under the Board’s Minimum Filing Requirements (“MFR”).<sup>43</sup> A  
17       summary of the CBA was provided in Section six of Schedule KR-CEF-EE-2. The  
18       Company also submitted workpapers in support of its CBA that was prepared by its  
19       consultant, Gabel and Associates, as Ms. Reif’s workpaper “WP-KR-CEF-EE-1 - PSEG

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<sup>40</sup> BPU Docket No. GO18030350.

<sup>41</sup> BPU Docket No. GO18030355.

<sup>42</sup> BPU Docket No. GO16070618.

<sup>43</sup> BPU Docket No. QO17091004.

1 Program Model.xlsx”. An updated version was provided as “WP-KR-CEF-EE-1-R1 -  
2 CONFIDENTIAL.xlsx”.

3 **Q. WHAT COST EFFECTIVENESS TESTS WERE PRESENTED BY PSE&G IN**  
4 **SUPPORT OF ITS PROGRAMS?**

5 A. Ms. Reif provided results and supporting analyses for the Societal Cost Test (“SCT”), the  
6 Total Resource Cost (“TRC”) test, the Participant Cost Test (“PCT”), the Program  
7 Administrator Cost (“PAC”) test, and the Ratepayer Impact Measure (“RIM”) test. These  
8 are five industry-standard tests that are widely used throughout the United States to test  
9 cost-effectiveness of energy efficiency programs from a variety of perspectives, as will  
10 be described below. Practitioners generally rely on a common reference known as the  
11 California Standard Practice Manual (“CSPM”)<sup>44</sup> for standard definitions of these tests.

12 **Q. DID PSE&G AND/OR ITS CONSULTANT GABEL ASSOCIATES APPLY**  
13 **THESE STANDARD COST EFFECTIVENESS TESTS CORRECTLY?**

14 A. Based on my analysis, only the TRC was applied in a reasonable manner. The TRC is  
15 designed to compare all monetized costs and benefits of a program, without consideration  
16 of what entity pays or receives the benefits. According the CSPM, “The Total Resource  
17 Cost Test measures the net costs of a demand-side management program as a resource  
18 option based on the total costs of the program, including both the participants' and the  
19 utility's costs.”<sup>45</sup> This means that the “cost” side of this test includes all administrative  
20 and implementation costs of an EE measure, regardless of who pays. It does not consider

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<sup>44</sup> <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=7741>.

<sup>45</sup> CSPM, page 18.

1 transfer payments among the parties, such as rebates, loans, or loan repayments, because  
2 these are financial transactions (sometimes called “transfer payments”) that are  
3 independent of the actual cost of implementing the measure.

4 On the benefit side, the TRC counts all avoided costs for the utility valued at marginal  
5 cost, such as avoided energy, capacity, transmission and distribution, and ancillary  
6 service costs, that would have been incurred by the utility but for the EE measure. In the  
7 Company’s case, these additional benefits included reduced wholesale volatility and for  
8 so-called “Merit Order” or “DRIPE”<sup>46</sup> benefits, both of which are unconventional TRC  
9 considerations and difficult to quantify. However, based on my review, the results  
10 presented for the TRC reasonably represent the projected cost effectiveness of the  
11 proposed programs from a Total Resource Cost perspective

12 **. Q. PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE SOCIETAL COST**  
13 **TEST.**

14 A. The Societal Cost Test is designed to represent costs and benefits associated with a given  
15 program from the perspective of society as a whole; unlike the TRC test, it is designed to  
16 include costs and benefits that are not directly monetized, such as the social (health and  
17 environmental) benefits of avoided pollutant emissions. According the CSPM, “The  
18 Societal Test differs from the TRC test in that it includes the effects of externalities (e.g.,  
19 environmental, national security), excludes tax credit benefits, and uses a different

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<sup>46</sup> DRIPE is an acronym for Demand Reduction Induced Price Effect. See [https://www4.eere.energy.gov/seeaction/system/files/documents/DRIPE-finalv3\\_0.pdf](https://www4.eere.energy.gov/seeaction/system/files/documents/DRIPE-finalv3_0.pdf) for a discussion.



1 (societal) discount rate.”<sup>47</sup> The Company justifies reliance on the SCT because the CEA  
2 states that “The energy efficiency programs and peak demand reduction programs  
3 [required by the Clean Energy Act] shall have a benefit-to-cost ratio greater than or equal  
4 to 1.0 at the portfolio level, considering both economic and environmental factors.”<sup>48</sup>  
5 However, it is important to note that a very significant factor differentiating the SCT  
6 from the TRC, at least as the Company has applied it, is that PSE&G has applied a very  
7 low (“societal”) discount rate of 2.77% for the SCT to account for the time value of  
8 money, versus the utility discount rate of 6.8% that it applied for the TRC and all other  
9 tests. This discrepancy alone produces much higher calculated benefit-to-cost ratios,  
10 because most of the costs of the Company’s programs occur at the beginning, while the  
11 benefits occur over a projected measure life of 10 to 20 years. There is nothing in the  
12 CEA that directs utilities to use a “societal” discount rate when performing cost-benefit  
13 analyses.

14 **Q. ARE YOU ADDRESSING THE COMPANY’S ERRORS IN THE**  
15 **CALCULATION OF THE SOCIETAL COST TEST?**

16 A. No. The Company’s errors in performing the SCT test are addressed in detail in the direct  
17 testimony of Rate Counsel witness David Dismukes.

18 **Q. PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE PARTICIPANT**  
19 **COST TEST.**

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<sup>47</sup> CSPM, page 18.

<sup>48</sup> N.J.S.A. 48:3-87.9(d)(2), as cited in data response RCR-EE-0020. Emphasis added.

1 A. The Participant Cost Test considers cost-effectiveness solely considering the costs  
2 incurred and benefits received by the participating customer. Costs under this test include  
3 costs borne by the customer, generally any up-front cost for a given energy saving  
4 measure that the customer must pay, and any loan repayments that must be made over  
5 time. Benefits are comprised of energy savings at the full retail rate, and any loan or cash  
6 rebate received by the customer from any source.

7 **Q. WHAT WAS OR WERE THE COMPANY'S ERROR(S) THAT YOU HAVE**  
8 **IDENTIFIED IN THE PCT?**

9 A. The Company made two significant errors that I have identified. First, its analysis did not  
10 include any benefit of on-bill repayment loans to customers.<sup>49</sup> Second, the Company  
11 counted the market value of any equipment provided to customers as a benefit, *in*  
12 *addition to* the energy savings provided by that equipment. This is double-counting,  
13 because energy saving investments do not have intrinsic value to the customer beyond the  
14 associated reduction in energy use. Providing equipment to a customer is fundamentally  
15 different in this way from providing a cash rebate to reimburse a customer for part of his  
16 or her expenditure on equipment; however, the Company has treated them as if they are  
17 the same.

18 **Q. PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE PROGRAM**  
19 **ADMINISTRATOR COST TEST.**

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<sup>49</sup> Line 9 of Appendix E to Schedule KR-CEF-EE-2 describes "Lifetime Participant Costs" as the "PV of initial costs & repayments by participants." However, this is an inaccurate description; this line is actually calculated as the undiscounted total participant contribution, whether paid up-front or over time.

1     A.     The PAC Test is designed to evaluate cost-effectiveness from the perspective of the  
2           utility, comparing the cost of saving energy to the cost of procuring an equivalent amount  
3           of energy. Costs under this test include any costs (program and administrative) borne by  
4           the Utility in implementing the savings, while benefits are comprised of all avoided costs  
5           of procuring and delivering energy and capacity.

6     **Q.     WHAT WAS OR WERE THE COMPANY'S ERROR(S) THAT YOU HAVE**  
7           **IDENTIFIED IN THE PAC TEST?**

8     A.     Once again, the Company has ignored the cost of its loans to customers as part of its  
9           program offerings. The Company intends to treat its outstanding program customer loan  
10          balances as regulatory assets, meaning that PSE&G will seek to recover from its  
11          ratepayers its full authorized cost of capital on open loan balances. As this is a utility cost  
12          that is passed through to ratepayers, it should be included in the PAC test.

13    **Q.     PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE RATEPAYER**  
14          **IMPACT MEASURE TEST.**

15    A.     The RIM test, sometimes called the "non-participant" test, views cost-effectiveness from  
16          the perspective of costs imposed and savings realized by ratepayers, but without  
17          considering the benefits of participation. The RIM test is distinguished from other tests  
18          such as the TRC because it counts utility costs at the full retail rate, with the rationale that  
19          the utility's margin is not funded by EE program participants (because they are using less  
20          energy) and will ultimately have to be funded by nonparticipants through higher rates.

21    **Q.     WHAT WAS OR WERE THE COMPANY'S ERROR(S) YOU HAVE**  
22          **IDENTIFIED IN THE RIM TEST?**

1     A.     Again, the Company has ignored the cost of its loans to customers, which contributes to  
2           utility costs and thus to rates. In addition, PSE&G has included as the “Lifetime Utility  
3           Cost” (row 14 in Schedule KR-CEF-EE-2, Appendix E) only the lost margin for sales,  
4           and not the full loss of revenue. This causes an inconsistency in the test, as the Company  
5           is claiming a benefit for ratepayers from foregone wholesale purchases of gas and  
6           electricity, but then ignoring the lost revenue from not selling that gas and electricity to  
7           its distribution customers.

8     **Q.     WHAT IS YOUR OVERALL CONCLUSION REGARDING THE COST**  
9           **BENEFIT ANALYSIS RESULTS PRESENTED BY PSE&G IN SUPPORT OF ITS**  
10          **PETITION?**

11    A.     The cost benefit analyses using the Participant Test, the Program Administrator Test, and  
12           the Ratepayer Impact Measure test, all of which are required under the Board’s MFRs,  
13           are infected by numerous errors in implementation and interpretation. Rate Counsel  
14           witness David Dismukes has addressed other problems which infect the Societal Cost  
15           Test. Overall, I find that the Company’s analyses cannot be relied upon to accurately  
16           reflect the cost effectiveness of its proposed programs.

17    **V.     Issues of Equity**

18    **Q.     WHAT HAS PSE&G PROJECTED AS THE TOTAL BENEFIT OF ITS**  
19          **PROPOSED PROGRAMS IN TERMS OF CUSTOMER MONETARY SAVINGS?**

20    A.     The Company claims that “the proposed CEF-EE Program is expected to reduce energy  
21           consumption by approximately 40.6 billion kWh and 675 million therms, resulting in a

1 net reduction in participating customers' energy bills of \$5.7 billion over the life of the  
2 energy efficiency measures.”<sup>50</sup> On a present value basis, row 12 of Schedule KR-CEF-  
3 EE-2, Appendix E shows total customer savings of \$2.79 billion, while the costs  
4 (customer costs, administrative costs, and program investment costs; rows 9, 10, and 11  
5 of Schedule KR-CEF-EE-2, Appendix E, respectively) total \$1.72 billion.

6 **Q. WILL THESE SAVINGS BE AVAILABLE EQUALLY TO ALL PSE&G**  
7 **CUSTOMERS?**

8 A. No. Because not all PSE&G ratepayers are eligible or able to participate in all programs,  
9 certain customers stand to gain much more benefit from the proposed programs than  
10 others. If the Company's calculations are accurate, the programs represent an investment  
11 with retail energy savings that are 62% more valuable than the total cost on a present  
12 value basis.<sup>51</sup> However, the CEF-EE program costs would be borne by all ratepayers,  
13 whether they are eligible (or choose) to participate in various programs or not, while the  
14 benefits disproportionately accrue to the participants in the various programs.

15 **Q. WHAT IS YOUR RECOMMENDATION WITH RESPECT TO EQUITY ISSUES**  
16 **RELATED TO THE PROPOSED PROGRAMS?**

17 A. It is an inevitable consequence of socialized energy efficiency programs, like all  
18 socialized investments, that some customers are going to benefit out of proportion to their

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<sup>50</sup> Petition, ¶20.

<sup>51</sup> Based on Schedule KR-CEF-EE-2 Appendix E: the Company proposes a program that will cost \$1,719,474,333 in total (lines 9-11) and will yield “lifetime participant benefits” of \$2,787,723,306 (line 12 Appendix A.) Using the Company's updated CBA numbers, provided in response to Data Request S-PSEG-EE-ENE-0005 this value rises to 69% (\$2,910,894,692 vs. \$1,719,474,333).

1 share of the costs, and many ratepayers who bear CEF-EE program costs will not benefit  
2 from the programs. As such programs grow larger and more have a greater impact on  
3 ratepayers, it becomes even more critical that the Board ensure that as many customers as  
4 possible have a full opportunity to participate in its programs and that costs are  
5 reasonably allocated among rate classes commensurate with the benefits available to  
6 each. This issue is likely to be addressed by the Board in its ongoing proceedings  
7 pursuant to the CEA. This is yet another reason that PSE&G's filing is premature and  
8 should be rejected.

9 **VI. Use of Customer Data**

10 **Q. UNDER ITS PROPOSED PROGRAMS, WOULD PSE&G BE COLLECTING**  
11 **CUSTOMER DATA THAT HAS COMMERCIAL VALUE?**

12 **A.** Yes. Should the Board approve PSE&G's proposed programs, and even under its existing  
13 programs, certain program elements involve collection of customer data along with  
14 information on energy usage patterns, purchase patterns, and even just the fact that  
15 certain customers choose to participate in each of the programs. Customers may  
16 reasonably be concerned about the data collected from them, as well as about the privacy,  
17 security, use, and revenue derived from those data.

18 **Q. WHAT IS YOUR RECOMMENDATION FOR THE BOARD REGARDING THE**  
19 **USE OF ANY INFORMATION COLLECTED FROM, ON, OR ABOUT PSE&G'S**  
20 **CUSTOMERS THROUGH ITS PROPOSED PROGRAMS?**

1     A.     PSE&G should have a clear and readily accessible policy regarding the collection and use  
2           of customer data. No identifiable customer data acquired by the Company should be used  
3           by PSE&G or any third party other than for the provision of regulated electric and gas  
4           service. In addition, should PSE&G or any third party use aggregated and anonymized  
5           data for any commercial purpose, the resulting revenue should accrue to PSE&G's  
6           ratepayers to offset program costs.

7   **VII.    Recommendations on Proposed Program and Subprograms**

8     **Q.     WHAT ARE YOUR OVERALL RECOMMENDATIONS FOR BOARD ACTION**  
9           **ON PSE&G'S PROPOSED PROGRAM OVERALL?**

10    A.     As noted above, my overall recommendation is that the Board reject PSE&G's petition  
11           overall because (1) it is predicated on a poorly conceived, premature and unreasonable  
12           elimination of other providers of energy efficiency services in its territory, and in  
13           particular OCE; and (2) the underlying analyses are fatally flawed and cannot be relied  
14           upon to support the Company's proposals, particularly with such an ambitious and  
15           expensive program. However, if the Board decides that an interim program is needed  
16           pending the completion of the studies and processes mandated by the CEA, it is my  
17           recommendation that the Board approve a two-year extension of the Company's existing  
18           programs with a commensurate extension of the budget.

19   **VIII.   Overall Recommendations**

20    **Q.     WHAT ARE YOUR RECOMMENDATIONS IN THIS MATTER?**

21    A.     I make the following recommendations:

- 1       • The Board should reject the Company's overall proposal for a six-year, \$2.78 billion  
2       program, predicated as it is on PSE&G becoming the exclusive provider of regulated  
3       energy efficiency services in its service territory.
- 4       • If the Board decides that an interim EDC EE program is needed pending the completion  
5       of the studies and processes mandated by the CEA, the Board should direct the Company  
6       to continue its existing EE subprograms for a period of two additional years at a funding  
7       level consistent with the stipulated levels approved in its EE 2017 program, pending  
8       Board's establishment of energy efficiency targets, QPIs and other items pursuant to the  
9       CEA.
- 10      • The Board should direct the company to initiate the review of cost effectiveness and  
11      incentive levels under its EE 2017 Programs, as directed under paragraph 15 of the  
12      Stipulation of Settlement for its EE 2017 filing.<sup>52</sup>
- 13      • The Company should be directed to submit cost-benefit analyses in any future filings that  
14      follows standard practices, remedying the flaws found in the cost-benefit analyses  
15      submitted in its Petition as discussed in my testimony and that of Rate Counsel witness  
16      David Dismukes.
- 17      • PSE&G should be directed to develop a clear and readily accessible policy regarding the  
18      collection and use of customer data which addresses the privacy, security and use of  
19      customer data. No identifiable customer data acquired by the Company should be used by  
20      PSE&G or any third party other than for the provision of regulated electric and gas  
21      service. In addition, should PSE&G or any third party use aggregated and anonymized  
22      data for any commercial purpose, the resulting revenue should accrue to PSE&G's  
23      ratepayers to offset program costs.

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<sup>52</sup> Stipulation of Settlement, BPU Docket No. EO17030196, Order dated 8/23/17.



1    **Q.    DOES THIS CONCLUDE YOUR TESTIMONY?**

2    **A.**    Yes, it does at this time. Rate Counsel reserves its right to present supplemental  
3    testimony based on any updated and/or new information.

# CURRICULUM VITAE

**Ezra D. Hausman, Ph.D.**

I am an independent consultant in energy and environmental economics.

I have worked for over twenty years as an electricity market expert with a focus on market design and market restructuring, environmental regulation in electricity markets, and pricing of energy, capacity, transmission, losses and other electricity-related services. I have performed market analysis, provided expert testimony, led workshops and working groups, made presentations and participated on panels, and provided other support to clients in a number of areas, including:

- Economic analysis, price forecasting, and asset valuation in electricity markets
- Dispatch and planning model analyses, and review of modeling studies
- Electricity and generating capacity market design and analysis
- Energy efficiency program and cost/benefit analysis
- Integrated Resource Planning and portfolio analysis
- Economic analysis of environmental and other regulations, including regulation of greenhouse gas emissions, in electricity markets
- Quantification, regulation and mitigation of greenhouse gas emissions associated with the supply and demand sides of the U.S. electricity sector
- Quantification of the economic and environmental benefits of displaced emissions associated with energy efficiency and renewable energy initiatives
- Expert representation and participation in stakeholder processes
- Clean Air Act determinations and enforcement.

I have prepared reports and offered other expert services on these and other related topics for clients including federal and state agencies; offices of consumer advocate; legislative bodies; cities and towns; non-governmental organizations; foundations; industry associations; and resource developers.

I previously served as Vice President and Chief Operating Officer of Synapse Energy Economics, Inc. of Cambridge, Massachusetts. In addition to my consulting portfolio, this management role entailed responsibility for day-to-day operations of the company including overseeing finance, HR, communications & marketing, quality assurance, client service, and professional development of staff. I had overall responsibility for ensuring that project managers and project teams had the tools, information, and training they needed to successfully serve client's needs and to produce high-quality deliverables on time and on budget. I was also a resource available to any of our clients to address any issues of customer service, quality, or any other issues.

I hold a Ph.D. in atmospheric science from Harvard University, an S.M. in applied physics from Harvard University, an M.S. in water resource engineering from Tufts University, and a B.A. in psychology from Wesleyan University.

## **PROFESSIONAL EXPERIENCE**

**Ezra Hausman Consulting**, Newton, MA. President, March 2014 – Present.

I provide research, analysis, expert testimony, and policy support services in regulatory, litigation, and stakeholder processes covering a wide range of electric sector and electricity market issues. The focus of my consulting work includes:

- Interaction of air quality and environmental regulations with electricity markets
- Analysis and implementation of the Clean Power Plan and other greenhouse gas rules
- Clean Air Act enforcement support
- Long-term electric power system planning and market design
- Energy efficiency and renewable energy programs and policies
- Avoided emissions analysis
- Regulation and mitigation of greenhouse gas emissions
- Consumer and environmental protection
- Efficient pricing of generating and transmission capacity
- Market power and market concentration analysis in electricity markets
- Economic analysis of electricity industry regulation and restructuring

**Synapse Energy Economics Inc.**, Cambridge, MA.

Chief Operating Officer, March 2011 – February 2014;

Vice President, July 2009 – February 2014;

Senior Associate, 2005-2009.

- Conducted research, wrote reports, and presented expert testimony pertaining to consumer, environmental, and public policy implications of electricity industry regulation. Provided expert support and representation in planning, greenhouse gas mitigation, and other stakeholder processes.
- As Vice President and Chief Operating Officer, I was also responsible for day-to-day operations of the company, quality assurance, client service, and professional development of staff.

**Charles River Associates (CRA)**, Cambridge, MA. Senior Associate, 2004-2005

*CRA acquired Tabors Caramanis & Associates in October, 2004.*

**Tabors Caramanis & Associates**, Cambridge, MA. Senior Associate, 1998-2004

As a member of the modeling group, developed and maintained dispatch modeling capability in support of electricity market consulting practice.

Performed modeling and analysis of electricity markets, generation and transmission systems. Projects included:

- Several market transition cost-benefit studies for development of Locational Marginal Price (LMP) based markets in US electricity markets
- Long-term market forecasting studies for valuation of generation and transmission assets,
- Valuation of financial instruments relating to transmission system congestion and losses
- Modeling and analysis of hydrologically and electrically interconnected hydropower system operations
- Natural gas market analysis and price forecasting studies
- Co-developed an innovative approach to hedging financial risk associated with transmission system losses of electricity
- Designed, developed and ran training seminars using a computer-based electricity market simulation game, to help familiarize market participants and students in the operation of LMP-based electricity markets.
- Developed and implemented analytical tools for assessment of market concentration in interconnected electricity markets, based on the “delivered price test” for assessing market accessibility in such a network
- Performed regional market power and market power mitigation studies
- Performed transmission feasibility studies for proposed new generation and transmission projects in various locations in the US
- Provided analytical support for expert testimony in a variety of regulatory and litigation proceedings, including breach of contract, bankruptcy, and antitrust cases, among others.

**Global Risk Prediction Network, Inc.,** Greenland, NH. Vice President, 1997-1998

Developed private sector applications of climate forecast science in partnership with researchers at Columbia University. Specific projects included a statistical assessment of grain yield predictability in several crop regions around the world based on global climate indicators (Principal Investigator); a statistical assessment of road salt demand predictability in the United States based on global climate indicators (Principal Investigator); a preliminary design of a climate and climate forecast information website tailored to the interests of the business community; and the development of client base.

**Hub Data, Inc.,** Cambridge, MA. Financial Software Consultant, 1986-1987, 1993-1997

Responsible for design, implementation and support of analytic and communications modules for bond portfolio management software; and developed software tools such as dynamic data compression technique to facilitate product delivery, Windows interface for securities data products.

**Abt Associates, Inc.,** Cambridge, MA. Environmental Policy Analyst, 1990-1991

Quantitative risk analysis to support federal environmental policy-making. Specific areas of research included risk assessment for federal regulations concerning sewage sludge disposal

and pesticide use; statistical alternatives to Most-Exposed-Individual risk assessment paradigm; and research on non-point sources of water pollution.

**Massachusetts Water Resources Authority**, Charlestown, MA. Analyst, 1988-1990

Applied and evaluated demand forecasting techniques for the Eastern Massachusetts service area. Assessed applicability of various techniques to the system and to regional planning needs; and assessed yield/reliability relationship for the eastern Massachusetts water supply system, based on Monte-Carlo analysis of historical hydrology.

**Somerville High School**, Somerville, MA. Math Teacher, 1986-1987

Courses included trigonometry, computer programming, and basic math.

## **EDUCATION**

**Ph.D.**, Earth and Planetary Sciences. Harvard University, Cambridge, MA, 1997

**S.M.**, Applied Physics. Harvard University, Cambridge, MA, 1993

**M.S.**, Civil Engineering. Tufts University, Medford, MA, 1990

**B.A.**, Wesleyan University, Psychology. Middletown, CT, 1985

## **FELLOWSHIPS, AWARDS AND AFFILIATIONS**

**UCAR Visiting Scientist Postdoctoral Fellowship**, 1997

**Postdoctoral Research Fellowship**, Harvard University, 1997

**Certificate of Distinction in Teaching**, Harvard University, 1997

**Graduate Research Fellowship**, Harvard University, 1991-1997

**Invited Participant**, UCAR Global Change Institute, 1993

**House Tutor**, Leverett House, Harvard University, 1991-1993

**Graduate Research Fellowship**, Massachusetts Water Resources Authority, 1989-1990

### ***Teaching Fellowships:***

**Harvard University:** *Principles of Measurement and Modeling in Atmospheric Chemistry; Hydrology; Introduction to Environmental Science and Public Policy; The Atmosphere.*

**Wesleyan University:** *Introduction to Computer Programming; Psychological Statistics; Playwriting and Production.*

## **Community Service**

*Vice President of Finance, Congregation Dorshei Tzedek, 2018 - Ongoing*  
*Academic Mentor and Athletic Coach, SquashBusters Boston, 2014 - Ongoing*  
*Judge, Cleantech Open innovation competitions, 2015-2016*  
*President, Burr Elementary School Parent Teacher Organization, 2005-2007*

## **EXPERT TESTIMONY AND SERVICES**

### **Virginia State Corporation Commission (Case No. PUR-2018-00065) – 2018-Ongoing**

Expert witness on behalf of the Sierra Club in Dominion Power IRP proceeding.

### **New Jersey Division of Rate Counsel – 2016-Ongoing**

General policy and stakeholder support on matters related to energy efficiency, renewable energy, and electrification of transportation in New Jersey.

### **New Jersey Board of Public Utilities – 2014-Ongoing**

Expert witness on behalf of the New Jersey Division of Rate Counsel, reviewing and providing testimony on cost effectiveness and program design of various New Jersey gas utility energy efficiency programs.

### **Missouri Public Service Commission (Case No. EO-2018-0038) – 2018**

Expert services in support of Sierra Club's participation in integrated resource planning process.

### **Florida Public Service Commission (Docket No. 20170225-EI) – 2017-2018**

Expert witness on behalf of the Sierra Club in FPL Determination of Need proceeding.

### **North Carolina Utilities Commission (Docket No. E-7, SUB 1146) – 2017-2018**

Expert witness on behalf of the Sierra Club in Duke Energy Carolinas rate case.

### **North Carolina Utilities Commission (Docket No. E-2, SUB 1142) – 2017**

Expert witness on behalf of the Sierra Club in Duke Energy Progress rate case.

### **Idaho Public Utilities Commission (Case No. AVU-E-17-01) – 2017**

Expert witness on behalf of the Sierra Club in Avista Corporation rate case.

### **Iowa Utilities Board (Docket No. RPU-2017-0002) – 2017**

Expert witness on behalf of the Sierra Club for Interstate Power and Light petition for ratemaking principles for proposed 500 MW wind project.

### **Washington Utilities and Transportation Commission (Dockets UE-170033 and UG-170034) – 2017**

Expert witness on behalf of the Sierra Club in Puget Sound Energy (PSE) rate case.

### **Clean Power Plan Modeling in PJM and MISO – 2016-2017**

Participation on behalf of the Sustainable FERC Project in ISO initiative to model scenarios for state compliance with federal greenhouse gas mitigation rules.

### **California ISO/PacifiCorp Market Integration – 2015-2017**

Technical support to Sierra Club in stakeholder review and participation in all relevant proceedings in California.

**United States Department of Justice – US District Court Dallas, TX Division (U.S. vs. Luminant Generation Company, LLC, and Big Brown Power Company, LLC) – Ongoing**  
Expert witness on behalf of the United States Department of Justice on clean air act enforcement case.

**United States Department of Justice – US District Court for the Eastern District of Missouri (Civil Action No. 4:11-CV-00077) – 2013-Ongoing**  
Expert witness on behalf of the United States Department of Justice on successful prosecution of clean air act case.

**Missouri Public Service Commission (Case No. EO-2015-0084) – 2014-2015**  
Expert services in support of Sierra Club's participation in integrated resource planning process.

**Missouri Public Service Commission (File No. ER-2014-0258) – 2014-2015**  
Expert witness on behalf of the Sierra Club in Ameren Missouri rate case.

**Arizona Corporation Commission (Docket No. E-01345A-11-0224) – 2014**  
Expert witness on behalf of the Sierra Club regarding Arizona Public Service petition for rate treatment for acquisition of an additional ownership share of the Four Corners generating units.

**Missouri Public Service Commission (Docket No. ET-2014-0085) – 2013**  
Testimony on behalf of the Missouri Solar Energy Industries Association regarding Union Electric (d/b/a Ameren Missouri) motion to suspend payment of solar rebates.

**Missouri Public Service Commission (Docket No. ET-2014-0059 and ET-2014-0071) – 2013**  
Testimony on behalf of the Missouri Solar Energy Industries Association regarding Kansas City Power and Light Company's motions to suspend payment of solar rebates.

**Eastern Interconnect Planning Collaborative (EIPC) – 2012-2013**  
Expert support on behalf of coalition of NGO stakeholders in transmission and resource planning process, including development and review of modeling assumptions and interim results, and development of comments.

**Puget Sound Energy (PSE) – 2012-2013**  
Expert participant in PSE's 2013 IRP stakeholder process on behalf of the Sierra Club.

**Washington Utilities and Transportation Commission (Docket Nos. UE-111048 and UG-111049) – 2011**  
Testimony on behalf of the Sierra Club regarding the cost of operating the Colstrip power plant and other power procurement issues.

**Kansas Corporation Commission (Docket No. 11-KCPE-581-PRE) - 2011**  
Presented written and live testimony on behalf of the Sierra Club regarding Kansas City Power and Light request for predetermination of ratemaking principles.



**Vermont Department of Public Service - 2011**

Provided scenario analysis of the costs and benefits of various electric energy resource scenarios in support of the state Comprehensive Energy Plan.

**Massachusetts Department of Energy Resources – 2009-2011**

Served as expert analyst and modeling coordinator for analysis related to implementation of the Massachusetts Global Warming Solutions Act.

**Iowa Office of Consumer Advocate – 2010-2011**

Assisted Consumer Advocate in evaluating a proposed power purchase agreement for the output of the Duane Arnold nuclear power station.

**Missouri Public Service Commission (Docket No. EW-2010-0187) – 2010**

Expert participant on behalf of the Sierra Club in stakeholder process to develop a “demand side investment mechanism” in Missouri.

**Louisiana Public Service Commission (Docket No. R-28271 Subdocket B) – 2009-2010**

Expert participant on behalf of the Sierra Club in Renewable Portfolio Standard Task Force considering RPS for Louisiana.

**Joint Fiscal Committee of the Vermont Legislature – 2008-2010**

Serving as lead expert advising the Legislature on economic issues related to the possible recertification of the Vermont Yankee nuclear power plant.

**Town of Littleton, NH – 2006-2010**

Serving as expert witness on the value of the Moore hydroelectric facility.

**Nevada Public Service Commission (Docket No. 08-05014) – August 2008**

Presented prefiled and live testimony on behalf of Nevadans for Clean Affordable Reliable Energy regarding the proposed Ely Energy Center and resource planning practices in Nevada.

**Mississippi Public Service Commission (Docket No. 2008-AD-158) – July 2008**

Presented written and live testimony on behalf of the Sierra Club regarding the resource plans filed by Entergy Mississippi and Mississippi Power Company.

**Kansas House of Representatives - Committee on Energy and Utilities – February 2008**

Presented testimony on behalf of the Climate and Energy Project of the Land Institute of Kansas on a proposed bill regarding permitting of power plants. Focus was on the risks and costs associated with new coal plants and on their contribute to global climate change.

**Vermont Public Service Board (Docket No. 7250) – 2006-2008**

Prepared report and testimony in support of the application of Deerfield Wind, LLC. For a Certificate of Public Good for a proposed wind power facility.

**Iowa Utilities Board (Docket No. GCU-07-1) – October, 2007 – January 2008**

Presented wrtten and live testimony on behalf of the Iowa Office of Consumer Advocate regarding the science of global climate change and the contribution of new coal plants to atmospheric CO<sub>2</sub>.

**Nevada Public Service Commission (Docket No. 07-06049) – October 2007**

Presented prefiled direct testimony on behalf of Nevadans for Clean Affordable Reliable Energy regarding treatment of carbon emissions costs and coal plant capital costs in utility resource planning.

**Massachusetts General Court, Joint Committee on Economic Development and Emerging Technologies – July 2007**

Presented written and live testimony on climate change science and the potential benefits of a revenue-neutral carbon tax in Massachusetts.

**Town of Rockingham, VT – 2006-2007**

Served as expert witness on the value of the Bellows Falls hydroelectric facility.

**South Dakota Public Utilities Commission (Case No EL05-22) – June 2006**

**Minnesota Public Utilities Commission (Docket TR-05-1275) – December 2006**

Submitted prefiled and live testimony on the contribution of the proposed Big Stone II coal-fired generator to atmospheric CO<sub>2</sub>, global climate change and the environment of South Dakota and Minnesota, respectively.

**Arkansas Public Service Commission (Docket No. 06-070-U) – October 2006**

Submitted prefiled direct testimony on inclusion of new wind and gas-fired generation resources in utility rate base.

**Federal Energy Regulatory Commission (Docket Nos. ER055-1410-000 and EL05-148-000) – May-Sept 2006**

- Participant in settlement hearings on proposed capacity market structure (the Reliability Pricing Model, or RPM) on behalf of State Consumer Advocates in Pennsylvania, Ohio and the District of Columbia
- Invited participant on technical conference panel on PJM's proposed Variable Resource Requirement (VRR) curve
- Filed Pre- and post-conference comments and affidavits with FERC
- Participated in numerous training and design conferences at PJM on RPM implementation.

**Illinois Pollution Control Board (Docket No. R2006-025) – June-Aug 2006**

Prefile and live testimony presented on behalf of the Illinois EPA regarding the costs and benefits of proposed mercury emissions rule for Illinois power plants.

**Long Island Sound LNG Task Force – January 2006**

Presentation of study on the need for and alternatives to the proposed Broadwater LNG storage and regasification facility in Long Island Sound.

**Iowa Utilities Board (Docket No. SPU-05-15) – November 2005**

Presented written and live testimony on whether Interstate Power and Light's should be permitted to sell the Duane Arnold Energy Center nuclear facility to FPLE Duane Arnold, Inc., a subsidiary of Florida Power and Light.

## PUBLICATIONS AND REPORTS

Hausman, E., *The Worst of Both Worlds: Why the Ohio Legislature's OVEC Bailout Bill would Harm Consumers, Impede Competition, Increase Pollution, and Impair the Health and Welfare of Ohioans for Decades*. White paper produced on behalf of The Sierra Club, June 2017.

Hausman, E., *Risks and Opportunities for PacifiCorp - State Level Findings: Utah*, Produced on behalf of the Sierra Club, October 2014.

Hausman, E., *Risks and Opportunities for PacifiCorp - State Level Findings: Oregon*, Produced on behalf of the Sierra Club, October 2014.

Hausman, E., *Risks and Opportunities for PacifiCorp in a Carbon Constrained Economy*, Produced on behalf of the Sierra Club, October 2014.

Luckow, P., E. Stanton, B. Biewald, J. Fisher, F. Ackerman, E. Hausman, 2013 Carbon Dioxide Price Forecast, Synapse Energy Economics, November 2013.

Stanton, E., T. Comings, K. Takahashi, P. Knight, T. Vitolo, E. Hausman, *Economic Impacts of the NRDC Carbon Standard: Background Report prepared for the Natural Resources Defense Council*, Synapse Energy Economics for NRDC, June 2013

Comings T., P. Knight, E. Hausman, *Midwest Generation's Illinois Coal Plants: Too Expensive to Compete? (Report Update)* Synapse Energy Economics for Sierra Club, April 2013

Stanton E., F. Ackerman, T. Comings, P. Knight, T. Vitolo, E. Hausman, *Will LNG Exports Benefit the United States Economy?* Synapse Energy Economics for Sierra Club, January 2013

Chang M., D. White, E. Hausman, *Risks to Ratepayers: An Examination of the Proposed William States Lee III Nuclear Generation Station, and the Implications of "Early Cost Recovery" Legislation*, Synapse Energy Economics for Consumers Against Rate Hikes, December 2012

Wilson R., P. Luckow, B. Biewald, F. Ackerman, and E.D. Hausman, *2012 Carbon Dioxide Price Forecast*, Synapse Energy Economics, October 2012.

Fagan B., M. Chang, P. Knight, M. Schultz, T. Comings, E.D. Hausman, and R. Wilson, *The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region*. Synapse Energy Economics for Energy Future Coalition, May 2012.

Hausman, E.D., T. Comings, *"Midwest Generation's Illinois Coal Plants: Too Expensive to Compete?"* Synapse Energy Economics for Sierra Club, April 2012.

Hausman, E.D., T. Comings, and G. Keith, *Maximizing Benefits: Recommendations for Meeting Long-Term Demand for Standard Offer Service in Maryland*. Synapse Energy Economics for Sierra Club, January 2012.

Keith G., B. Biewald, E.D. Hausman, K. Takahashi, T. Vitolo, T. Comings, and P. Knight, *Toward a Sustainable Future for the U.S. Power Sector: Beyond Business as Usual 2011* Synapse Energy Economics for Civil Society Institute, November 2011.

Chang M., D. White, E.D. Hausman, N. Hughes, and B. Biewald, *Big Risks, Better Alternatives: An Examination of Two Nuclear Energy Projects in the U.S.* Synapse Energy Economics for Union of Concerned Scientists, October 2011.

Hausman E.D., T. Comings, K. Takahashi, R. Wilson, and W. Steinhurst, *Electricity Scenario Analysis for the Vermont Comprehensive Energy Plan 2011.* Synapse Energy Economics for Vermont Department of Public Service, September 2011.

Wittenstein M., E.D. Hausman, *Incenting the Old, Preventing the New: Flaws in Capacity Market Design, and Recommendations for Improvement.* Synapse Energy Economics for American Public Power Association, June 2011.

Johnston L., E.D. Hausman, B. Biewald, R. Wilson, and D. White. *2011 Carbon Dioxide Price Forecast.* Synapse Energy Economics White Paper, February 2011.

Hausman E.D., V. Sabodash, N. Hughes, and J. I. Fisher, *Economic Impact Analysis of New Mexico's Greenhouse Gas Emissions Rule.* Synapse Energy Economics for New Energy Economy, February 2011.

Hausman E.D., J. Fisher, L. Mancinelli, and B. Biewald. *Productive and Unproductive Costs of CO<sub>2</sub> Cap-and-Trade: Impacts on Electricity Consumers and Producers.* Synapse Energy Economics for National Association of Regulatory Utility Commissioners, National Association of State Utility Consumer Advocates, National Rural Electric Cooperative Association, and American Public Power Association, July 2009.

Peterson P., E. Hausman, R. Fagan, and V. Sabodash, *Report to the Ohio Office of Consumer Counsel, on the value of continued participation in RTOs. Filed under Ohio PUC Case No. 09-90-EL-COI,* May 2009.

Schlissel D., L. Johnston, B. Biewald, D. White, E. Hausman, C. James, and J. Fisher, *Synapse 2008 CO<sub>2</sub> Price Forecasts.* July 2008.

Hausman E.D., J. Fisher and B. Biewald, *Analysis of Indirect Emissions Benefits of Wind, Landfill Gas, and Municipal Solid Waste Generation.* Synapse Energy Economics Report to the Air Pollution Prevention and Control Division, National Risk Management Research Laboratory, U.S. Environmental Protection Agency, July 2008.

Hausman E.D. and C. James, *Cap and Trade CO<sub>2</sub> Regulation: Efficient Mitigation or a Give-away?* Synapse Energy Economics presentation to the ELCON Spring Workshop, June 2008.

Hausman E.D., R. Hornby and A. Smith, *Bilateral Contracting in Deregulated Electricity Markets.* Synapse Energy Economics for the American Public Power Association, April 2008.

Hausman E.D., R. Fagan, D. White, K. Takahashi and A. Napoleon, *LMP Electricity Markets: Market Operations, Market Power and Value for Consumers.* Synapse Energy Economics for the American Public Power Association's Electricity Market Reform Initiative (EMRI) symposium, "Assessing Restructured Electricity Markets" in Washington, DC, February 2007.

Hausman E.D. and K. Takahashi, *The Proposed Broadwater LNG Import Terminal Response to Draft Environmental Impact Statement and Update of Synapse Analysis*. Synapse Energy Economics for the Connecticut Fund for the Environment and Save The Sound, January 2007.

Hausman E.D., K. Takahashi, D. Schlissel and B. Biewald, *The Proposed Broadwater LNG Import Terminal: An Analysis and Assessment of Alternatives*. Synapse Energy Economics for the Connecticut Fund for the Environment and Save The Sound, March 2006.

Hausman E.D., P. Peterson, D. White and B. Biewald, *RPM 2006: Windfall Profits for Existing Base Load Units in PJM: An Update of Two Case Studies*. Synapse Energy Economics for the Pennsylvania Office of Consumer Advocate and the Illinois Citizens Utility Board, February 2006.

Hausman E.D., K. Takahashi, and B. Biewald, *The Glebe Mountain Wind Energy Project: Assessment of Project Benefits for Vermont and the New England Region*. Synapse Energy Economics for Glebe Mountain Wind Energy, LLC., February 2006.

Hausman E.D., K. Takahashi, and B. Biewald, *The Deerfield Wind Project: Assessment of the Need for Power and the Economic and Environmental Attributes of the Project*. Synapse Energy Economics for Deerfield Wind, LLC., January 2006.

Hausman E.D., P. Peterson, D. White and B. Biewald, *An RPM Case Study: Higher Costs for Consumers, Windfall Profits for Exelon*. Synapse Energy Economics for the Illinois Citizens Utility Board, October 2005.

Hausman E.D. and G. Keith, *Calculating Displaced Emissions from Energy Efficiency and Renewable Energy Initiatives*. Synapse Energy Economics for EPA website 2005

Rudkevich A., E.D. Hausman, R.D. Tabors, J. Bagnal and C. Kopel, *Loss Hedging Rights: A Final Piece in the LMP Puzzle*. Hawaii International Conference on System Sciences, Hawaii, January, 2005 (accepted).

Hausman E.D. and R.D. Tabors, *The Role of Demand Underscheduling in the California Energy Crisis*. Hawaii International Conference on System Sciences, Hawaii, January 2004.

Hausman E.D. and M.B. McElroy, *The reorganization of the global carbon cycle at the last glacial termination*. *Global Biogeochemical Cycles*, 13(2), 371-381, 1999.

Norton F.L., E.D. Hausman and M.B. McElroy, *Hydrospheric transports, the oxygen isotope record, and tropical sea surface temperatures during the last glacial maximum*. *Paleoceanography*, 12, 15-22, 1997.

Hausman E.D. and M.B. McElroy, *Variations in the oceanic carbon cycle over glacial transitions: a time-dependent box model simulation*. Presented at the spring meeting of the American Geophysical Union, San Francisco, 1996.

## **PRESENTATIONS AND WORKSHOPS**

**American Public Power Association:** Invited expert participant in APPA's roundtable discussion of the current state of the RTO-operated electricity markets. October 2013.

**California Long-Term Resource Adequacy Summit** (Sponsored by the California ISO and the California Public Utility Commission): Panelist on “Applying Alternative Models to the California Market Construct.” February 26, 2013.

**ELCON 2011 Fall Workshop:** “Do RTOs Need a Capacity Market?” October 2011.

**Harvard Electricity Policy Group:** Presentation on state action to ensure reliability in the face of capacity market failure. February 2011.

**NASUCA 2010 Annual Conference:** “Addressing Climate Change while Protecting Consumers.” November 2010.

**NASUCA Consumer Protection Committee:** Briefing on the Synapse report entitled, “Productive and Unproductive Costs of CO<sub>2</sub> Cap-and-Trade.” September 2009.

**NARUC 2009 Summer Meeting:** Invited speaker on topic: “Productive and Unproductive Costs of CO<sub>2</sub> Cap-and-Trade.” July, 2009.

**NASUCA 2008 Mid-Year Meeting:** Invited speaker on the topic, “Protecting Consumers in a Warming World, Part II: Deregulated Markets.” June 2008.

**Center for Climate Strategies:** Facilitator and expert analyst on state-level policy options for mitigating greenhouse gas emissions. Serve as facilitator/expert for the Electricity Supply (ES) and Residential, Commercial and Industrial (RCI) Policy Working Groups in the states of Colorado and South Carolina. 2007-2008.

**NASUCA 2007 Mid-Year Meeting:** Invited speaker on the topic, “Protecting Consumers in a Warming World” June 2007.

**ASHRAE Workshop on estimating greenhouse gas emissions from buildings in the design phase:** Participant expert on estimating displaced emissions associated with energy efficiency in building design. Also hired by ASHRAE to document and produce a report on the workshop. April, 2007.

**Assessing Restructured Electricity Markets An American Public Power Association Symposium:** Invited speaker on the history and effectiveness of Locational Marginal Pricing (LMP) in northeastern United States electricity markets, February, 2007.

**ASPO-USA 2006 National Conference:** Invited speaker and panelist on the future role of LNG in the U.S. natural gas market, October, 2006.

**Market Design Working Group:** Participant in FERC-sponsored settlement process for designing capacity market structure for PJM on behalf of coalition of state utility consumer advocates, July-August 2006.

**NASUCA 2006 Mid-Year Meeting:** Invited speaker on the topic, “How Can Consumer Advocates Deal with Soaring Energy Prices?” June 2006.

**Soundwaters Forum, Stamford, CT:** Participated in a debate on the need for proposed Broadwater LNG terminal in Long Island Sound, June 2006.

**Energy Modeling Forum:** Participant in coordinated academic exercise focused on modeling US and world natural gas markets, December 2004.

**Massachusetts Institute of Technology (MIT):** Guest lecturer in Technology and Policy Program on electricity market structure, the LMP pricing system and risk hedging with FTRs. 2002-2005.

**LMP: The Ultimate Hands-On Seminar.** Two-day seminar held at various sites to explore concepts of LMP pricing and congestion risk hedging, including lecture and market simulation exercises. Custom seminars held for FERC staff, ERCOT staff, and various industry groups. 2003-2004.

**Learning to Live with Locational Marginal Pricing: Fundamentals and Hands-On Simulation.** Day-long seminar including on-line mock electricity market and congestion rights auction, December 2002.

**LMP in California.** Led a series of seminars on the introduction of LMP in the California electricity market, including on-line market simulation exercise. 2002.

Resume updated February 2019