

**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 ENERGY EFFICIENCY) BPU DOCKET NO. EO17030196
2017 PROGRAM AND RECOVERY OF)
ASSOCIATED COSTS (“EE 2017 PROGRAM”))**

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

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1 **I. Professional Qualifications and Purpose of Testimony**

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

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

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

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

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

- 17 • State and regional energy, capacity, and transmission planning, including both
18 utility resource planning and long-term (multi-decadal) climate-constrained
19 resource planning
- 20 • Electricity, generating capacity, and demand-side resource market design and
21 analysis
- 22 • Electric system dispatch modeling

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- 1 • Economic analysis of environmental and other regulations, including greenhouse
- 2 gas regulation, in electricity markets
- 3 • Economic analysis, price forecasting, and asset valuation in electricity markets
- 4 • Quantification of the economic and environmental benefits of displaced emissions
- 5 and market price impacts associated with energy efficiency and renewable energy
- 6 • Regulation and mitigation of greenhouse gas emissions from the supply and
- 7 demand sides of the U.S. electricity sector

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

15 Prior to joining Synapse, I was employed from 1998 through 2004 as a Senior
16 Associate at Tabors Caramanis and Associates (TCA) of Cambridge, Massachusetts. In
17 2004, TCA was acquired by Charles River Associates (CRA), where I remained until I
18 joined Synapse in 2005. At TCA/CRA, I performed a wide range of electricity market
19 and economic analyses and price forecast modeling studies. These included asset
20 valuation studies, market transition cost/benefit studies, market power analyses, and
21 litigation support. I have extensive personal experience with market simulation,
22 production cost modeling, and resource planning methodologies and software.

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

3 A. No. However, I have provided expert support to Rate Counsel for its participation in the
4 following dockets involving utility energy efficiency investments:

- 5 • BPU DOCKET NO. GO14121412: New Jersey Natural Gas SAVEGREEN
6 Continuation filing, 2014-2015.
- 7 • BPU DOCKET 0012050363: South Jersey Gas Energy Efficiency Program filing,
8 2015.
- 9 • BPU Docket Nos. GR16070618 and GO15050504: Pivotal Utility Holdings d/b/a
10 Elizabethtown Gas Energy Efficiency Program Extension filing, 2016-2017.

11 In each case the parties reached a stipulated settlement prior to submission of intervener
12 testimony.

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

14 A. The purpose of my testimony is to address a number of issues related to the EE 2017
15 Program filing submitted by Public Service Electric and Gas (“PSE&G” or, “the
16 Company”), which is an extension of its EE initiatives first initiated in 2008 and modified
17 and extended several times since.

18 In preparing this testimony, I have reviewed the filing including its supporting
19 workpapers and discovery responses provided in this matter, including the testimony of
20 PSE&G witness Courtney McCormick. I have performed a detailed analysis of the
21 Company’s Cost-Benefit Analysis (“CBA”) in support of its programs, as well as its

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1 reported costs for completed programs under the Energy Efficiency Extension II
2 Programs.

3 I note numerous errors in the Company’s CBA, leading to an erroneous and
4 misleading projection of the cost effectiveness of its existing and proposed programs. I
5 provide revised and corrected cost-benefit ratios, relying on the Company’s own input
6 values but a corrected analytical approach. I address how the Board should consider the
7 Company’s proposal given this revised cost-effectiveness assessment. I suggest ways in
8 which the programs and their cost effectiveness might be improved, and serve more
9 customers for the same budget; in particular, by reducing some of the overly-generous
10 incentives to levels that more widely share the program benefits while remaining
11 attractive and beneficial to participants. However, I find that it is difficult to reliably
12 judge the design of the proposed programs given the deficiencies in the Company’s CBA.

13 Finally, I make certain recommendations regarding the Company’s treatment of
14 customer data it proposes to collect under its Data Analytics and Smart Thermostats
15 programs.

16 **Q. HAVE YOU APPENDED ANY ITEMS TO YOUR TESTIMONY?**

17 A. Yes. I appended the following attachments:

Attachment No.	Content
EDH-1	Resume of Ezra D. Hausman, PH.D.
EDH-2	SPE&G response to Rate Counsel Discovery Request RCR-EE-0001
EDH-3	RCR-EE_0014_Overview of Gabel Methods Employed for EE 2017 Program - 3.14.17.docx
EDH-4	PSE&G Response to Rate Counsel Discovery Request RCR-EE-0035, Docket No. EO14080897 (PSE&G EE Extension II Filing)

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II. Summary of Conclusions and Recommendations

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE COMPANY’S COST-BENEFIT ANALYSIS?

A. I find that the Company’s CBA is deficient in that it contains numerous errors that lead to a dramatic under-reporting of the costs of each of the measures, leading to a significantly exaggerated benefit-to-cost ratio associated with its programs. When these errors are corrected, I find that *none* of the Company’s existing programs – the Multifamily, Hospital efficiency, and Direct Install programs – are cost effective from the perspective of the Total Resource Cost (“TRC”) test. The TRC is a standard cost-effectiveness test that compares all financial program benefits to all financial costs, regardless of whether they are benefits/costs to the program administrator or the participant. The poor TRC scores are an unusual finding that should cause the Board, the Company, and all stakeholders to carefully review these programs to determine why they perform so poorly on this standard cost-effectiveness test, and whether they provide sufficient ancillary benefits to justify their continued implementation.

In addition, when corrected for errors in implementation. all of the Company’s programs have particularly poor scores as measured by the Ratepayer Impact Measure (“RIM”) test. The RIM test measures the overall impact on ratepayers who do not participate in the programs, by comparing net savings that accrue to the program administrator to the total reduction in revenues from decreased retail sales. It is not

1 unusual, nor cause for great concern, for energy efficiency programs to have a benefit-to-
2 cost ratio below one on this test, because the retail value of the lost sales is naturally
3 greater than the wholesale value of avoided procurement. However, in this case I find that
4 the scores are particularly low, reflect in part the overly generous subsidies provided by
5 PSE&G to participants in the program. These generous subsidies are also evident in the
6 very high scores for these programs on the Participant Cost Test (“PCT”). The PCT
7 measures how cost-effective the programs are from the participant’s perspective, by
8 comparing customer retail bill savings to measure costs specifically borne by the
9 customer. This contrast, between very low RIM scores and very high PCT scores, shows
10 that PSE&G’s program benefits are distributed very much in favor of program
11 participants, relative to the programs offered by other utilities in New Jersey and
12 elsewhere.

13 Because PSE&G’s programs are not available to all customers, it should be of
14 particular concern to the Board that the benefits are weighted so heavily toward
15 participants. I make specific recommendations below for how the benefits can be shared
16 more widely.

17 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING PSE&G’S PROPOSED NEW**
18 **SUBPROGRAMS, SPECIFICALLY THE SMART THERMOSTAT AND DATA**
19 **ANALYTICS SUBPROGRAMS?**

20 A. I conclude that PSE&G’s proposed new subprograms will generally provide energy
21 savings benefits and are cost effective; however, the Company’s proposal is deficient in
22 that PSE&G has no explicit, written plan for managing the significant increase in

1 collection of customer data implied by its proposed programs. Customers need to know
2 that their utility has a clear, consistent, transparent, and enforceable policy when it comes
3 to handling of customer data. This deficiency should be addressed and resolved prior to
4 the implementation of either of the Company’s two proposed new data-intensive
5 programs.

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

7 A. I make the following recommendations:

- 8 • The Board should require the Company to submit a corrected, complete, and fully
9 documented cost-benefit analysis, with its methodology in full compliance with
10 the California Standard Practice Manual, making the specific corrections outlined
11 in my testimony.
- 12 • The Company should be directed to evaluate and document the incremental cost
13 of the measures included in its subprograms; that is, the portion of the total cost
14 that is specifically related to energy efficiency, instead of assuming the entire cost
15 of all measures is the same as incremental, efficiency-related cost. By including
16 the full cost of upgrades in its CBA, including costs that may not be related to
17 energy efficiency, PSE&G both distorts the CBA results (in this case, making
18 them appear worse than they are) and obscures a certain amount of free-ridership
19 that may be taking place at ratepayers’ expense.
- 20 • The Company should be required to reduce certain of its customer incentive levels
21 as recommended herein, so that the benefits of energy efficiency can be shared
22 more equitably between participants and the captive nonparticipant ratepayers
23 who nonetheless help to fund the program. This will also allow the Company to
24 serve more customers within its requested level of funding, which will help to
25 improve cost-effectiveness from the utility and ratepayer perspectives.

- 1 • The Company should be directed to propose modifications to its programs to
2 improve cost-effectiveness overall, in part by screening its customized
3 subprograms for specific certain measures for which the cost is far in excess of
4 the energy savings.

- 5 • The Company should be directed to develop and publish a comprehensive
6 customer data use and privacy policy prior to implementing its Smart Thermostat
7 and Data Analytics subprograms. This policy should address how the Company
8 collects, stores, aggregates, uses internally, and releases customer data consistent
9 with applicable law. It should also address data security issues, and any future
10 sales or sharing of aggregate data with third parties, including ownership and
11 revenue-sharing issues pertaining to any financial benefit received by PSE&G
12 from the sale or use of the data. The proposed policy should be clear, consistent,
13 and available for public review, and should be subject to Board approval.

14 III. Overview of Program Offerings

15 **Q. WHAT ARE THE EXISTING SUBPROGRAMS PSE&G IS PROPOSING TO** 16 **OFFER CUSTOMERS IN THIS FILING?**

17 A. PSE&G is proposing to continue three existing energy efficiency programs. These are:
18 (1) The Direct Install Subprogram; (2) The Hospital Efficiency Subprogram; and (3) the
19 Residential Multifamily Subprogram.

20 All three of these subprograms were included in PSE&G's Energy Efficiency
21 Economic Stimulus Program ("EEE Program") approved in July 2009, along with
22 numerous other offerings. These subprograms were the sole offerings in the Company's
23 EEE Extension Program approved in July 2011, as well as in its EEE Extension II
24 Program approved in April 2015.

1 **Q. PLEASE BRIEFLY DESCRIBE THE DIRECT INSTALL SUBPROGRAM.**

2 A. The Direct Install Subprogram serves government and non-profit facilities, as well as
3 small businesses located in Urban Enterprise Zones ("UEZ"), with a peak load of 200 kW
4 or less. As described by PSE&G witness Courtney McCormick, The Direct Install
5 Subprogram "reduces the complexity of implementing energy efficiency improvements
6 by providing a seamless turnkey service, from opportunity identification, to direct
7 installation of measures with no out of pocket cost, through the interest free repayment of
8 the customer's share on their PSE&G bill." (McCormick Direct, pp 9-10) Under this
9 subprogram, PSE&G pays 100% of the up-front cost of all measures, with the customer
10 repaying 30% of the cost over three years at 0% interest. (McCormick Direct pp. 10-11)

11 The small business element of this subprogram was first proposed in PSE&G's
12 EEE Extension II filing in 2014. In the stipulated settlement in that Docket,¹ the company
13 agreed to limit the small business component to facilities located in UEZs in order to
14 better complement, rather than compete with, programs offered by the NJ-CEP.

15 **Q. PLEASE BRIEFLY DESCRIBE THE HOSPITAL EFFICIENCY SUBPROGRAM.**

16 A. The Hospital Efficiency Subprogram provides audits and customized EE solutions for
17 hospitals and healthcare facilities which "may include HVAC, building envelope, motors,
18 lighting and other energy consuming equipment." (McCormick Direct, p.12) As with the
19 Direct Install Subprogram, PSE&G will provide all financing up-front, with the customer
20 repaying a reduced amount interest-free. In this case the Company proposes to "buy-
21 down" the cost of each project to a simple payback by up to six years, but to not less than

¹ BPU Docket No. EO14080897

1 three years, with the balance to be paid back by the customer over five years at 0%
2 interest. For example, if the initial simple payback would be ten years, the customer
3 would pay back 40% (4/10) of the cost over five years; if the simply payback were 6
4 years, the customer would pay back 50% (3/6) over five years.

5 **Q. PLEASE BRIEFLY DESCRIBE THE RESIDENTIAL MULTIFAMILY**
6 **SUBPROGRAM.**

7 A. The Residential Multifamily Subprogram provides audits and energy efficiency measures
8 for owners of multifamily housing facilities, defined as five units or greater. As with the
9 Hospital Efficiency Subprogram, the Company will pay 100% of the up-front cost of the
10 measures and will then buy-down the customer’s payback time by up to six years, with
11 the resulting payback time no less than three years.

12 **Q. HAS CUSTOMER DEMAND BEEN HIGH FOR THESE THREE EXISTING**
13 **SUBPROGRAMS?**

14 A. According to the Company, it has. As Ms. McCormick states, “These existing sub-
15 programs are forecasted to be fully committed during calendar year 2017. Customer
16 demand for all three sub-programs continues to be strong, and numerous potential
17 upgrades have been identified for new projects that cannot be funded within the current
18 sub-program budgets.”

19 Specifically, in response to Data Request RCR-EE-001(b), the PSE&G claimed
20 that it has a pipeline of 952 potential projects for the Direct Install Subprogram, 15 for
21 the Hospital Efficiency Subprogram, and 13 for the Residential Multifamily Subprogram.
22 Based on PSE&G’s rough estimates of the value of these projects as reflected in, it would

1 far exceed the entire budget request for these three programs in the instant filing.

2 (PSE&G’s response to Data Request RCR-EE-0001 is provided as Attachment EDH-2)

3 **Q. WHAT CHANGES IS PSE&G PROPOSING FOR ITS EXISTING**
4 **SUBPROGRAMS?**

5 A. PSE&G is proposing the following modifications to these subprograms:

- 6 • For both the Hospital Efficiency and the Residential Multifamily subprograms,
7 PSE&G proposes to allow any measures that have a simple payback time that is
8 less than the expected measure life. According to Ms. McCormick, this is
9 “consistent with NJCEP protocols and generally accepted engineering practices,
10 will be considered for inclusion in the sub-program. This enables cost-effective
11 yet longer payback term ECMs, such as boiler replacements, to be included in the
12 project.” (McCormick Direct, p. 14)
- 13 • Also for both the Hospital Efficiency and the Residential Multifamily
14 subprograms, PSE&G proposes to allow for a reduced incentive, if necessary, to
15 maintain cost effectiveness. The Company would offer buy-down of less than six
16 years, on a case-by-case basis, for this purpose.

17 **Q. ARE PSE&G’S PROGRAM OFFERINGS SIMILAR TO PROGRAMS OFFERED**
18 **BY OTHER UTILITIES IN NEW JERSEY?**

19 A. Only partly. Other New Jersey utilities, including South Jersey Gas and Elizabethtown
20 Gas, offer customized commercial and industrial programs with financing similar to
21 PSE&G’s Direct Install program, although the limitation of this program to urban
22 enterprise zones may be unique. I am not aware of other utilities that have programs like

1 the Hospital Efficiency and Multifamily programs. Numerous utilities are implementing
2 Data Analytics, at least in pilot studies, in the form of periodic OPower reports.

3 The primary difference I find between PSE&G's program and that of other New
4 Jersey utilities is that PSE&G is relying entirely on financing subprograms in which the
5 utility pays the entire cost up-front, with the participant paying back a portion of the cost
6 as a zero-interest loan. As proposed, these combined benefits add up to a very generous
7 incentive for the participants, as evidenced by the extremely high scores on the PCT.
8 PSE&G does not offer rebate incentives or home energy assessments for homeowners.
9 These are staples of the programs offered by Elizabethtown Gas, New Jersey Natural
10 Gas, and South Jersey Gas, and are designed to dovetail with programs and incentives
11 offered by the New Jersey Clean Energy Program (NJ-CEP)

12
13 **Q. WHAT ARE THE NEW SUBPROGRAMS PSE&G IS PROPOSING TO OFFER**
14 **CUSTOMERS IN THIS FILING?**

15 A. PSE&G is offering two new subprograms: A Smart Thermostat Subprogram, which will
16 make it easier for customers to control their energy use by varying the output of their
17 HVAC systems to match their occupancy and comfort level needs, and a Data Analytics
18 Pilot Subprogram, which will provide energy use reports to customers along with tips on
19 how they can save energy and money.

20 For the Smart Thermostat program, "PSE&G proposes to discount the upfront
21 cost of a Wi-Fi smart thermostat and provide on-bill repayment for the remaining cost,
22 including installation services if applicable." (McCormick, p.19) As a result, customers

1 can purchase a thermostat worth \$250 at retail for less than \$5 per month over 24 months;
2 with installation, the cost would be closer to \$10 per month. (McCormick, p.20)

3 The Data Analytics reports and website access will be provided to “a cross section
4 of PSE&G’s single family residential customer class, including low income customers,”
5 free of charge. (McCormick, p.24)

6
7 **IV. PSE&G Cost-Benefit Analysis**

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

10 A. Yes. The Company submitted a cost-benefit analysis (“CBA”) that was prepared by its
11 consultant, Gabel and Associates. A summary of the CBA was provided as Schedule
12 MCM-EE17-11, sponsored by PSE&G witness M. Courtney McCormick. The Company
13 also filed workpapers in support of its CBA, including a workbook entitled “WP-MCM-
14 EE17-1.xlsx”, which contains the overall analysis and implementation of its cost-
15 effectiveness tests.

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

18 A. Schedule MCM-EE17-11 presents results for the Total Resource Cost (“TRC”) test, the
19 Participant Cost Test (“PCT”), the Program Administrator Cost (“PAC”) test, the
20 Ratepayer Impact Measure (“RIM”) test, and the Societal Cost Test (“SCT”). These are
21 five industry-standard tests that are widely used throughout the United States to test cost-

1 effectiveness of energy efficiency programs from a variety of perspectives, as will be
2 described below. Practitioners generally rely on a common reference known as the
3 California Standard Practice Manual (“CPSM”)² for standard definitions of these tests.
4 According to the Company’s response to Discovery Request RCR-EE-0014(b), Gabel
5 Associates was instructed to apply test formulas from this reference source.

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

8 A. Based on my analysis, only the PCT was applied correctly. The TRC, PAC, RIM and
9 SCT tests all contained significant errors that lead to grossly misleading results, as I will
10 describe below.

11 a. Errors in the TRC Test

12 **Q. PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE TOTAL**
13 **RESOURCE COST TEST (TRC)**

14 A. According the CSPM (p.18), “The Total Resource Cost Test measures the net costs of a
15 demand-side management program as a resource option based on the total costs of the
16 program, including both the participants' and the utility's costs.” This means that the
17 “cost” side of this test includes all administrative and implementation costs of an Energy
18 Efficiency (EE) measure, regardless of who pays. It does not consider transfer payments
19 among the parties, such as rebates, loans, or loan repayments, because these are financial
20 transactions that are independent of the actual cost of implementing the measure.

² <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=7741>.

1 On the benefit side, the TRC counts all avoided costs for the utility valued at
2 marginal cost, such as avoided energy, capacity, transmission and distribution, and
3 ancillary service costs, that would have been incurred by the utility but for the EE
4 measure.

5 **Q. DID PSE&G OR GABEL ASSOCIATES PROVIDE A FORMULA TO DESCRIBE**
6 **ITS UNDERSTANDING OF THE TRC TEST?**

7 A. Yes. In the document “RCR-EE_0014_Overview of Gabel Methods Employed for EE
8 2017 Program - 3.14.17.docx” (Attachment EDH-3), page 12, Gabel Associates provides
9 the following formula:

10 **Total Resource Cost Test Ratio**

$$= \frac{(Avoided\ Supply\ Costs) + (Avoided\ Capacity\ Costs) + (Avoided\ T\&D\ costs)}{(Participant\ Costs) + (Program\ Admin\ Costs) + (Program\ Investment\ Costs)}$$

11 **Q. IS THIS FORMULA A REASONABLE CHARACTERIZATION OF THE TEST,**
12 **IN YOUR OPINION?**

13 A. Yes, subject to interpretation. Most importantly, the last term in the denominator must be
14 interpreted as referring specifically to program investment costs borne by the utility. If
15 so, then all the costs of implementation would be accounted for.

16 **Q. IS THIS THE FORMULA, AS YOU INTERPRET IT ABOVE, THAT PSE&G**
17 **APPLIED IN ITS CBA?**

18 A. No. As may be seen in Schedule MCM-EE17-11, the Company left Line 6 (“Lifetime
19 Program Investment Costs”) blank, as if the Company were planning to make no program
20 investments with ratepayer money other than its administrative costs for any of the

1 measures proposed. This is clearly not the case. Referring back to the formula above, the
2 CBA has neglected the third term in the denominator – costs that are covered by the
3 utility – which in the case of all of PSE&G’s programs should be the largest cost item for
4 each of the measures.

5 **Q. HAS PSE&G EXPLAINED THE OMISSION OF PROGRAM INVESTMENT**
6 **COSTS IN ITS CALCULATION OF THE TRC?**

7 A. The Company was asked about this omission in RCR-EE-15, which also requested a
8 revised CBA that included these costs. In response, the Company stated:

9 *Participant repayment costs and administrative costs are the only direct program*
10 *related costs applicable to the TRC test. The CSPM program incentives are both a*
11 *benefit to customers, and a cost to the program, and therefore cancel out in the*
12 *calculation of the TRC. The CSPM defines these costs “revenue shifts,” and considers*
13 *them as both a strength and weakness of the TRC, as discussed on page 21 of the*
14 *CSPM. A revised TRC and SCT is not necessary as there are no changes to the “cost” or*
15 *“benefit” calculations in these tests. (from Response to RCR-EE-15)*

16 **Q. DOES THIS RESOLVE YOUR CONCERNS ABOUT THE APPLICATION OF**
17 **THE TRC TEST?**

18 A. No. This general explanation of the treatment of “revenue shifts” as described in the
19 CSPM has no bearing on the Company’s programs. A “revenue shift” occurs, for
20 example, when a customer pays an extra \$400 for an energy-efficient appliance, and a
21 utility or EE provider pays an incentive of \$100 to the customer. In that case the incentive
22 does not affect the overall cost of the measure – it is still \$400 extra to increase energy
23 efficiency.

1 In the case of PSE&G’s programs, the Company initially pays for the entire cost
2 of each measure and the customer repays part of that cost as an interest-free loan. In this
3 case, the customer cost is the net present value (“NPV”) of the loan repayments, and the
4 Company’s share of the measure cost is the full initial cost, minus the NPV of customer
5 repayments. Summing these two, the customer repayments cancel out, and the total
6 measure cost is exactly equal to the Company’s initial cost.

7 PSE&G’s approach was to include the customer repayments, but to ignore the
8 larger share of the cost that would be paid through the Company’s proposed program,
9 without repayment by the customer.

10 **Q. DID PSE&G PROVIDE REVISED CBA CALCULATIONS IN IT’S PREVIOUS**
11 **FILING?**

12 A. Yes. PSE&G acknowledged that it had made an error in the originally-filed CBA in
13 support of PSE&G’s 2014 EE Extension II Filing (Docket No. E014080897), developed
14 by the Rutgers Center for Energy, Economic & Environmental Policy (“CEEEP”), in
15 response to Rate Counsel’s discovery request RCR-EE-0035 in that docket (Attachment
16 EDH-4):

17 *While CEEEP accounted for the program administration cost and the participation*
18 *cost, it did not include the program incentive cost for the purposes of the TRC test.*
19 *CEEEP agrees that the program incentive cost should also be included in the TRC test.*

20 As part of the response shown in Attachment EDH-4, PSE&G provided revised
21 TRC results for each of the Company’s subprograms correcting for this error. As far as I
22 know, the Company did not formally file a corrected CBA in the EE Extension II docket

1 prior to the stipulated settlement in that Docket. Nonetheless, omitting these costs was
2 acknowledged as an error in 2014, and corrected. It remains an error today.

3 **Q. IF THE TOTAL COSTS FOR THE COMPANY’S SUBPROGRAMS ARE NOT**
4 **INCLUDED IN THE CBA, HAVE YOU BEEN ABLE TO FIND THE CORRECT**
5 **VALUES ELSEWHERE IN THE COMPANY’S MATERIALS?**

6 A. Yes. See the workpaper WP-MCM-EE17-1, worksheet “Monthly Pro-Forma”. For each
7 of the subprograms proposed, the Company has provided a row with projected program
8 investments. Row 225 shows the projected program investments, by month, for the
9 Multifamily subprogram; row 231 for Direct Install, row 237 for Hospital and Health,
10 row 243 for Smart Thermostats, and row 249 for Data Analytics. Column E in each row
11 contains the NPV of total program investments, and this is the value that should be used
12 to represent lifetime program investments for each subprogram.

13 As noted above, these “program investments” cover the entire cost of the
14 program, other than administrative costs. The value shown in line 4 of Workpaper MCM-
15 EE17-1 may be omitted from the calculation of program investment, even though it is a
16 customer cost, because the customer is simply repaying the utility for covering the up-
17 front costs of the program. In other words, the “program investments” already include
18 both utility and participant costs. The proper denominator for the TRC equation above is
19 the NPV of administrative costs (line 5 in Workpaper MCM-EE17-1) plus the NPV of
20 program investment costs (row 225, cell “E” in the worksheet “Monthly Pro Forma”).

1 **Q. WHEN YOU REFER TO THE DENOMINATOR IN THE TRC TEST, ARE YOU**
2 **ALSO REFERRING TO TOTAL SUBPROGRAM COST?**

3 A. Yes.

4 **Q. WHAT ARE THE TOTAL PROJECTED SUBPROGRAM COSTS FOR EACH**
5 **OF THE PROPOSED SUBPROGRAMS, BOTH AS REPRESENTED IN THE**
6 **CBA AND AS CALCULATED IN THE “MONTHLY PRO-FORMA”**
7 **WORKSHEET, WHICH YOU CONCLUDE IS THE CORRECT VALUE?**

8 A. The two sets of projected subprogram costs are presented in Table 1.

TABLE 1. TOTAL PROJECTED COSTS AND GAS AND ELECTRICITY SAVINGS BY SUBPROGRAM: ORIGINAL AND CORRECTED.

	Projected Total Costs		
	Multifamily	Direct Install	Hosp & Health
<i>MCM-EE17-1</i>	\$8,906,354	\$6,146,904	\$9,534,437
<i>Corrected (Monthly Pro Forma)</i>	\$20,171,136	\$15,957,287	\$23,135,062

9 **Q. HAVE YOU FOUND OTHER EVIDENCE CORROBORATING YOUR**
10 **ASSERTION THAT THE “CORRECTED” VALUES IN TABLE 1 ARE A**
11 **BETTER REPRESENTATION OF MEASURE COSTS?**

12 A. Yes. In response to Rate Counsel data request RCR-EE-21, PSE&G provided a workbook
13 entitled “RCR-EE_0021_EEE Ext MultFam and Hosp + Ext2 DI - 2.1.2017.xlsx”
14 containing a detailed calculation of the observed savings associated with each measure.
15 This workbook also apportions the cost of each measure into costs associated with gas vs.
16 electricity savings based on the relative avoided retail cost for each fuel.

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1 Attachment to RCR-EE-21 includes a summary, reproduced below as Table 2a, of
2 the apportionment of costs into gas and electric savings; it includes a further summary of
3 the cost of saved gas (\$/therm) and saved electricity (\$/kWh) using this apportionment,
4 reproduced here as Table 2b.

TABLE 2A. ALLOCATIONS OF COSTS BETWEEN GAS AND ELECTRICITY. FROM ATTACHMENT EDH-6.

Program	Electric	Gas
MF	29%	71%
DI	95%	5%
Hosp	68%	32%

TABLE 2B. COST OF SAVED GAS (\$/THERM) AND ELECTRICITY (\$/KWH). FROM ATTACHMENT EDH-6.

Program	Electric	Gas
MF	\$ 0.062	\$ 0.431
DI	\$ 0.050	\$ 0.660
Hosp	\$ 0.066	\$ 0.554

5
6 **Q. HOW DO THE OBSERVED COSTS OF SAVED ENERGY SHOWN ABOVE**
7 **COMPARE TO THE PROJECTED COSTS OF SAVED ENERGY FOR THE**
8 **THREE EXISTING PROGRAMS, BASED ON PSE&G’S ANALYSIS AND YOUR**
9 **CORRECTED ANALYSIS?**

10 **A.** Table 3 shows the projected cost of saved energy implied by PSE&G’s analysis, and by
11 my revised analysis, compared to the observed costs from Attachment EDH-6 and shown
12 in Table 2b. The “observed costs” are those calculated using on data from the EEE
13 Extension II projects. In each case, I have apportioned the costs into electric and gas
14 costs using the percentages in Table 2a. As may be seen, my “corrected” costs are quite
15 close to the observed costs for each program, while the PSE&G costs are only a fraction
16 of the observed costs.

1 This confirms my finding that the TRC test calculation provided by the company
2 was deficient in that it significantly underrepresented the costs associated with each
3 subprogram.

TABLE 3. COMPARISON OF COST OF SAVED ENERGY (AS-FILED AND CORRECTED) VS. OBSERVED COSTS FROM ATTACHMENT EDH-6

	Cost of Saved Gas (\$/therm)			Cost of Saved electricity (\$/kWh)		
	PSE&G	Corrected	Observed	PSE&G	Corrected	Observed
Multifamily	\$ 0.192	\$ 0.435	\$ 0.431	\$ 0.028	\$ 0.062	\$ 0.062
Direct Install	\$ 0.265	\$ 0.689	\$ 0.660	\$ 0.021	\$ 0.053	\$ 0.050
Hosp & Health	\$ 0.217	\$ 0.527	\$ 0.554	\$ 0.025	\$ 0.061	\$ 0.066

4
5 **Q. HAVE YOU IDENTIFIED ANY FURTHER EVIDENCE THAT THE PSE&G’S**
6 **TRC TEST RESULTS ARE UNREALISTIC?**

7 A. Yes. I compared the observed cost of saved energy associated with the PSE&G’s existing
8 programs (“Observed” in Table 3) with the Company’s own projections of the avoidable
9 cost of electricity and gas, and found that the former is greater than the latter – that is,
10 based to the Company’s own numbers, it is clear that it costs more to save energy under
11 the company’s existing programs than it would to purchase the energy on the market.
12 This is exactly the comparison that the TRC test is designed to reveal, and the numbers
13 are completely at odds with the TRC results presented in Workpaper MCM-EE17-1.

14 **Q. PLEASE DESCRIBE THE SOURCE YOU USED FOR THE AVOIDABLE COST**
15 **OF ELECTRICITY AND GAS.**

16 A. PSE&G provided its projections of monthly avoidable electricity (on- and off-peak) and
17 gas costs in WP-MC-EE-17-1 worksheet “Monthly assumptions”. For comparison
18 purposes, I calculated the average on-peak and off-peak electricity prices and gas prices,

1 as projected by PSE&G, for all months for the years 2018 through 2020, inclusive. (This
2 time period is somewhat arbitrary, but any relevant time period would have yielded
3 similar results.) The results are shown in Table 4.

TABLE 4. PSE&G-PROJECTED AVOIDABLE COST. FROM ATTACHMENT EDH-2.

Average PSE&G Projected Monthly Avoidable Cost, 2018-2020	
Natural Gas (\$/therm)	\$ 0.417
Electricity On-Peak (\$/kWh)	\$ 0.042
Electricity Off-Peak (\$/kWh)	\$ 0.029

4 **Q. WHAT CAN YOU CONCLUDE FROM A COMPARISON OF THESE**
5 **AVOIDABLE COSTS TO THE VALUES FOR COST OF SAVED ENERGY**
6 **SHOWN IN TABLE 3?**

7 A. Because the corrected costs of saved gas and electricity are greater than the avoided costs
8 of gas and electricity for the three existing subprograms, these three subprograms will not
9 pass the TRC test if properly calculated.

10 **Q HAVE YOU RECALCULATED THE TRC TEST FOR PSE&G’S PROPOSED**
11 **PROGRAMS, USING YOUR CORRECTED APPROACH?**

12 A. Yes. The original (Attachment MCM-EE17-1) and corrected TRC results are shown in
13 Table 5.

TABLE 5. AS-FILED AND CORRECTED TOTAL RESOURCE COST TEST BENEFIT/COST RATIO RESULTS.

	MULTIFAMILY	DIRECT INSTALL	HOSP & HEALTH	SMART THERMOSTAT	DATA ANALYTICS
MCM-EE17-1	1.83	2.22	1.68	2.92	3.36
CORRECTED	0.81	0.85	0.69	1.72	1.30

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Q. WHAT IS YOUR CONCLUSION, BASED ON THE ANALYSIS SUMMARIZED IN TABLE 5, REGARDING THE PERFORMANCE OF PSE&G’S PROPOSED PROGRAMS UNDER THE TRC TEST?

A. PSE&G’s three existing subprograms – the Multifamily, Direct Install, and Hospital subprograms, do not pass the threshold ratio of 1.0 under the properly calculated TRC. This is consistent with expectation, given that the cost of saved energy for these programs is greater than the avoidable costs. From the perspective of this test, those three programs are not cost effective. The two new programs, Smart Thermostats and Data Analytics, do appear to be cost effective under the TRC, based on the Company’s assumptions.

Q. DO YOU HAVE ANY CAVEATS FOR THIS CONCLUSION?

A. Yes. It appears from the Company’s workpapers that PSE&G is using the full cost of each measure in performing its CBA, rather than the “incremental” cost. In some cases, for example when a customer would have soon replaced equipment even without a utility incentive, the proper cost to be associated with energy efficiency is the incremental cost of either replacing the equipment earlier, or choosing a more efficient option, or both. In some cases this can be far lower than the full cost of the equipment.

Q. WHAT ARE THE IMPLICATIONS OF THIS CORRECTION FOR INTERPRETATION OF THE CURRENT CBA?

A. Using the Company’s approach of considering full measure cost leads to the conclusion that the existing programs are not cost effective from a TRC perspective. However, were PSE&G to determine and incorporate the true incremental cost of its measures, a fuller

1 and more accurate picture of cost-effectiveness for each of the subprograms would
2 emerge.

3 This approach also obscures a certain amount of free-ridership under the
4 Company's programs. If customers are including upgrades and replacement of outdated
5 equipment under the program that would have been required regardless of PSE&G's
6 programs, much of the cost of these replacements may have nothing to do with achieving
7 greater energy efficiency. By failing to consider the portion of its measure cost that is
8 actually associated with energy savings, the Company impairs cost-effectiveness and may
9 be shifting inappropriate costs onto other ratepayers.

b. Errors in the PAC Test

10
11 **Q. WHAT IS THE PURPOSE OF THE PROGRAM ADMINISTRATOR COST**
12 **TEST?**

13 A. The PAC test compares costs and benefits from the utility's perspective – that is, it
14 considers the stream of costs and revenues seen by the utility, on an NPV basis. Any
15 costs borne or benefits received by other parties, such as the participant or other
16 ratepayers, are irrelevant to this test.

17 **Q. WHAT WAS THE COMPANY'S ERROR IN APPLICATION OF THE PAC**
18 **TEST, AND WHAT ARE THE TEST RESULTS FOR THIS TEST WHEN THIS**
19 **ERROR IS CORRECTED?**

20 A. Because the cost side of the PAC test considers the stream of net costs from the utility's
21 perspective, it includes any payments made by the utility as a positive cost, and any
22 revenue received, such as a loan repayment from a participant, is a negative cost from the

1 utility’s perspective. However, instead of considering actual customer repayments,
2 PSE&G instead erroneously netted out of its own payments any amount that would be
3 repaid by the participant, but at a later date. This introduces an error into the cost
4 calculation because it ignores the time value of money.

5 The original and corrected results for the PAC test are shown in Table 6.

TABLE 6. AS-FILED AND CORRECTED PROGRAM ADMINISTRATOR TEST BENEFIT/COST RATIO RESULTS

	MULTIFAMILY	DIRECT INSTALL	HOSP & HEALTH	SMART THERMOSTAT	DATA ANALYTICS
MCM-EE17-1	1.26	1.14	1.12	2.50	1.30
CORRECTED	1.16	1.11	1.03	2.44	1.30

6
7 **Q. HAS THE COMPANY EXPLAINED ITS APPROACH TO THE PROGRAM**
8 **ADMINISTRATOR COST TEST?**

9 A. The Company was asked about this omission in RCR-EE-16, which also requested a
10 revised CBA that included these costs. In response, the Company stated, in part:

11 *Based on the rate treatment of the regulatory assets in the sub-programs, PSE&G is*
12 *not collecting carrying charges and is therefore not neglecting to include them. By*
13 *using the “Portion of Investment to be Repaid” in lieu of the “Program Investment*
14 *Repayments,” the Company is implementing a conservative methodology to calculate*
15 *the PAC as the “Program Investment repayments” are stretched out over a longer*
16 *time period and would result in a lower relative NPV cost. (Response to RCR-EE-16)*

17 **Q. DOES THIS EXPLANATION RESOLVE YOUR CONCERNS ABOUT PSE&G’S**
18 **APPLICATION OF THE PAC TEST?**

19 A. No. It is exactly my point that the Company is not collecting carrying charges from its
20 customers; thus these charges are borne initially by the Company ultimately by its
21 ratepayers, and should be included as costs in the Program Administrator Cost test.

1 Furthermore, the Company admits that this approach results in a reduction in the net
2 present value (“NVP”) cost. Artificially reducing costs is not “a conservative
3 methodology” in the context of a cost-benefit analysis.

4 c. Errors in the RIM Test

5 **Q. TURNING NOW TO THE RATEPAYER IMPACT MEASURE TEST, WHAT IS**
6 **THE PURPOSE OF THIS TEST?**

7 A. The RIM test measures the impact of energy efficiency programs on ratepayers as a
8 whole, by measuring the impact on the utility’s revenue requirements. Properly applied,
9 the RIM test includes an estimate of *all* reduced revenues to the utility on the cost side –
10 this is primarily the lost sales of electricity and gas to customers that are engaged in
11 energy efficiency measures, accounted at the full retail cost. The benefit side is any
12 savings associated with avoided gas, electric energy and capacity, and ancillary service
13 purchases including reserves.

14 Because the “costs” in the RIM test are lost sales accounted at retail cost, but are
15 compared to benefits accounted at wholesale cost, energy efficiency measures generally
16 do not have benefit/cost ratios greater than 1 under this test. This is often rationalized
17 because ratepayers may choose whether to participate in EE programs or not, so in effect
18 the additional cost is avoidable by simply implementing EE measures, whether by
19 participating in a utility program or by acting independently.

1 **Q. WHAT WAS THE PSE&G’S ERROR IN APPLICATION OF THE RATEPAYER**
2 **IMPACT MEASURE TEST, AND WHAT ARE THE TEST RESULTS FOR THIS**
3 **TEST WHEN THIS ERROR IS CORRECTED?**

4 A. The Company’s cost calculation for this test was quite complicated, but the bottom line is
5 that it included only a very small part of the retail sales – just the part of its
6 “administrative allowance” incremental to its projected administrative costs – and omits
7 any estimate of the vast bulk of forgone revenues. This omission explains the anomalous
8 and unusual high scores the Company reported for this test. The original and corrected
9 results for the RIM test are shown in Table 7.

TABLE 7. AS-FILED AND CORRECTED RATEPAYER IMPACT MEASURE TEST BENEFIT/COST RATIO RESULTS

	MULTIFAMILY	DIRECT INSTALL	HOSP & HEALTH	SMART THERMOSTAT	DATA ANALYTICS
MCM-EE17-1	1.22	1.07	1.10	1.89	0.91
CORRECTED	0.43	0.34	0.38	0.47	0.36

10
11 **Q. ARE THE CORRECTED RIM TEST RESULTS CLOSER TO WHAT YOU**
12 **WOULD EXPECT FOR A WELL-DESIGNED ENERGY EFFICIENCY**
13 **PROGRAM?**

14 A. No. The corrected scores are quite low relative to what I would expect and what I have
15 seen from RIM test results in New Jersey and elsewhere, suggesting that ratepayers in
16 general are overpaying for these programs. These scores, combined with the very high
17 Participant Cost Test scores reported by Ms. McCormick in Schedule MCM-EE17-11,
18 make the reason clear: PSE&G offers extremely high incentives to its customers, making
19 the proposed subprograms extremely attractive to participants but unduly expensive to

1 ratepayers in general. This is also evidenced in the high demand the company has for
2 participation in each of its programs, discussed earlier in my testimony.

d. Errors in the SCT Test

3
4 **Q. TURNING NOW TO THE SOCIETAL COST TEST, WHAT IS THE PURPOSE**
5 **OF THIS TEST?**

6 A. The SCT is similar to the TRC Test, except that the “benefits” side of the equation
7 includes certain additional benefits, such as avoided emissions and emissions costs. The
8 purpose of this test is to recognize that certain benefits are not readily quantified in
9 traditional utility terms of avoided costs and changes in revenues, so the Company is
10 expected to find a reasonable and credible way of including these costs in its analysis.

11 **Q. WHAT WAS THE COMPANY’S ERROR IN APPLICATION OF THE**
12 **SOCIETAL COST TEST, AND WHAT ARE THE TEST RESULTS FOR THIS**
13 **TEST WHEN THIS ERROR IS CORRECTED?**

14 A. The “cost” side of the SCT is identical to that of the TRC test, and the Company’s error
15 was the same as that described above for the TRC test. The original and corrected results
16 for the SCT test are shown in Table 7.

*Direct Testimony of Ezra D. Hausman, Ph.D.
Public Service Electric and Gas Company – EE 2017 Program
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TABLE 8. AS-FILED AND CORRECTED SOCIETAL COST TEST BENEFIT/COST RATIO RESULTS.

	MULTIFAMILY	DIRECT INSTALL	HOSP & HEALTH	SMART THERMOSTAT	DATA ANALYTICS
MCM-EE17-1	2.44	3.52	2.44	3.84	4.81
CORRECTED	1.08	1.36	1.00	2.26	1.87

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Q. WHAT ARE THE IMPLICATIONS OF THIS SCT TEST CORRECTION FOR EVALUATION OF THE COMPANY’S SUBPROGRAMS?

A. While the corrected SCT scores are much lower than those presented by PSE&G in MCM-EE17-1, they do equal or exceed the threshold value of 1.0 for each of the Company’s proposed subprograms. In addition, there are benefits, such as the job-creation benefits described in the New Jersey Master Plan, that are incremental to the benefits included in this test. This suggests that the proposed programs present a net benefit to society in New Jersey, as defined in the New Jersey Energy Master Plan, even if they are not cost effective on a Total Resource Cost basis.

e. General Conclusions on Cost-Effectiveness

Q. WHAT ARE YOUR OVERALL CONCLUSIONS BASED ON THE CORRECTED COST-BENEFIT ANALYSIS RESULTS?

A. My overall revised CBA results are presented in Appendix B, which follows the form of Attachment MCM-EE17-1 but presents corrected calculations and results.

In contrast to the results presented by the Company in Attachment MCM-EE17-1, I find that the three existing programs are not cost effective from the perspective of the TRC test, and they score dramatically poorly on the RIM test. They do appear to be cost-effective from the perspectives of the PCT test, the PAC test, and the SCT test.

1 The poor showings for the existing subprograms on the TRC and RIM tests
2 should be of concern to the utility and to the Board, because it means that these
3 subprograms are unduly costly to implement: first, that many of the underlying measures
4 themselves are more costly than the value of the energy saved (TRC test) and second, that
5 ratepayers carry too high a burden in subsidizing overly generous incentives for program
6 participants (RIM test). Because they do pass both the PCT and the PAC tests (each of
7 which only considers a part of the total cost) it is possible to conclude that the
8 subprograms are still preferable for the utility over procuring additional supplies, and of
9 course the high incentive levels make them very attractive to the participants.

10 The cost effectiveness of these subprograms could be improved with certain
11 modifications to the programs.

12 **Q. HOW COULD PSE&G’S PROGRAMS BE IMPROVED SO THAT THE**
13 **BENEFITS ARE MORE WIDELY SHARED BY ALL RATEPAYERS?**

14 A. First, PSE&G should reduce its incentive levels so that there is a better balance between
15 participant and ratepayer costs. There is ample room to reduce incentives and still offer
16 programs that are very beneficial and attractive to participants. Lowering incentives
17 would improve RIM test cost-effectiveness scores by making each individual project less
18 costly to ratepayers. This would also allow more customers to participate for the same
19 budget, all else equal, reducing waiting lists and producing more savings for the ratepayer
20 dollar. With more balanced incentives, the programs would yield higher benefits and
21 share those benefits across a wider cross-section of PSE&G’s ratepayers.

1 **Q. FINALLY, DO YOU HAVE ANY SUGGESTIONS FOR HOW PSE&G'S**
2 **PROGRAMS SHOULD BE MODIFIED TO IMPROVE COST-EFFECTIVENESS**
3 **FROM A TRC PERSPECTIVE?**

4 A. Yes, based on PSE&G's observed cost workbook to RCR-EE-21 which includes measure-
5 by-measure costs and savings from each of the Company's existing programs. As may be
6 expected, some measures are more cost-effective than others, and the program
7 implementation could be modified to focus more on the cost-effective measures. There
8 are even numerous examples for the Multifamily and Hospital subprograms of measures
9 that *increased* energy use, yet were paid for by the Company at ratepayer expense.
10 PSE&G and/or its contractors should screen the measures included in its customized
11 programs more carefully to ensure that ratepayer money is actually being spent on energy
12 efficiency, rather than subsidizing other projects which increase energy use.

13 However, there is a significant trade-off at play: eliminating the more marginal
14 measures runs the risk of so-called "cherry-picking", i.e., of missing one-time
15 opportunities to install numerous energy-saving measures that are only available under
16 the Company's whole-building or whole-facility approach. A well-designed EE program
17 can reasonably include such measures as long as the overall program is cost-effective and
18 provides net benefits for ratepayers and for the State. This sort of fine-tuning is a crucial
19 part of program design and planning, but it can only be done with good data (including
20 measure incremental cost) and proper analysis. PSE&G's program as filed fails on both
21 of these fronts.

1 **V. Protection and Use of Customer Data**

2 **Q. TURNING NOW TO THE ISSUE OF CUSTOMER DATA, WHAT ARE YOUR**
3 **GENERAL CONCERNS ABOUT PSE&G’S COLLECTION AND USE OF**
4 **CUSTOMER DATA?**

5 A. PSE&G’s two new proposed subprograms, the Smart Thermostats and Data Analytics
6 subprograms, involve or could potentially involve the collection, analysis, and use of
7 customer energy usage data. The Company is also relying on third-party contractors for
8 some elements of these programs, meaning that third parties may have access to customer
9 energy use data in addition to personal data, such as names and addresses. All of this data
10 may have commercial value, so it is appropriate to address privacy issues and ask how
11 the Company might exploit that commercial value and who would get the benefit of any
12 financial transactions relating to aggregate customer data. Finally, the Smart Thermostats
13 program could eventually allow PSE&G to control equipment inside customer homes and
14 other establishments.

15 These programs promise very significant financial and energy-saving benefits to
16 customers. However, this does not negate the fact that customers should not be required
17 to relinquish control of their personal data or energy use without permission and without
18 full knowledge of how and it going to be used and by whom.

19 **Q. DOES PSE&G HAVE A WRITTEN POLICY ON DATA PRIVACY ISSUES**
20 **THAT IS APPLICABLE TO THESE PROGRAMS?**

21 A. In response to Rate Counsel Discovery Request RCR-EE-11(b), PSE&G stated:

1 *PSE&G has not prepared a privacy policy with regard to the customer data to be*
2 *collected with respect to this program segment. It anticipates remaining consistent*
3 *with all applicable statutes and Board regulations governing customer information...*
4 *it is also anticipated that information the Company receives will be shared in some*
5 *form with [Board Staff and Rate Counsel], presumably with all appropriate consents*
6 *received from customer participants consistent with Board regulations.*

7 In response to part (c) of the same data request, the Company stated that:

8 *PSE&G will not make customer information available to affiliates or third parties for*
9 *commercial or marketing purposes. PSE&G may utilize aggregate Smart Thermostat*
10 *and Data Analytics Sub Program information to cross promote other Board-approved*
11 *PSE&G programs and regulated utility services such as energy savings opportunities*
12 *and customer service options (e.g., equal payment plan, other energy efficiency*
13 *programs, billing alerts, etc.)*

14 However, these are mere statements of the Company’s current position regarding
15 data privacy and use, and does not constitute a clearly articulated commitment on which
16 customers can rely.

17 **Q. WHAT ARE PSE&G’S PLANS FOR ASSUMING CONTROL OF CUSTOMER**
18 **THERMOSTATS?**

19 A. In response to part (d) of the same request, PS&G stated that “PSE&G has no plans to
20 assume control of the smart thermostats on customer premises.” Once again, this falls far
21 short of an ironclad commitment. Further, PSE&G witness McCormick defined Smart
22 Thermostats in her testimony as “a programmable thermostat with two-way
23 communication capability and behavioral ‘intelligence’ that can provide energy savings
24 to customers. For residential customers, the smart thermostat has the ability to auto-
25 program itself to maximize energy savings while not compromising the customer’s
26 comfort level.” (McCormick Direct Testimony, p.13)

1 **Q. WHAT WOULD BE AN APPROPRIATE WAY TO MANAGE THIS ISSUE?**

2 A. Customers deserve a clearer understanding of how their data will be collected and used,
3 and any extent to which they will cede control of their energy use and comfort, prior to
4 enrolling in this program. PSE&G should be directed to produce a clear and accessible
5 policy on data privacy and use, including its plans to obtain affirmative customer consent,
6 before it begins enrolling customers in these two new subprograms. This plan should be
7 in compliance with the applicable statutes and regulations governing customer
8 information.³

9 **VI. Recommendations**

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

11 A. I make the following recommendations:

- 12 • The Company should be required to reduce certain of its customer incentive levels
13 as recommended herein, such that the benefits of energy efficiency can be shared
14 more equitably between participants and the captive nonparticipant ratepayers
15 who nonetheless help to fund the program.
- 16 • The Company should be directed to propose modifications to its programs to
17 improve cost-effectiveness overall, in part by screening its customized
18 subprograms for specific certain measures to exclude those for which the cost is
19 far in excess of the energy savings.
- 20 • The Company should be directed to develop and publish a comprehensive
21 customer data use and privacy policy prior to implementing its Smart Thermostat
22 and Data Analytics Subprograms consistent with applicable law. This policy

³ See N.J.A.C. 14:4-7.8, 14:4-2.3 and 14:4-2.4 for example.

1 should address how the Company collects, stores, aggregates, uses internally, and
2 releases customer data. It should also address data security issues, and any future
3 sales or sharing of aggregate data with third parties, including ownership and
4 revenue-sharing issues pertaining to any financial benefit received by PSE&G
5 from the sale or use of the data. The proposed policy should be clear, consistent,
6 and available for public review, and should be subject to Board approval.

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

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

10 .

Appendix A: Revised CBA Analysis Results Summary

Results		Multifamily	Direct Install	Hosp & Health	Smart Thermostat	Data Analytics	
Total Resource Cost Test (TRC)							
1	Lifetime Avoided Supply Costs	<i>PV of bill reduction at wholesale</i>	\$ 15,289,924	\$ 11,127,923	\$ 13,468,090	\$ 22,035,930	\$ 4,029,754
2	Lifetime Capacity Costs	<i>PV of peak electric capacity cost</i>	\$ 805,504	\$ 1,909,957	\$ 1,992,028	\$ 1,795,262	\$ 579,877
3	Lifetime Avoided T&D Costs	<i>PV of avoided T&D</i>	\$ 241,987	\$ 589,724	\$ 564,468	\$ 676,592	\$ 266,528
	Total Benefit	1+2+3	\$ 16,337,415	\$ 13,627,603	\$ 16,024,586	\$ 24,507,785	\$ 4,876,159
4	Lifetime Participant Costs	<i>PV of repayments by participants</i>	\$ 6,054,256	\$ 3,663,913	\$ 7,626,923	\$ 4,227,641	\$ -
5	Lifetime Administration Costs	<i>PV of admin costs</i>	\$ 2,852,098	\$ 2,482,992	\$ 1,907,514	\$ 4,158,547	\$ 1,452,356
6	Lifetime Program Investment Costs	<i>PV of Program Investments</i>	\$ 17,319,038	\$ 13,474,295	\$ 21,227,548	\$ 10,112,128	\$ 2,287,911
	Total Costs	5+6	\$ 20,171,136	\$ 15,957,287	\$ 23,135,062	\$ 14,270,675	\$ 3,740,268
	Benefit-Cost Ratio	(1+2+3)/(5+6)	0.81	0.85	0.69	1.72	1.30
Participant Cost Test (PCT)							
7	Lifetime Participant Benefits	<i>PV of bill reduction at retail</i>	\$ 24,218,930	\$ 28,055,222	\$ 26,656,015	\$ 42,310,394	\$ 9,887,703
	Benefit-Cost Ratio	7/4	4.00	7.66	3.49	10.01	n/a
Program Administrator Cost Test (PAC)							
8	Lifetime Program Incentive Costs	<i>PV of incentives</i>	\$ 10,080,129	\$ 9,432,007	\$ 12,349,763	\$ 5,631,284	\$ 2,287,911
	Benefit-Cost Ratio	(1+2+3)/(5+6-4)	1.16	1.11	1.03	2.44	1.30
Ratepayer Impact Measure Test (RIM)							
9	Lifetime Utility Revenue Gained		\$ -	\$ -	\$ -	\$ -	\$ -
10	Lifetime Utility Cost	<i>PV of bill reduction at retail (for T&D costs only)</i>	\$ 512,342	\$ 826,247	\$ 274,688	\$ 3,198,552	\$ 1,625,770
	Benefit-Cost Ratio	(1+2+3+9)/(5+6+7-4)	0.43	0.34	0.38	0.47	0.36
Societal Cost Test (SCT)							
11	Lifetime Emission Savings	<i>PV of CO₂ + Nox + SO₂ emissions savings</i>	\$ 5,385,840	\$ 7,995,133	\$ 7,216,834	\$ 7,721,813	\$ 2,113,648
	Benefit-Cost Ratio	(1+2+3+11)/(5+6)	1.08	1.36	1.00	2.26	1.87