

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

**IN THE MATTER OF THE PETITION OF NEW)
JERSEY NATURAL GAS COMPANY FOR)
APPROVAL OF ENERGY EFFICIENCY) BPU DOCKET NOs.
PROGRAMS AND THE ASSOCIATED COST) QO19010040 and GO20090622
RECOVERY MECHANISM PURSUANT TO THE)
CLEAN ENERGY ACT, N.J.S.A. 48:3-87.8 et seq. and)
48:3-98.1 et seq.**

**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 have over two decades of experience as a consulting analyst and expert in energy and
8 environmental areas, including: state and regional energy, capacity, and transmission
9 planning, including both utility resource planning and long-term (multi-decadal) climate-
10 constrained resource planning; regulatory and ratemaking proceedings; electricity and
11 generating capacity market design and analysis; electric system dispatch modeling;
12 economic analysis of environmental and other regulations, including greenhouse gas
13 regulation, in energy markets; economic analysis, price forecasting, and asset valuation;
14 quantification of the economic and environmental benefits of displaced emissions; energy
15 efficiency and renewable energy programs and policies; and regulation and mitigation of
16 greenhouse gas emissions. I have extensive experience with market simulation,
17 production cost modeling, and resource planning methodologies and software.

18 I have provided testimony before public utility commissions or legislative
19 committees in Arizona, Florida, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland,
20 Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey,
21 New York, North Carolina, Oregon, Pennsylvania, South Carolina, South Dakota, Utah,

1 Vermont, Virginia, Washington, DC, and Washington State, as well as at the Federal
2 level. I have provided expert representation for stakeholders at the PJM RTO, the
3 California ISO, the Midcontinent ISO, and at the Federal Energy Regulatory Commission
4 (“FERC”). While most of my testimony and analytical work has centered on issues in
5 energy market economics, I have also brought my expertise as a scientist to bear on cases
6 involving greenhouse gas regulation and mitigation in the United States.

7 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 provided a
10 detailed resume as Schedule EDH-1.

11 **Q. Have you previously testified before the New Jersey Board of Public Utilities**
12 **(“BPU”, or “Board”)?**

13 A. Yes. I submitted prefiled written testimony on behalf of the New Jersey Division of Rate
14 Counsel (“Rate Counsel”) in response to the petition of Atlantic City Electric Company
15 for approval of a voluntary program for plug-in vehicle charging (BPU Docket No.
16 EO18020190) on September 2nd of this year, and in response to Public Service Electric
17 and Gas Company’s (“PSE&G”) petition for approval of its proposed Clean Energy
18 Future – Electric Vehicles and Energy Storage program (BPU Docket No. EO18101111
19 on September 4. I also filed written testimony on behalf of Rate Counsel in the most
20 recent energy efficiency program (“EE 2017”) filing by PSE&G (BPU Docket No.
21 EO17030196); in PSE&G’s 2018 CEF-EE filing (BPU Docket No. GO18101112 &

1 EO18101113); and in Rockland Electric’s low income/energy efficiency filing (BPU
2 Docket No. ER17080869). I have also participated in numerous Board-sponsored
3 stakeholder processes on behalf of Rate Counsel, and I have supported Rate Counsel’s
4 review of several utility filings that were resolved through settlement prior to submittal of
5 intervener testimony.

6 **Q. What is the purpose of your testimony in this proceeding?**

7 A. The purpose of my testimony is to address the petition by New Jersey Natural Gas
8 Company (“NJNG”) to implement energy efficiency programs, with associated cost
9 recovery, pursuant to the Clean Energy Act (“CEA”). I reviewed NJNG’s proposal in the
10 context of recent clean energy legislation in New Jersey,¹ relevant Board orders,² and the
11 ongoing process through the Utility Working Group (“UWG”) to establish consistent
12 programs and procedures pursuant to the CEA. I have also reviewed the Order accepting
13 the Stipulation of Settlement in BPU Docket. Nos. GO18101112 and EO18101113,³
14 which set the terms of the first energy efficiency programs under the CEA to have been
15 approved by the Board.

16 In my testimony, I review the design of NJNG’s programs and evaluate whether
17 they meet the standards set forth by the Board in its relevant orders, and whether they are

¹ Specifically, the NJ Clean Energy Act of 2018 (P.L. 2018, c. 17; N.J.S.A. 48:3-87.8 et al.). Hereinafter “CEA” or the “Act”.

² Specifically, I/M/O Implementation of the CEA, BPU Dkt. Nos. QO19060748, QO19010040, and QO17091004 (Order, June 10, 2020), hereinafter “CEA Order”, and I/M/O Implementation of the CEA - NJ Cost Test , BPU Dkt. Nos. QO19010040 and QO20060389 (Order, August 24, 2020), hereinafter “NJCT Order”.

³ I/M/O PSE&G CEFEE, BPU Dkt. Nos. GO18101112 and EO18101113 (Order, September 23, 2020).

1 in the public interest. Finally, I raise certain issues related to the cost-benefit and cost-to-
2 achieve analyses provided in support of the Company’s proposed programs.

3 **Q. What information have you reviewed in preparation of this testimony?**

4 A. I have reviewed the Company’s Petition, supporting testimony, workpapers, and
5 discovery responses provided pursuant to questions propounded by Rate Counsel and
6 other parties. I also reviewed the Board orders referenced above, along with the
7 Demographic Study⁴ produced pursuant to the CEA and the CEA Order, and the Energy
8 Efficiency Potential Study⁵ prepared pursuant to the CEA.

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

10 **Q. What are your recommendations to the Board?**

11 A. I recommend that the Board approve the Company’s proposed core and utility-led
12 programs, with the exception of its proposed Hybrid Heat Pilot Program, and subject to
13 the same caveats as in the PSE&G case. The Board should also make clear that while a
14 certain amount of leeway may be appropriate during this transitional period, more
15 rigorous, consistent, and transparent cost-benefit analysis will be required for all future
16 EE filings.

⁴ DNV-GL, “Utility Demographic and Firmographic Profile 2020,” dated April 3rd 2020, produced pursuant to P.L. 2018, c. 17, codified at N.J.S.A. 48:3-51-87 et seq. and the CEA Order.

⁵ Optimal Energy, “Energy Efficiency Potential in New Jersey,” dated May 24, 2019.

1 **III. Regulatory Framework**

2 **Q. Please briefly describe the current regulatory framework for Energy Efficiency**
3 **(“EE”) programs in New Jersey.**

4 A. Many of New Jersey’s gas and electric utilities, including NJNG, have been offering EE
5 and Demand Response (“DR”) programs since the passage of the so-called “RGGI Act”
6 of 2008.⁶ NJNG in particular has offered programs through its SAVEGREEN filings in
7 BPU Docket Nos. EO09010056 and GO09010057, GO10030225, GR11070425,
8 GO12070640 and GR12070641, and GO14121412.⁷ These programs have been offered
9 in coordination with programs offered by the BPU’s Division of Clean Energy (“DCE”),
10 such that a full range of statewide and utility-specific programs would serve a wide range
11 of energy efficiency needs and opportunities.

12 The passage of the CEA in 2018 ushered in a significant ramp-up and

⁶ P.L. 2007, c. 340; See N.J.S.A. 48:3-98.1(a)(1).

⁷ In re Energy Efficiency Programs and Associated Cost Recovery Mechanisms and I/M/O the Petition of New Jersey Natural Gas Company for Approval of Energy Efficiency Programs with an Associated Cost Recovery Mechanism, BPU Docket Nos. EO09010056 and GO09010057 (Order, dated July 17, 2009); In re the Petition of New Jersey Natural Gas for Approval of Regional Greenhouse Gas Initiative Programs and Associated Cost Recovery Mechanisms Pursuant to N.J.S.A. 48:3-98.1, BPU Docket No. GO10030225 (Order, dated September 24, 2010); In re the Petition of New Jersey Natural Gas for Approval of Regional Greenhouse Gas Initiative Programs and Associated Cost Recovery Mechanisms Pursuant to N.J.S.A. 48:3-98.1, BPU Docket No. GR11070425 (Order, dated January 19, 2012); In re the Petition of New Jersey Natural Gas Company for Approval of the Extension of Energy Efficiency Programs and the Associated Cost Recovery Mechanism Pursuant to N.J.S.A. 48:3-98.1 and In re the Petition of New Jersey Natural Gas Company for Approval of the Cost Recovery Associated with Energy Efficiency Program, BPU Docket Nos. GO12070640 and GR12070641 (Order, dated June 21, 2013); In re the Petition of New Jersey Natural Gas Company for Approval of the Extension of Energy Efficiency Programs and the Associated Cost Recovery Mechanism Pursuant to N.J.S.A. 48:3-98.1, BPU Docket No. GO14121412 (Order, dated July 23, 2015); In re the Petition of New Jersey Natural Gas Company for Approval of the Extension of Energy-Efficiency Programs and the Associated Cost Recovery Mechanism Pursuant to N.J.S.A. 48:3-98.1, BPU Docket No. GO14121412 (Order, dated June 29, 2016).

1 reorganization of EE offerings in the State. For the first time, utilities are required not
2 only to offer a full suite of EE programs, but also to achieve newly designated
3 benchmarks for gas and electric energy savings. The utilities are also required to offer a
4 set of “core” programs that replace the programs currently offered by the State Clean
5 Energy Program, and to coordinate amongst themselves on various elements of program
6 design, evaluation, reporting, marketing, workforce training, and contracting.

7 The CEA Order tasked existing and new working groups to achieve various
8 aspects of this coordination.⁸ These are the existing Utility Working Group (“UWG”) and
9 the Energy Efficiency Advisory Group (“EEAG”), and the newly formed Workforce
10 Development Working Group, the Equity Working Group, the Evaluation, Measurement
11 and Verification (“EM&V”) Working Group, and the Marketing Working Group. The
12 Transition Working Group has since been added to coordinate aspects of the transition of
13 certain programs from State to utility management.

14 A special challenge identified by Board Staff is that New Jersey customers are
15 often served by different utilities for their gas and electric energy service, and these
16 utilities have service territories that overlap but are not coincident. In these cases, the
17 Board directed that “the utilities shall design a program structure that results in
18 coordinated, consistent delivery of programs among all of the utilities and allocates costs

⁸ CEA Order, pp. 35-37.

1 and energy savings appropriately based on the fuel type(s) treated by EE measures.”⁹ The
2 Order suggested that the utilities hire a shared, statewide coordinator to manage this
3 challenge, and as of the date of this filing, the utilities have issued a request for proposal
4 (“RFP”) to hire such an entity.

5 These working groups are still ongoing, and some, including the EM&V Working
6 Group, have not yet begun their work as of this writing. The statewide coordinator has
7 not yet been identified or hired. Elements of program design such as incentive levels are
8 still being worked out, and the implementation details for cost benefit analysis and
9 evaluation, among many other areas, have not been established. Nonetheless, all of the
10 gas and electric utilities were required to file their proposed programs for an initial three-
11 year period by September 25 of this year, for approval by May 1, 2021 and
12 implementation beginning July 1, 2021.¹⁰ These filings have all been submitted and
13 determined to be administratively complete by the Board, and they are currently being
14 litigated, essentially simultaneously.¹¹ The filing by NJNG under consideration in this
15 matter is one such filing.

16 **Q. How should the Board regard NJNG’s filing in this matter if the numerous working**
17 **groups established by the CEA Order have not completed their work, and in some**

⁹ CEA Order, page 12.

¹⁰ CEA Order, page 38.

¹¹ One utility, Public Service Electric and Gas (“PSE&G”), submitted an ambitious energy efficiency plan in October 2018. On September 23, 2020, the Board approved a stipulation of settlement in that case finding that it was “consistent with the goals of the CEA and the [Energy Master Plan].” I/M/O PSE&G CEF-EE, BPU Dkt. Nos. GO18101112 and EO18101113 (Order, September 23, 2020).

1 **cases have not even started their work, and if the Statewide Coordinator has yet to**
2 **begin work or even be identified and hired?**

3 A. The Board has no choice but to consider numerous details of the Company’s proposals to
4 be provisional and subject to change as the working groups continue their work. Further,
5 the Board must consider any analyses provided by NJNG and other utilities, including
6 cost projections, savings projections, cost-benefit analyses, and cost-to-achieve
7 projections, to be preliminary because the underlying methodologies and assumptions
8 have yet to be firmly established. The Board has set upon itself the difficult task of
9 considering these programs based on the limited information currently available. I have
10 performed my analysis to the best of my ability given the limited information and thus
11 make my recommendations to the Board accordingly.

12 **Q. As applicable, will you identify areas where information, program design, and**
13 **methodologies are incomplete in your testimony?**

14 A. Yes.

15 **Q. What are the different categories of offerings that utilities may offer under the**
16 **CEA?**

17 A. Utilities may offer both “core” and “utility-led” offerings, as well as pilot programs.

18 **Q. Please describe the difference between these categories of program offerings.**

19 A. The CEA Order designated a suite of programs to be offered by each of the New Jersey
20 utilities known as “core” programs. Core program offerings cover Residential (“Res”),
21 Commercial and Industrial (“C&I”), and Multifamily (“MF”) offerings. BPU Staff

1 outlined that the utilities “...should design core programs that assess whole building
2 structures and systems and encourage customers to consider a holistic approach to EE.”¹²
3 The utilities have interpreted the “Core programs” as programs that replace programs
4 previously managed by the State, so that these programs remain available to all customers
5 in New Jersey.

6 In addition to Core programs, Board Staff recommended that the utilities be
7 allowed to propose additional offerings that may be “developed collaboratively and filed
8 by all utilities, developed and filed individually, or piloted in individual territories and
9 eventually considered for adoption by other utilities as additional initiatives or core
10 programs to be administered by some or all utilities.”¹³ These offerings, which the
11 utilities have referred to as “utility-led” offerings, are additional to Core programs and are
12 not specifically required by the CEA. In practice, the utilities have collaborated on all of
13 the programs, and all of the New Jersey gas utilities have filed essentially the same
14 utility-led programs.

15 **Q. Are the utilities also permitted to offer pilot program offerings?**

16 A. Yes. The utilities may offer pilot programs, however, the BPU Staff encouraged
17 “consistency where possible but recognize[d] that these programs may vary by territory,
18 particularly in the short term.”¹⁴

¹² CEA Order, p. 10. par 5.

¹³ *Id.* p. 11 par. 3.

¹⁴ *Id.*

1 IV. NJNG Proposed Program Offerings

2 Q. What core programs is NJNG proposing to offer in this matter?

3 A. Table 1 lists NJNG’s proposed core program offerings, deployment goals, and budgets.

TABLE 1. NJNG PROPOSED CORE PROGRAM OFFERINGS, DEPLOYMENT LEVEL, AND BUDGET

Sector	Program	Program Description	Projected Deployment	Proposed Budget (\$M total)
Residential	Energy Efficient Products	Incentives for Efficient Products, including retail products, appliance rebates, HVAC equipment, and appliance recycling.	94,000 Products per year	\$56.8
Residential	Existing Homes - HPwES	Incentives to encourage customers to pursue comprehensive upgrades to their home.	2,181 Customers	\$29.8
Multifamily	Multifamily	Work with customers to identify efficiency projects; focus on comprehensive projects wherever possible; incentives to encourage energy efficiency investments.	2,757 Multifamily buildings	\$25.5
C&I	Direct Install	Efficiency measures and incentives for small businesses, non-profit organizations, municipalities, schools and faith-based organizations.	733 Customers	\$48.9
C&I	Prescriptive and Custom ¹⁵	Prescriptive or custom installation of high-efficiency electric and/or natural gas equipment measures and incentives for commercial and industrial customers.	3,196 Customers	\$23.7

¹⁵ The budget for the Custom and Prescriptive program is reported as \$23.7 million in Petition Exhibit P-5, Table 10. It is unclear if the Company intended to revise this budget in its updated filing of October 20th, 2020, wherein an additional cost associated with 10-year OBRP loans of \$14.9 million was shown in the Company’s revised workpaper entitled “REVISED SAVEGREEN 2020 WORKPAPERS.xlsx”. If

1 **Q. Are the core programs listed in Table 1 consistent with the core programs proposed**
2 **by other New Jersey gas utilities?**

3 A. Yes. NJNG’s offerings are essentially identical in design to the offerings proposed by
4 other New Jersey gas utilities.

5 **Q. Have the incentive levels for all of the core programs been established by the**
6 **utilities?**

7 A. Only in part. For example, for the C&I Direct Install offering, NJNG offers a proposed
8 incentive level but states that “the utilities plan to coordinate on the methodologies and
9 calculations used to determine energy savings and program incentives.”¹⁶ For this reason
10 it is hard to know how to interpret their proposed incentives, budgets, and projected
11 participation levels, which are interdependent with each other.

12 **Q. What utility led programs is NJNG proposing to offer in this matter?**

13 A. Table 2 lists NJNG’s proposed utility led program offerings, deployment goals, and
14 budgets.

so, this would bring the total program cost to \$38.6 million. I have used the budgets shown in Petition Exhibit P-5 here and throughout my testimony.

¹⁶ Petition Exhibit P-5, page 30.

TABLE 2. NJNG PROPOSED UTILITY-LED PROGRAM OFFERINGS, DEPLOYMENT LEVEL, AND BUDGET

Sector	Program	Program Description	Projected Deployment	Proposed Budget (\$M total)
Residential	Behavioral	Home energy reports and energy saving guidance	256,000 Customers	\$5.3
Residential	Quick Home Energy Check-Up (QHEC)	in-home consultation and direct installation of energy saving measures.	4,888 Customers	\$5.3
Residential	Moderate Income Weatherization	Free energy efficiency measures and upgrades for moderate income customers.	326 Customers	\$6.9
Residential	Hybrid Heat (Pilot)	Incentives for installation of heat pumps coupled with high-efficiency gas furnaces.	430 Customers	\$5.6
C&I	Engineered Solutions	Tailored energy-efficiency assistance and incentives for public service entities, such as municipalities, universities, schools, and hospitals.	137 Customers	\$43.7
C&I	Energy Management	A “holistic” approach to improving building energy performance at commercial and industrial facilities, including training and incentives.	35 Customers	\$3.3

1

2 **Q. Are the utility-led programs listed in Table 2 consistent with the utility-led**
3 **programs proposed by other New Jersey utilities?**

4 A. With the exception of the proposed hybrid heat pilot, the same programs are being
5 offered by almost all of the utilities in New Jersey.¹⁷ Even though these are not in the
6 suite of so-called core programs, the utilities developed them in close collaboration with
7 each other and produced a consistent set of offerings intended to be available statewide,

¹⁷ Rockland Electric Company has proposed a somewhat different set of programs in its CEA filing, BPU Dkt. No. EO20090623.

1 sponsored by both gas and electric utilities, with a few exceptions such as utility-specific
2 pilot programs.

3 **Q. Given that New Jersey’s utilities are developing a generally consistent set of**
4 **program offerings through a collaborative process set in motion by the Board’s**
5 **CEA Order, how much deference should the Board give the utilities in the design**
6 **and scope of those offerings?**

7 A. With respect to the core and common utility-led programs, the utilities are following the
8 process established in the CEA Order. Given this and the significant transition in the
9 State for administration of energy efficiency services in New Jersey, the Board should
10 generally let the utilities follow their ongoing process. By so doing, the utilities will work
11 out the kinks, gain better information, improve program administration, and develop best
12 program administration and delivery practices in preparation for the next triennial
13 program period and beyond. In addition to mandating annual energy saving thresholds,
14 the CEA Act and the CEA Order establish incentives and penalties to motivate the
15 utilities to meet these thresholds, at least in future years.¹⁸

16 This does not mean that the Board should give the utilities *carte blanche* for their
17 proposals, however. The Board also set forth a number of standards for cost-effectiveness
18 and cost-to-achieve savings that the utilities are required to address. If NJNG has not met

¹⁸ CEA Order page 28 and 40. The Board accepted Staff’s recommendation that “[s]ince the CEA does not mandate utility achievement of energy use reductions until after PY5...awards of incentives and assessments of penalties not begin until after the conclusion of PY5 and that these be based on year 5 performance.”

1 these standards, the Board can reasonably investigate the reasons and take action
2 accordingly. I address these standards and NJNG’s performance in meeting them later in
3 my testimony.

4 **Q. Has NJNG proposed any pilot programs that are not included in the common set of**
5 **programs proposed by all or most of the New Jersey utilities?**

6 A. Yes. It proposed a Hybrid Heat pilot program that has not been included in the other
7 utilities’ program proposals.

8 **Q. Please briefly describe the incentives proposed for this program.**

9 A. NJNG proposes to offer rebates of \$2,500, along with financing of up to \$15,000 at 0%
10 interest for seven years through an On Bill Repayment Program (“OBRP”).¹⁹

11 **Q. What is NJNG’s rationale for including this program?**

12 A. The Company states that it will help the State determine “whether larger scale
13 deployment of these types of systems can help the State cost-effectively meet long-term
14 electrification strategies without compromising customer comfort and reliability.”²⁰ The
15 Company further argues that:

16 It is critical to run this pilot during this triennial because the 2019 Energy
17 Master Plan indicates that the state is expected to consider broader
18 electrification strategies within the next few years. The existing NJCEP
19 protocols do not recognize the range of how heat pumps may be installed
20 and used by customers. It is important to assess how using them as part

¹⁹ Petition Exhibit P-5, page 61.

²⁰ Petition Exhibit P-2 page 20 at 14-16.

1 of a hybrid heat approach may be able to dramatically lower natural gas
2 heating usage and properly account for those energy savings.²¹

3 **Q. Do you have any comments on the merits of the proposed hybrid heat program?**

4 A. Yes. While I think highly efficient electric heat pumps represent an important and
5 appropriate measure to offer customers, I do not believe it makes sense to pair this
6 offering with high-efficiency gas furnaces. The Company cites the electrification
7 strategies promoted by the Energy Master Plan, but the goal of electrification is to move
8 customers away from gas, as will be necessary to meet New Jersey’s climate goals and to
9 reduce greenhouse gas emissions. It would be counterproductive to use this as a pretext
10 for encouraging additional customer investments in new gas infrastructure, such as gas
11 furnaces.

12 In addition, if customers are primarily relying on electric heat pumps, the benefits
13 of high-efficiency gas furnaces would be minimal because the furnace itself will only be
14 used for a few days per year. This element of the proposed pilot could never be cost
15 effective, because the incremental gas savings each year would be so small.

16 **Q. Does NJNG witness Baatz find the proposed Hybrid Heat program to be cost**
17 **effective?**

18 A. From a Total Resource Cost perspective it is not, showing a benefit-to-cost ratio of 0.6 by
19 Mr. Baatz’s analysis.²² Mr. Baatz does find that it is cost effective using his
20 implementation of the New Jersey Cost Test. However, the vast bulk of the benefits are

²¹ Petition Exhibit P-5, page 59.

²² Petition Exhibit BJB-2.

1 due to avoided natural gas costs, which are solely due to the installation of the electric
2 heat pump.

3 **Q. Are NJNG and other utilities, including electric utilities, offering electric heat**
4 **pumps to customers as part of their other program offerings?**

5 A. Yes.

6 **Q. Do you support this measure outside the context of the proposed Hybrid Heat**
7 **program?**

8 A. Yes. Electric heat pumps are an extremely efficient use of energy and an important
9 element of a building electrification strategy. They should be offered as an alternative to
10 gas furnaces, not paired with them.

11 **Q. Setting aside your concerns about this particular proposal, should the Board**
12 **approve pilot programs at this time?**

13 A. In my opinion, this is not the time for pilot programs. Given the extraordinary transition
14 underway in EE programming in New Jersey, all of the uncertainty in the areas under
15 consideration by the workgroups, and the need to ensure a smooth customer experience
16 with the core and common utility-led offerings, the Board should discourage additional
17 speculative investments at this time.

1 **Q. You mentioned earlier that the utilities need to “work out the kinks” during this**
2 **initial program triennial. Please explain.**

3 A. As noted earlier, the working groups established pursuant to the CEA Order have not
4 completed their work, and some have not even begun. In a number of ways the utilities
5 are essentially attempting to build a plane while it is already in-flight, as they litigate their
6 proposed programs and prepare to initiate program delivery in June 2021 with significant
7 issues outstanding. To take one example, the proposed utility programs will require a
8 massive increase in the energy efficiency workforce in New Jersey, and the CEA Order is
9 clear that supplier diversity and ensuring participation opportunities for a wide range of
10 contractors and disadvantaged communities is an important objective.²³ However, the
11 Workforce Development Working Group and the Equity Working Group, which are
12 tasked with implementation of this objective, have not even had their membership
13 established as of this writing.

14 Similarly, the EM&V Working Group has not yet begun its work, but the utilities
15 have already filed benefit cost and cost-to-achieve analyses for their proposed programs²⁴
16 (as they were required to do) in their program filings. At the same time, NJNG declined
17 to provide a full EM&V plan with its filing because, as described by NJNG witness
18 Anne-Marie Peracchio, it was “unable to file a detailed plan at this time in order to be

²³ CEA Order, page 12. As a common element of both core and utility-led programs, Staff recommends “Workforce development and job training partnerships and pipelines (e.g., with vocational institutions, community colleges, community-based organizations, non-profits, etc.) for EE jobs, including for local, underrepresented, and disadvantaged workers.”

²⁴ NJNG’s analyses were presented in the testimony of witness Brendon J. Baatz of Gabel Associates, Inc.

1 able to incorporate recommendations from the EM&V Working Group, as well as
2 ongoing discussions with the Utility Working Group.”²⁵ Instead, it filed “a description of
3 [its] consideration of reporting”²⁶ as Petition Exhibit P-1, Schedule NJNG-17.

4 Finally, I note that the work of the Transition Working Group is still ongoing,
5 even as the State’s contractor, TRC, is completing its work on existing CEP projects and
6 budgets and turning responsibility for currently CEP-sponsored programs over to the
7 utilities. Numerous details large and small, including data sharing, contractor
8 arrangements, and customer validation have yet to be ironed out and seem unlikely to be
9 fully resolved prior to Board consideration of this and other utility filings, and perhaps
10 even prior to program implementation.

11 **Q. Does NJNG’s service territory overlap with other utilities?**

12 A. Yes, the Company’s service territory overlaps with the territories of Atlantic City Electric
13 (“ACE”) and Jersey Central Power and Light (“JCP&L”).²⁷

14 **Q. How does NJNG propose to coordinate with electric utilities that serve customers in**
15 **its service territory, and to allocate costs and savings associated with the programs**
16 **offered by each utility?**

17 A. As noted above, the Company and the other New Jersey utilities are currently working to
18 establish a statewide coordinator (“SWC”) system, intended to be “a single third-party
19 entity to serve as a clearinghouse for measures and costs that impact more than one utility

²⁵ Petition Exhibit P-2, Direct testimony of Anne-Marie Peracchio, page 24 at 7-9.

²⁶ *Id.* at 9-10.

²⁷ Petition Exhibit P-2 page 7 at 26-27.

1 in situations where gas and electric service territories overlap.”²⁸ Also noted earlier, the
2 utilities issued an RFP in November, but have not yet formalized a contract with any
3 parties. In the Company’s Petition, Exhibit P-2, the following explanation offers insight
4 into the coordination required by lead and partner utility.

5 “The Lead Utility will be the primary contact for any customer or
6 contractor interactions on [a] project. They will also issue the incentive
7 payment and transmit all necessary information to the SWC to facilitate
8 the allocation of costs and energy savings. The Partner Utility is not
9 intended to be a passive entity. They may be called upon to provide
10 supporting energy usage information to support the project and will need
11 to record the customer’s participation in their own system of record,
12 reserve funding to pay the incentive, and refresh marketing profiles to
13 ensure they aren’t sending target marketing to that customer for a program
14 they have already participated in.” (Petition, Exhibit P-2, at 8:10-19)

15 **Q. How will NJNG’s customers know whether to contact the Company or their electric**
16 **utility for energy efficiency services?**

17 A. The utilities are developing an online portal, through which customers will be able to
18 enter the system and identify desired offerings from either utility. Alternatively, as the
19 Company stated in response to discovery request EEA-NJNG-EE-7, “the customer, in
20 consultation with their contractor when applicable, will decide which measures to pursue.
21 When NJNG is the Lead Utility working with a customer, NJNG will seek to encourage
22 the comprehensive installation of both gas and electric measures as part of that project. If
23 a customer is only pursuing electric measures, NJNG would not be involved in that
24 project.”²⁹

²⁸ *Id.* page 7 at 24-26.

²⁹ Schedule EDH-2

1 **V. Quantitative Performance Indicators and Program Requirements**

2 **Q. What Quantitative Performance Indicators (“QPI”) is NJNG required to meet for**
3 **its first triennial period?**

4 A. For this first period, the Board has only required that it meet minimum gas savings levels
5 as a percentage of its sales for program years 2 and 3.³⁰ For NJNG, the targets are 0.34%
6 of annual therm sales for PY2 and 0.51% for PY3.

7 **Q. Does NJNG project that the gas savings associated with its proposed programs will**
8 **meet or exceed this minimum level of savings?**

9 A. Yes. As may be seen in Petition Schedule AMP-6, NJNG projects that the savings
10 associated with its proposed programs will equate to 0.61% and 0.59% of retail sales for
11 PY2 and PY3, respectively. The Company also expects to achieve savings of 0.55% of
12 retail sales in PY1 even though there is no corresponding minimum requirement.

13 **Q. Why has the Company proposed programs with projected savings that significantly**
14 **exceed the levels required under the CEA Order?**

15 A. According to witness Ms. Peracchio, the level of savings NJNG proposes reflects its
16 intention to “support a consistent level of activity” as it assumes responsibility for the
17 programs previously administered by the NJCEP, and to “help [the Company] serve new
18 markets that have been identified as policy priorities within the CEA Order and through

³⁰ The Board accepted Staff’s recommendation that “[t]o facilitate a smooth transition in administration of EE programs and in light of recent temporary decreases in load...there be no energy use reduction targets for PY1 (July 1, 2021 – June 30, 2022).” CEA Order page 20.

1 the CEA proceeding.”³¹ In addition, Ms. Peracchio states that its program “will allow
2 NJNG to learn about new program approaches that will be critical to position us to
3 achieve the increasing savings targets in the later years which grow at a dramatic rate.”³²

4 **Q. In your opinion, is this a reasonable objective?**

5 A. Yes. As NJNG embarks upon this significantly more ambitious EE program pursuant to
6 the CEA, it is reasonable for the Company to both ensure a reasonable continuation of
7 programs and services that were previously available from the state, and to expand its
8 offerings consistent with the policy goals articulated in the CEA and in the CEA Order.
9 At the same time, I believe that there is significant uncertainty regarding the effectiveness
10 of the Company’s proposed programs. Finally, given the savings requirements of the
11 CEA, it is reasonable for the Company to err on the high side in its savings targets,
12 especially if it can show that its proposal remains cost-effective.

13 **Q. Do you have any concerns about the savings projections provided by the Company?**

14 A. Yes. In particular, I note that for the full suite of proposed residential programs, 40% of
15 the projected savings derives from the Behavioral Program, and another 46% from the
16 Energy Efficient Products Program, for a total of 86% of the projected residential
17 program savings. The problem here is that the Company may have double-counted some
18 savings benefits. One of the primary impacts of the Behavioral Program is to encourage
19 participants to participate in the Company’s other offerings. As described in Petition

³¹ Peracchio direct testimony page 9 at 12-25.

³² *Id.* page 9 at 26-28.

1 Exhibit P-5, “The Residential Behavior subprogram educates and provides customers
2 with granular and easy-to-understand information about their energy use, the usage of
3 their peers, and suggested actionable steps to generate awareness and motivate customers
4 to produce energy savings through behavioral changes *and engagement with other*
5 *energy-efficiency programs.*”³³

6 In response to discovery request EEA-NJNG-EE-43, NJNG stated that its
7 “promotional panels on the printed Home Energy Reports [will] provide energy
8 conservation tips and information about energy efficiency programs (as well as Energy
9 Assistance programs for our low-income customer pool participating in this program);”
10 and that through its online portals customers can “learn about the savings potential for
11 particular energy savings strategies, learn about energy efficiency programs to support
12 particular strategies, and set specific energy savings goals;” and that its analytics platform
13 will help the Company “reach Moderate Income customers and make them aware of our
14 enhanced incentives.”³⁴ Each of these goals is worthwhile and well-supported, but they
15 do suggest that much of the savings will derive from the customers’ participation in the
16 Company’s other EE offerings.

17 Finally, it appears that customers may receive home energy reports from both
18 their gas and electric utilities. As explained by the Company, “As the Behavioral program
19 requires integration with specific utility billing systems, there are no plans to coordinate

³³ Petition Exhibit P-5, page 43, emphasis added.

³⁴ Schedule EDH-3

1 Home Energy Reports between gas and electric utilities.”³⁵ There is no evidence that
2 NJNG has taken into account any diminution in the savings attributable to each program,
3 including its own, in the case of such an overlap.

4 **Q. Did the Company take into account the overlapping functions of Behavioral and**
5 **other programs in performing its analysis of expected gas savings?**

6 A. It is unclear from the Company’s workpapers whether it did or not. In his workpaper,
7 NJNG witness Baatz assumed that the Behavioral Program would yield 1.0% savings in
8 the initial year for participating customers, and that this savings rate would compound,
9 with some decay, each year. However, no explanation or reference was provided in
10 support of these assumptions, so it is impossible to know whether the potential overlap
11 with other programs was accounted for.

12 **Q. Are there other requirements or standards set forth in the CEA Order that NJNG is**
13 **required to meet?**

14 A. Yes. The CEA Order set forth cost to achieve guidelines developed by Staff and
15 consultant Optimal Energy for utility-administered programs serving the residential, C&I,
16 multifamily, and low-income sectors.³⁶ Staff suggested that “these cost to achieve ranges
17 [would] be useful in evaluating the reasonableness of proposed costs to achieve energy
18 savings and recommends that utilities must provide justification as part of program filings

³⁵ Response to discovery request EEA-NJNG-EE-44 (Schedule EDH-4.)

³⁶ CEA Order pages 15-17.

1 for proposing costs that vary from the values by more than 10%.³⁷ The Board also
2 directed the utilities to perform cost benefit analyses, as will be discussed below.

3 **Q. Did NJNG perform a cost to achieve analysis for its programs?**

4 A. Yes. NJNG’s cost to achieve results are shown below in Table 3, along with the
5 corresponding guidelines from the CEA Order.

6 **TABLE 3. COST TO ACHIEVE GUIDELINES VS. NJNG PROJECTIONS. COSTS ARE IN \$/NET ANNUAL THERM**

Sector	CEA Order Guideline (\$/Therm)	NJNG Cost to Achieve (\$/Therm)	Deviation from Guideline (%)
Residential	\$8.69	\$6.84	-21%
C&I	\$4.13	\$12.47	+202%
Multifamily	\$18.69	\$26.55	+42%
LMI		\$57.70	n/a

7
8 **Q. Are NJNG’s projected cost to achieve values within 10% of the Board guidelines?**

9 A. No. As shown in Table 3, the value for residential programs is 21% below the Board’s
10 guideline, but I suspect that this result may be infected with the double-counting issue
11 raised earlier (*i.e.*, that the same savings benefits may be attributed both to the behavioral
12 program and to the other residential programs.) The value for C&I programs is three
13 times the Board’s guideline, while the value for the multifamily program is 42% higher.

14 **Q. How does NJNG explain the variance of its cost to achieve projections from the
15 Board’s guidelines?**

16 A. Witness Baatz attributes this, in part, to the fact that the Board’s cost to achieve
17 guidelines were “based upon program portfolios from Massachusetts and Rhode Island,

³⁷ *Ibid.*

*Direct Testimony of Ezra D. Hausman, Ph.D.
New Jersey Natural Gas Company – SAVEGREEN Program Filing
BPU Docket Nos. QO19010040 and GO20090622*

1 which are very mature states in the energy efficiency and not like comparisons for New
2 Jersey at this current time.”³⁸ Mr. Baatz further states that “New Jersey also is a
3 prevailing wage state, which will increase program costs relative to other states.”³⁹

³⁸ *Id.* at 8:19-9:2

³⁹ *Id.* at 9:3-4

1 **Q. Do you agree with Mr. Baatz’s rationalization for exceeding the Board’s cost to**
2 **achieve guidelines?**

3 A. No. I do not agree with his assertion that because the EE programs in Massachusetts and
4 Rhode Island are more mature than New Jersey’s their applicability to New Jersey may
5 be discredited. NJNG itself has offered EE Programs for more than a decade, since its
6 initial SAVEGREEN Program was approved in 2009.⁴⁰ The Programs proposed by
7 NJNG and the other utilities are all programs that have been offered in New Jersey either
8 by the State CEP or by the utilities, for years. In any case, the CEA Order explained that
9 “[t]he [cost to achieve guidelines] analysis began by mapping EE and PDR programs
10 from Massachusetts and Rhode Island, which are states that have achieved energy use
11 reductions comparable to the target reductions established in New Jersey, to the programs
12 that New Jersey intends to implement.”⁴¹ BPU Staff took further precautions to ensure
13 the costs to achieve were not unreasonable by allowing for a threshold of ten percent with
14 no justification required.⁴²

15 Mr. Baatz also cited prevailing wage as a reason NJNG’s Commercial &
16 Industrial, Multi-Family, and low-income programs exceed the Board targets. However,
17 eight of ten states bordering or near to New Jersey, including Massachusetts and Rhode

⁴⁰ BPU Docket Nos. EO09010056 and GO09010057. See footnote 7 for a full history of NJNG SAVEGREEN program dockets.

⁴¹ CEA Order, pp. 15-16.

⁴² *Id.* p. 16.

1 Island, are prevailing wage states.⁴³ NJNG has not provided a compelling explanation for
2 why its programs exceed the cost to achieve guidelines set forth by the Board.

3 **Q. How do NJNG’s cost to achieve results compare with those projected by New**
4 **Jersey’s other gas utilities?**

5 A. A comparison of NJNG’s results with those projected by South Jersey Gas (“SJG”) and
6 Elizabethtown Gas (“ETG”) is shown in Table 4. As may be seen, NJNG’s cost to
7 achieve projections are significantly higher than those found by SJG, but slightly below
8 those found by ETG.

9 **TABLE 4. COST TO ACHIEVE COMPARISON FOR NEW JERSEY GAS UTILITIES.**

Sector	NJNG	SJG⁴⁴	ETG⁴⁵
Residential	\$6.84	\$5.84	\$4.46
C&I	\$12.47	\$4.13	\$14.03
Multifamily	\$26.55	\$18.69	\$28.88
LMI	\$57.70	\$28.37	\$61.11

10 **Q. How should the Board respond to the high cost to achieve values presented by**
11 **NJNG?**

12 A. The Board should be concerned because the high values need further explanation.

13 However, I agree with Mr. Baatz that “[t]he NJNG programs were designed to build from

⁴³ U.S. Department of Labor, Wage and Hour Division. 01/01/2020. "Dollar Threshold Amount for Contract Coverage" <https://www.dol.gov/agencies/whd/state/prevaling-wages>. Note: the states near New Jersey that also have prevailing wage laws include: Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Maryland, and Delaware.

⁴⁴ I/M/O the Petition of South Jersey Gas Company for Approval of New Energy Efficiency Programs and Associated Cost Recovery Pursuant to the Clean Energy Act (BPU Docket No. GO20090618.) Petition Schedule IGF-7.

⁴⁵ I/M/O the Petition of Elizabethtown Gas Company for Approval of New Energy Efficiency Programs and Associated Cost Recovery Pursuant to the Clean Energy Act and the Establishment of a Conservation Incentive Program (BPU Docket No. GO20090619.) Petition Schedule IGF-7.

1 those currently offered by DCE with modifications geared to achieve deeper, longer
2 lasting savings. The first-year cost to achieve metrics do not capture the long-term focus
3 of these programs.”⁴⁶ Cost to achieve is a useful metric for comparing utility programs, as
4 in Table 4, but it does not take into account the value of energy savings over the lifetime
5 of each measure, or any other benefits provided by the programs. A full cost benefit
6 analysis is a better measure of the cost effectiveness and customer value associated with
7 EE programs.

8 **Q. Has NJNG provided all of the cost benefit analyses required pursuant to the CEA**
9 **Order?**

10 A. Yes. The CEA Order states that utilities shall analyze their programs using the yet-to-be
11 defined New Jersey Cost Test as a primary test of cost effectiveness;⁴⁷ Staff further
12 recommended that “a modified Total Resource Cost Test (“TRC”) be used as the primary
13 New Jersey Cost Test for the first three-year program cycle.”⁴⁸ This recommendation was
14 accepted by the Board in its August 24, 2020 order,⁴⁹ which also directed that the utilities
15 “continue to report the results of the existing TRC, SCT, PACT, PCT, and RIM for

⁴⁶ Baatz direct testimony page 8 at 14-17.

⁴⁷ CEA Order, page 32.

⁴⁸ *Ibid.*

⁴⁹ I/M/O Implementation of the CEA - NJ Cost Test , BPU Dkt. Nos. QO19010040 and QO20060389 (Order, August 24, 2020).

1 informational purposes.”⁵⁰ Mr. Baatz of Gabel Associates performed each of these tests
2 on behalf of the Company.

3 **Q. Have you reviewed the workpapers and results provided by Mr. Baatz?**

4 A. Yes I have, as has Rate Counsel witness Dr. David Dismukes. Dr. Dismukes raises a
5 number of concerns about the quality and credibility of Mr. Baatz’ analyses in his
6 testimony, and I believe these shortcomings compromise the value of the analyses for
7 evaluating the Company’s proposals.

8 **Q. Did NJNG find its proposed programs to be cost effective?**

9 A. Overall, yes. The full CBA results as calculated by Mr. Baatz are shown in Table 5. The
10 NJCT is highlighted as it has been designated the primary test by the Board. Subject to
11 the validity of Mr. Baatz’s analysis, it appears that the portfolio proposed by NJNG is
12 cost effective and may be expected to produce overall lifetime benefits that are twice
13 their overall cost, as measured by the NJCT.

14 However, there are significant deficiencies in the Company’s analysis, as
15 discussed in detail in Dr. Dismukes’ testimony. Therefore, I do not recommend that the
16 Board rely on the Company’s filed analyses in this area.

⁵⁰ The existing tests are based on the California Standard Practice Manual (available at [https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy - Electricity and Natural Gas/CPUC STANDARD PRACTICE MANUAL.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/CPUC_STANDARD_PRACTICE_MANUAL.pdf)) and are as follows: the Total Resource Cost Test (“TRC”); Societal Cost Test (“SCT”), Program Administrator Cost Test (“PACT”), Participant Cost Test (“PCT”) and Ratepayer Impact Measure (“RIM”).

**TABLE 5. COST BENEFIT ANALYSIS RESULTS FOR NJNG PROPOSED PROGRAMS
 AS REPORTED BY THE COMPANY⁵¹**

	NJCT	SCT	TRC	PCT	PAC	RIM
Residential						
Behavioral	1.8	2.4	1.4	2.9	1.4	0.8
Energy Efficient Products	1.5	4.4	0.9	1.9	1.4	0.8
HPwES	1.0	2.2	0.6	1.7	0.7	0.5
QHEC	0.9	1.9	0.6	10.2	0.6	0.5
Aggregate Residential	1.3	3.6	0.8	2.0	1.1	0.7
Commercial & Industrial						
Custom and Prescriptive.	4.5	9.6	2.8	8.5	1.3	0.9
Energy Management	0.6	1.8	0.4	0.9	0.8	0.6
Engineered Solutions	1.2	2.4	0.7	1.3	1.0	0.8
Direct Install	5.6	11.2	4.0	4.9	3.1	1.4
Aggregate C&I	3.0	6.1	2.1	2.9	2.1	1.2
Other						
Moderate Income Weatherization	0.6	1.2	0.3	1.6	0.3	0.3
Multi-Family	2.0	4.3	1.2	2.3	1.5	1.0
Hybrid Heat	1.2	8.4	0.6	2.4	0.5	0.4
Total Portfolio	2.0	4.8	1.4	2.4	1.6	1.0

1

2 **VI. Program Budget**

3 **Q. What is NJNG’s proposed budget for its programs?**

4 A. As reported in Schedule NJNG-12, the Company has proposed a total budget of
 5 approximately \$258 million.⁵² Of this, \$220 million (85%) is for direct program costs
 6 including rebates and loans; \$22.4 million (8.7%) is for administration and marketing; \$8

⁵¹ Data source: Petition Exhibit BJB-2.

⁵² Based on the budgets shown in Petition Exhibit P-5 and Schedule NJNG-12.

1 million (3.1%) is for EM&V; and the remaining \$1.8 million (0.7%) is for unspecified
2 start-up capital costs and inspections and quality control.

3 On October 20th, 2020, the Company filed “updated” materials, including a file
4 entitled “REVISED SCHEDULES JMC-1 through JMC-3.xlsx”. This file showed a
5 change to the 10-year OBRP amounts for the proposed prescriptive program, and the
6 elimination of 10-year OBRP from the proposed Hybrid Heat program. It is not clear
7 from the Company’s communications accompanying this filing whether this represented
8 corrections of its earlier filing or a change in its proposed programs. The version of
9 Petition Exhibit NJNG-12 included with the updated filing appears to be identical to the
10 original version, so it appears that the Company’s proposed budget is unchanged from its
11 September 25th, 2020 filing.

12 The budgets for the specific Core and Utility-Led programs were shown in

TABLE 1. NJNG PROPOSED CORE PROGRAM OFFERINGS, DEPLOYMENT LEVEL, AND BUDGET

Sector	Program	Program Description	Projected Deployment	Proposed Budget (\$M total)
Residential	Energy Efficient Products	Incentives for Efficient Products, including retail products, appliance rebates, HVAC equipment, and appliance recycling.	94,000 Products per year	\$56.8
Residential	Existing Homes - HPwES	Incentives to encourage customers to pursue comprehensive upgrades to their home.	2,181 Customers	\$29.8
Multifamily	Multifamily	Work with customers to identify efficiency projects; focus on comprehensive projects wherever possible; incentives to encourage energy efficiency investments.	2,757 Multifamily buildings	\$25.5
C&I	Direct Install	Efficiency measures and incentives for small businesses, non-profit organizations, municipalities, schools and faith-based organizations.	733 Customers	\$48.9
C&I	Prescriptive and Custom	Prescriptive or custom installation of high-efficiency electric and/or natural gas equipment measures and incentives for commercial and industrial customers.	3,196 Customers	\$23.7

1 and Table 2, respectively. In addition, the Company has proposed “Portfolio
2 costs” that are not directly attributable to any specific program, of \$3.5 million, or 1.3%
3 of the total.

4 **Q. Do you believe that this is a reasonable budget allocation?**

5 A. Yes, in general. However, it appears that the proposed budget can only be seen as an
6 estimate, as so many of the program elements are still under development in the various

1 working groups. Whether customers ultimately engage in EE programs through the
2 Company or through its overlapping electric utilities may also affect the overall level of
3 expenditures by NJNG in ways that are difficult to predict.

4 However, I recommend that the Board reject the Company’s proposed Hybrid
5 Heat Program, which would reduce the overall budget by approximately \$5.6 million.

6 **Q. Do you have any comments about the incentive levels proposed by NJNG for its**
7 **programs?**

8 A. The incentive levels proposed by the Company are consistent with those offered by the
9 other New Jersey gas utilities and are the product of (and subject to) an ongoing
10 collaborative effort undertaken by the Utility Working Group. They are also generally
11 consistent with incentives that have been offered for similar programs administered by
12 the CEP and the utilities themselves. However, in its Order approving the stipulation for
13 PSE&G’s recent CEF-EE filing, the Board noted that PSE&G’s incentives were “subject
14 to modification consistent with the Framework Order and in cooperation with the BPU’s
15 Utility Working Group and the Utilities’ Program Working Groups.”⁵³ The same caveat
16 must apply here. I am also concerned about the very high benefit-to-cost ratio of 8.5
17 reported for the PCT test for the C&I Custom and Prescriptive program,⁵⁴ meaning that
18 participants receive \$8.50 for every dollar they invest in energy efficiency under this

⁵³ I/M/O PSE&G CEF-EE, BPU Dkt. Nos. GO18101112 and EO18101113 (Order, September 23, 2020), page 12.

⁵⁴ As noted earlier, the validity of the Company’s cost benefit analyses is a significant concern, addressed in Dr. Dismukes’ testimony.

1 program. This may also help to explain the high cost-to-achieve level for the Company's
2 C&I programs overall.

3 Nonetheless, I am hesitant to recommend that the Board disallow this high
4 incentive level and disrupt the ongoing collaborative program design process, which is
5 presumably informed by the program administrators' experience, at this stage. The
6 Company and the other New Jersey utilities should be put on notice, however, that
7 improved program designs or a more detailed justification will be required if they
8 continue to exceed the Board's cost-to-achieve guidelines in their program
9 implementation and in their future EE filings.

10 **VII. Recommendations**

11 **Q. What are your recommendations for the Board?**

12 A. I recommend that the Board approve the Company's proposed core and utility-led
13 programs, with the exception of its proposed Hybrid Heat Pilot Program, and subject to
14 the same caveats as in the PSE&G case. The Board should also make clear that while a
15 certain amount of leeway may be appropriate during this transitional period, more
16 rigorous, consistent, and transparent cost-benefit analysis will be required for all future
17 EE filings.

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

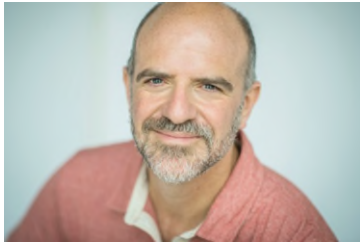
19 A. Yes, it does at this time. Rate Counsel reserves its right to present supplemental
20 testimony based on any updated and/or new information.

Exhibit EDH-1

BPU DOCKET NOs. QO19010040 and GO20090622

Ezra D. Hausman, Ph.D.

Curriculum Vitae



I am an independent consultant in energy and environmental economics.

I have worked for over two decades as an energy market expert with a focus on market design and market restructuring, planning and ratemaking, energy efficiency programs, environmental regulation, 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, and provided other support in both regulated and restructured electricity markets 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 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:

- Ratemaking and regulatory proceedings
- Wholesale market design and analysis for electricity, generating capacity, and related services
- Demand-side management/energy efficiency program design and cost/benefit analysis
- Utility role in developing electric vehicles infrastructure
- Interaction of air quality and environmental regulations with electricity markets
- Analysis and implementation of greenhouse gas rules
- Clean Air Act enforcement support
- Long-term electric power system planning
- Consumer and environmental protection
- Market power and market concentration analysis in electricity markets.

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 and natural gas markets, generation and transmission systems.

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.

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.

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

Quantitative risk analysis to support federal environmental policy-making.

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

Applied and evaluated demand forecasting techniques for the Eastern Massachusetts service area; assessed yield/reliability relationship for the eastern Massachusetts water supply system.

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

Before the New York Public Service Commission (Cases 20-E-0380 & 20-G-0381) – 2020-Ongoing

Expert Witness on behalf of the Sierra Club in Niagara Mohawk Power Corporation Gas and Electric Rate filings.

Before the New Jersey Board of Public Utilities (Docket No. GO20090622) – 2020-ongoing

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the New Jersey Natural Gas SAVEGREEN filing pursuant to the New Jersey Clean Energy Act.

Before the New Jersey Board of Public Utilities (Docket No. GO20090618) – 2020-ongoing

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the South Jersey Gas Energy Efficiency filing pursuant to the New Jersey Clean Energy Act.

Before the New Jersey Board of Public Utilities (Docket No. GO20090619) – 2020-ongoing

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Elizabethtown Gas Energy Efficiency filing pursuant to the New Jersey Clean Energy Act.

Before the New Jersey Board of Public Utilities (Docket No. EO20090620) – 2020-ongoing

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Jersey Central Power & Light Energy Efficiency and Conservation Plan filing pursuant to the New Jersey Clean Energy Act.

Before the New Jersey Board of Public Utilities (Docket No. EO20090621) – 2020-ongoing
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Atlantic City Electric Company Energy Efficiency Program filing pursuant to the New Jersey Clean Energy Act.

Before the New Jersey Board of Public Utilities (Docket No. EO20090623) – 2020-ongoing
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Rockland Electric Company Energy Efficiency and Peak Demand Reduction Programs filing pursuant to the New Jersey Clean Energy Act.

Before the Public Utility Commission of Oregon (Case No. UE 374) – 2020-Ongoing
Expert witness on behalf of the Sierra Club in Pacific Power General Rate Case.

Before the Pennsylvania Public Utility Commission (Docket No. R-2020-3017206) – 2020-ongoing
Expert witness on behalf of the Clean Energy Council regarding Philadelphia Gas Works' general rate increase request.

Before the Public Service Commission of the District of Columbia (Formal Case No. 1154) – 2020
Expert witness on behalf of the Sierra Club regarding Washington Gas Light's PROJECTpipes II filing.

Before the New Jersey Board of Public Utilities (Docket No. EO18020190) – 2018-2020
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Atlantic City Electric's proposed Voluntary Program for Plug-In Vehicle Charging.

Before the New Jersey Board of Public Utilities (Docket. Nos. ER18070688 and GR18070689) – 2019
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Public Service Electric & Gas' 2018 PSE&G Green Programs Cost Recovery Filing. Settled prior to filing of intervener testimony.

Before the New Jersey Board of Public Utilities (Docket No. G018030350) – 2018
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the South Jersey Gas' Energy Efficiency Programs IV filing. Settled prior to filing of intervener testimony.

Before the New Jersey Board of Public Utilities (Docket No. GO18030355) – 2018
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the New Jersey Natural Gas Company's SAVEGREEN energy efficiency and renewable energy programs. Case was settled prior to filing of intervener testimony.

Before the New Jersey Board of Public Utilities (Docket No. EO18101111) – 2018-ongoing
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Public Service Electric & Gas' proposed *Clean Energy Future - Electric Vehicle and Energy Storage* program.

Before the New Jersey Board of Public Utilities (Docket Nos. GO18101112 and EO16101113) – 2018-2020
Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the Public Service Electric & Gas' proposed *Clean Energy Future - Energy Efficiency* program.

New Jersey Board of Public Utilities – 2020

Expert participation is stakeholder process regarding conversion to high-efficiency street lights on behalf of Rate Counsel.

New Jersey Board of Public Utilities – 2019-Ongoing

Expert participation is stakeholder process regarding transportation electrification policies on behalf of Rate Counsel.

New Jersey Division of Rate Counsel – 2016-Ongoing

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

Before the Washington Utilities and Transportation Commission – 2020

Expert witness on behalf of the Sierra Club regarding potential sale of ownership sale in Colstrip generating unit.

Before the Utah Public Service Commission (Docket No. 18-035-36) – 2020

Expert witness on behalf of the Sierra Club in Rocky Mountain Power depreciation case.

PacifiCorp Multi-State Protocols Stakeholder Process – 2019-Ongoing

Participation on behalf of Sierra Club in stakeholder process to establish protocols for allocation of resource costs and benefits among PacifiCorp states.

Advisory Consulting for Natural Resources Defense Council – 2019-2020

Provide advisory and technical support to analysis team.

Memphis Light, Gas and Water – Power Supply Alternatives Study 2019-2020

Expert support for Sierra Club participation in Power Supply Advisory Team.

Before the Washington Utilities and Transportation Commission (Dockets UE-190334 and UG-190335) – 2019

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

Before the Public Service Commission of South Carolina (Docket No. 2018-319-E) – 2019

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

Before the Public Service Commission of South Carolina (Docket No. 2018-318-E) – 2019

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

Before the Virginia State Corporation Commission (Case No. PUR-2018-00065) – 2018

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

Before the Missouri Public Service Commission (Case No. EO-2018-0038) – 2018

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

Before the Florida Public Service Commission (Docket No. 20170225-EI) – 2017-2018

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

Before the 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.

Before the New Jersey Board of Public Utilities (Docket No. ER17080869) – 2017

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding Public Service Electric and Gas Company's proposed Energy Efficiency 2017 Program.

Before the New Jersey Board of Public Utilities (Docket No. EO17030196) – 2017

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding Rockland Electric Company's proposed Low Income Audit and Install Energy Efficiency Program.

Before the New Jersey Board of Public Utilities (Docket No. GO15050504) – 2017

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding Elizabethtown Gas Company's Petition to Extend the Term of Energy Efficiency Programs. Settled prior to filing of intervener testimony.

Before the 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.

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

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

Before the 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.

Before the 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.

Before the New Jersey Board of Public Utilities (Docket No. GO14121412) – 2015

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding the New Jersey Natural Gas Company's petition for approval of its Extension of Energy - Efficiency Programs. Case was settled prior to filing of intervener testimony.

Before the New Jersey Board of Public Utilities (Docket No. GR15010090) – 2015

Expert witness on behalf of the New Jersey Division of Rate Counsel regarding South Jersey Gas Company's petition for for Approval to Continue its Energy Efficiency Programs and Energy Efficiency Tracker. Case was settled prior to filing of intervener testimony.

United States Department of Justice – US District Court for the Eastern District of Missouri (Civil Action No. 4:11-CV-00077) – 2013-2019

Expert witness on behalf of the United States Department of Justice on successful prosecution of clean air act case.

Before the 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.

Before the Missouri Public Service Commission (File No. ER-2014-0258) – 2014-2015

Expert witness on behalf of the Sierra Club in Ameren Missouri rate case.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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.

Before the 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 CO₂.

Before the 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.

Before the 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.

Before the 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 CO₂, global climate change and the environment of South Dakota and Minnesota, respectively.

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

Submitted prefiled direct testimony on behalf of the Arkansas Commission General Staff 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.

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

Profile 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.

Before the 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., Review of AltaGas' Climate Business Plan and Renewable Natural Gas Study. Technical report prepared on behalf of the Sierra Club, June 2020.

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 CO2 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 CO2 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 CO2 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 CO₂ Cap-and-Trade.” September 2009.

NARUC 2009 Summer Meeting: Invited speaker on topic: “Productive and Unproductive Costs of CO₂ 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 December 2020

Exhibit EDH-2

BPU DOCKET NOS. QO19010040 and GO20090622

**In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the
Establishment of Energy Efficiency and Peak Demand Reduction Programs**

**In the Matter of the Petition of New Jersey Natural Gas Company for Approval of
Energy Efficiency Programs and the Associated Cost Recovery Mechanism
Pursuant to the Clean Energy Act**

BPU Docket Nos. QO19010040 and GO20090622

Discovery Response

- EEA-NJNG-EE-7: It appears that all core programs will combine both electric and gas efficiency products and measures.
- a. Please explain how NJNG will determine whether a project or subprogram will offer gas and/or electric efficiency products or measures for each program that will use both.
 - b. Does NJNG also intend to market electric efficiency products or measures for core programs?
 - c. Please provide any data NJNG considered when establishing this policy.

Response:

- a. The core programs are generally designed to include electric and natural gas measures. In most cases, the customer, in consultation with their contractor when applicable, will decide which measures to pursue. When NJNG is the Lead Utility working with a customer, NJNG will seek to encourage the comprehensive installation of both gas and electric measures as part of that project. If a customer is only pursuing electric measures, NJNG would not be involved in that project.
- b. NJNG intends to market electric efficiency measures for all comprehensive programs. In regard to the EE Products program, which includes many electric measures that may not be installed as part of a comprehensive project, NJNG intends to promote those offers to customers as well. Since our Conservation Incentive Program was established in 2006, NJNG has been actively promoting incentives on electric products and intends to continue to do so.
- c. There is no data relevant to this policy decision.

Exhibit EDH-3

BPU DOCKET NOS. QO19010040 and GO20090622

**In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the
Establishment of Energy Efficiency and Peak Demand Reduction Programs**

**In the Matter of the Petition of New Jersey Natural Gas Company for Approval of
Energy Efficiency Programs and the Associated Cost Recovery Mechanism
Pursuant to the Clean Energy Act**

BPU Docket Nos. QO19010040 and GO20090622

Discovery Response

EEA-NJNG-EE-43: On page 44 of Exhibit P-5, the Behavioral Program description states that “this program will influence residential customers to be more aware of other NJNG energy efficiency programs and drive participation in these programs as well.”

- a. Please expand on what NJNG will do to drive customer participation in other programs through the Behavioral Program.
- b. Please expand on what factors from this program NJNG will utilize to achieve deeper savings.

Response:

- a.-b. NJNG has worked with multiple Behavioral program vendors and leveraged all promotional features available through their specific service. Examples of these types of features include:
 - Use of promotional panels on the printed Home Energy Reports to provide energy conservation tips and information about energy efficiency programs (as well as Energy Assistance programs for our low-income customer pool participating in this program).
 - Use of promotional panels on the electronic Home Energy Reports for customers where NJNG has an email address available and the customer has not opted out of receiving this communication.
 - Use of online portals where customers can further analyze their usage, learn about the savings potential for particular energy savings strategies, learn about energy efficiency programs to support particular strategies, and set specific energy savings goals.
 - Use of an analytics platform to help the Company target customers based upon specific characteristics (e.g. income levels, answers to online portals). NJNG has leveraged this feature to pilot a specific campaign to reach Moderate Income customers and make them aware of our enhanced incentives.

Exhibit EDH-4

BPU DOCKET NOS. QO19010040 and GO20090622

**In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the
Establishment of Energy Efficiency and Peak Demand Reduction Programs**

**In the Matter of the Petition of New Jersey Natural Gas Company for Approval of
Energy Efficiency Programs and the Associated Cost Recovery Mechanism
Pursuant to the Clean Energy Act**

BPU Docket Nos. QO19010040 and GO20090622

Discovery Response

EEA-NJNG-EE-44: For customers with both gas and electric homes, are there plans to coordinate Home Energy Report subprograms and/or Behavioral programs among the gas and electric utilities?

a. Please expand on any efforts thus far.

Response: As the Behavioral program requires integration with specific utility billing systems, there are no plans to coordinate Home Energy Reports between gas and electric utilities. The Home Energy Reports also provide customer specific insights on different energy sources so there can be situations where a customer may be doing a good job at conserving their usage on one energy source but not on the other.