

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

**IN THE MATTER OF THE PETITION OF)
SOUTH JERSEY GAS COMPANY) BPU DKT. NO. GO12050363
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)**

**DIRECT TESTIMONY OF MAXIMILIAN CHANG
ON BEHALF OF THE
NEW JERSEY DIVISION OF RATE COUNSEL**

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1 **I. STATEMENT OF QUALIFICATIONS**

2 **Q. WHAT IS YOUR NAME, POSITION AND BUSINESS ADDRESS?**

3 A. My name is Maximilian Chang. I am an Associate with Synapse Energy
4 Economics, Inc., 485 Massachusetts Ave., Cambridge, MA 02139.

5 **Q. PLEASE DESCRIBE SYNAPSE ENERGY ECONOMICS.**

6 A. Synapse Energy Economics is a research and consulting firm specializing in
7 electricity industry regulation, planning and analysis. Synapse works for a variety
8 of clients, including consumer advocates, regulatory commissions, and
9 environmental advocates.

10 **Q. PLEASE DESCRIBE YOUR EXPERIENCE IN THE AREA OF**
11 **ELECTRIC UTILITY RESTRUCTURING, REGULATION AND**
12 **PLANNING.**

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

24 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE BEFORE**
25 **BEGINNING YOUR CURRENT POSITION AT SYNAPSE ENERGY**
26 **ECONOMICS.**

27 A. Before joining Synapse Energy Economics, I previously worked at Environmental
28 Health and Engineering managing indoor air quality environmental projects; at

1 the Penobscot Group analyzing real estate investment trusts on behalf of
2 institutional investors; and at Brigham and Women’s Hospital conducting cancer
3 research. I hold an M.S. degree from the Harvard School of Public Health in
4 Environmental Health and Engineering Studies, and a B.S. degree from Cornell
5 University in Biology and Classics.

6 **II. SCOPE AND PURPOSE OF TESTIMONY**

7 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?**

8 A. I am testifying on behalf of the New Jersey Division of Rate Counsel (“Rate
9 Counsel”).

10 **Q. HAVE YOU TESTIFIED BEFORE ON SJG RGGI EE PROGRAMS?**

11 A. No.

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

14 A. This testimony describes the results of my review and analysis of the petition
15 (“Petition”) of South Jersey Gas Company (“SJG” or “the Company”) for
16 approval of its proposed Regional Greenhouse Gas Initiative (“RGGI”) energy
17 efficiency programs (“EEP II”) for a one year period, SJG’s filed testimony, and
18 SJG’s responses to discovery.¹ My testimony addresses the overall cost-
19 effectiveness and design of SJG’s proposed energy efficiency (“EE”) programs.
20 Cost recovery and accounting for SJG’s proposed programs is addressed in the
21 testimony of Rate Counsel witness Robert J. Henkes. Rate of return and cost of
22 capital for SJG’s proposed programs is addressed in the testimony of Rate
23 Counsel witness Matthew Kahal.

¹ My review encompasses SJG’s original Petition, dated May 2, 2012; and SJG’s supplemental testimony (Ms. Sonda Renee Farmer and Mr. Bruce Grossman), dated June 26, 2012, submitted in responses to a Board Staff deficiency letter dated June 1, 2012.

1 **III. SUMMARY OF FINDINGS AND RECOMMENDATIONS**

2 **Q. ON WHAT MATTERS DO YOU PRESENT FINDINGS?**

3 A. My findings address the following matters:

- 4 A. Summary of SJG's Current Programs
- 5 B. Summary of SJG's Proposed Programs
- 6 C. Program Benefits
- 7 D. Cost/benefit Analysis
- 8 E. Enhanced Residential HVAC Energy Efficiency Program
- 9 F. Social Marketing and Education Program ("OPOWER")
- 10 G. Natural Gas Vehicles Program
- 11 H. Non-Residential Energy Efficiency Finance and Incentive Program
- 12 I. Combined Heat and Power and Distributed Generation Technology Program
- 13 J. Program Evaluation
- 14 K. CEP Program Developments
- 15 L. Source of Funding

16 **Q. PLEASE SUMMARIZE YOUR MAJOR FINDINGS.**

17 A. My major findings may be summarized as follows.

- 18 1. SJG's EE programs are structured to provide additional monetary incentives to
- 19 efficiency measures already available through New Jersey's Clean Energy
- 20 Program ("CEP" or "NJCEP"), and to provide third-party financing options for
- 21 efficiency measure installations by participants, also currently available through
- 22 CEP. In response to RCR-EE-17, SJG has presented no incremental energy
- 23 savings that will accrue because of its programs, i.e. the savings beyond what
- 24 would most likely occur in the absence of SJG's programs due to CEP measures
- 25 alone. Moreover, SJG does not demonstrate that these additional incentives are
- 26 necessary to incent customer participation in the CEP, nor does SJG demonstrate
- 27 that the incentives will lead to overall increased program participation. These
- 28 deficiencies cast serious doubt on the value of SJG's proposed programs to
- 29 ratepayers.

- 1 2. SJG's proposed Natural Gas Vehicles and Combined Heat and Power and
2 Distributed Generation programs are load building programs that will result in
3 *increased* natural gas consumption.
- 4 3. Applied Energy Group has conducted a cost-benefit analysis of the CEP's
5 WARMAdvantage and Home Performance with Energy Star ("HPwES")
6 programs. That analysis, reported in June 2012, demonstrates that CEP's
7 WARMAdvantage and HPwES programs are not cost-effective using either or
8 both of the Total Resource Cost ("TRC") and Program Administrator ("PA")
9 benefit-cost tests. SJG's programs would increase combined CEP-SJG
10 WARMAdvantage and HPwES program costs, and thus make these programs less
11 cost-effective overall.

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

- 13 A. In summary, in view of the many serious difficulties with the Company's
14 proposals I describe in the body of my testimony, the BPU should deny most
15 elements of the Petition as proposed, allowing only for the Social Marketing and
16 Education Program ("OPOWER") to proceed in the current form.

17 **IV. ANALYSIS OF SJG'S PROPOSED ENERGY EFFICIENCY PROGRAMS**

18 **A. *Summary of SJG's Current Programs***
19

20 **Q. PLEASE DESCRIBE THE ENERGY EFFICIENCY PROGRAMS**
21 **CURRENTLY OFFERED BY SJG.**

- 22 A. SJG conducts EE activities initially approved by the Board in an Order dated July
23 24, 2009 in Docket No. GO09010059. The Company has sought to increase the
24 energy efficiency tracker rate for these programs in pending Docket Nos.
25 GO10070466 and GR1106336. The Company refers to its energy efficiency
26 programs as "EEP." SJG's EEP generally provides additional incentives and
27 services to customers who participate in the CEP. SJG's current EEP offerings
28 that go beyond NJCEP incentives are detailed in the following table:

1 **TABLE MC 1 Current SJG Energy Efficiency Programs**

Program	Description	Cumulative Participants from 2009
Enhanced Residential Rebate	WarmAdvantage rebate of \$900 that is conditional to the completion of a HPwES Tier I audit.	5,132
Home Performance Finance EE- Loan Interest Buy-downs and Income Qualified	Participants are required to be in Tier II of NJ Home Performance. The company offers incentives for 100% of gas reducing measures up to \$20,000. The Company also assigns \$10,000 of CEP rebates to reduce the principal of the SJG repayment plan which is up to a 10-year loan.	1,129
Commercial Direct Install	For participants with electric usage of up to 200 kW per month, the Company offers \$25,000 interest free loan for up to 10 years.	0
Non-residential EE Investment	The Company provides up to \$100,000 in “up front” financing options to purchase the difference in whole building energy efficiency products.	50
Combined Heat and Power	The Company provides up to \$1,000,000 in matching incentives.	2
Data taken from SJG’s EET true-up petition dated June 1, 2012, in BPU Dkt. No.GR12060473, Exhibit 11, (Cumulative participants from August 2009 through April 2012).		

2

3 Notably, SJG ratepayers are subject to the Societal Benefits Charge (“SBC”), a
 4 portion of which funds the CEP pursuant to N.J.S.A. 48:3.49 et seq., and the
 5 Board’s Order in Docket No. EO07030203 (dated April 21, 2010). A portion of
 6 the SBC funds collected goes to supporting renewable energy programs, while
 7 most supports EE initiatives.

8 ***B. Summary of SJG’s Proposed Programs***

9

10 **Q. PLEASE DESCRIBE WHAT IS BEING PROPOSED IN THE**
 11 **COMPANY’S PETITION.**

1 A. In the present Petition, SJG “proposes five new Energy Efficiency Programs
2 (“EEP II”) targeted at the RGGI legislation.”² The Petition is filed pursuant to
3 N.J.S.A. 48:3-98.1, the filing requirements of which are set forth in the Board’s
4 May 12, 2008 Order in Docket No. EO08030164 (“RGGI Standards Order”).

5 The EE programs for which SJG seeks approval include: (1) an Enhanced
6 Residential HVAC Energy Efficiency program, (2) a Natural Gas Vehicle Grant
7 program, (3) a Social Marketing and Education program (also called the
8 OPOWER pilot), (4) a Nonresidential Energy Efficiency Finance and Incentive
9 program, and a (5) Combined Heat and Power and Distributed Generation
10 Technology grant program. Collectively, the Company calls these programs “EEP
11 II”.

12 Specifically, the proposed offerings include the following:

13 1. Enhanced Residential HVAC Energy Efficiency Program proposes to offer
14 incentives for energy efficient heating, ventilation, and air conditioning
15 (“HVAC”) measures contingent on a HPwES home energy audit for
16 WARMAdvantage measures. Participants are allowed one of three following
17 incentive options:

- 18 ○ An extra customer incentive of \$900, over and above CEP
19 WARMAdvantage incentives, for efficient HVAC equipment, or
- 20 ○ Financing for up to \$8,000 for a 5 year term.
- 21 ○ If the customer chooses to install an efficient residential gas
22 furnace/boiler to achieve savings of at least 20%, the Company will
23 provide 10-year, 0% financing for up to \$10,000 of net customer costs
24 to implement NJCEP HPwES measures.

25 2. Social Marketing and Education Program proposes to implement an
26 OPOWER program that would provide a sample of its customers with

² Petition, dated May 2, 2012, paragraph 24.

1 personalized, educational materials encouraging behavioral changes to reduce
2 energy consumption, similar to New Jersey Natural Gas' OPOWER program.

3 3. Non-Residential Energy Efficiency Finance and Incentive Program proposes
4 to provide financing to any qualified customer who applies for any CEP
5 commercial and industrial program:

6 ○ For customers with an electric load of 150 kilowatts per month or less,
7 SJG will provide five year zero interest loans up to \$75,000 per
8 account and \$250,000 per entity.

9 ○ For customers with an electric load of 150 kilowatts per month or
10 more, SJG will provide up to ten year zero interest loans up to
11 \$250,000 per account and \$500,000 per entity.

12 ○ For all participants, the loans will be structured such that any approved
13 customer incentive from CEP or SJG will be assigned back to SJG to
14 reduce the loan principal and that all incentives paid to the customer
15 would be paid directly by SJG.

16 4. Natural Gas Vehicles ("NGV") Grant Program proposes to fund the
17 conversion of 120 new compressed natural gas vehicles in public sector fleet
18 owned motor vehicles. Grants will be capped at \$250,000 per individual
19 applicant.

20 5. Combined Heat and Power and Distributed Generation ("CHP/DG")
21 Technology Program proposes to offer incentives up to \$1,000,000 per
22 applicant for three CHP projects within the Company's service territory.

23 A summary of the proposed budgets and the anticipated participation levels for the
24 EEP II programs is detailed in the following table.

1 **TABLE MC 2 Proposed EEP II**

Program	Budget	Percent Budget	Projected Cumulative Participants
Enhanced Residential HVAC Energy Efficiency	\$14,528,424	60%	1,465
Natural Gas Vehicle Grant Program	\$3,220,000	13%	120
Non Residential Efficiency Finance and Incentive Program	\$2,387,317	10%	103
Social Marketing and Education Program	\$1,039,000	4%	25,000
Combined Heat and Power and Distributed Generation	\$3,063,600	13%	3
Total	\$24,238,341	100%	
Notes/Sources Budget from Petition dated May 2, 2012, Exhibits 1-5 Projected Participants from RCR-EE-16			

2

3 **C. Program Benefits**

4

5 **Q. WHAT PROGRAM BENEFITS SHOULD BE ANALYZED IN SUPPORT**
 6 **OF A PROPOSAL FOR ENERGY EFFICIENCY PROGRAMS?**

7 A. Analysis should estimate the benefits that arise from the proposed program alone
 8 as well as estimating the combined benefits of the proposed program and other
 9 programs targeting the same energy usage. Since SJG is proposing incremental
 10 subsidies to those available through the NJCEP, it should consider the incremental
 11 benefits associated with those costs. Without consideration of the incremental
 12 benefits of the proposed programs, including incremental energy savings and
 13 other benefits discussed below, justification for the overall magnitude of the
 14 programs and the budget allocation among them is incomplete and insufficient.

15 **Q. HAS THE COMPANY QUANTIFIED THE INCREASE IN NATURAL**
 16 **GAS SAVINGS AS A RESULT OF ITS PROPOSED PROGRAMS?**

17 A. Yes. Exhibit 4 (“Exhibit 4”) from Mr. Bruce Grossman’s Testimony dated June
 18 26, 2012 provides the Company’s estimate of natural saving from its programs.
 19 However, as noted in the Company’s response to RCR-EE-17, the saving
 20 presented in Exhibit 4 were gross savings inclusive of the NJCEP programs.

1 Three of SJG’s proposed EE programs are structured to provide additional
2 monetary incentives to efficiency measures already available through NJCEP: the
3 Enhanced Residential HVAC Energy Efficiency Program; the Non-residential
4 Energy Efficiency Finance and Incentive Program; and the Combined Heat and
5 Power and Distributed Technology Program.

6 **Q. HAS THE COMPANY QUANTIFIED THE ENERGY SAVINGS IMPACTS**
7 **OF ITS PROPOSED PROGRAMS SEPARATE FROM THAT WHICH**
8 **WOULD BE EXPECTED WITH THE NJCEP PROGRAMS ALONE?**

9 A. Yes. In response to RCR-EE-17, the Company provided Exhibit 4 restated to
10 reflect net savings. The restated Exhibit 4 shows both its residential and
11 commercial program incentives will not lead to increased savings that are
12 incremental to the CEP with the exception OPOWER, which is not offered by the
13 CEP.

14 The RGGI Standards Order states that the utility shall “quantify and deduct from
15 the energy and capacity savings any free rider effects and the business as usual
16 benefits from homeowners and businesses installing Energy Efficiency or
17 Renewable Energy without the N.J.S.A. 48:3-98.1 benefits or incentives.”³ Since
18 the CEP was developed prior to the RGGI Law and pre-dates the Company’s
19 instant proposal, it would be appropriate to include the CEP in the baseline
20 against which the energy savings and other attributes of the Company’s proposed
21 programs would be evaluated, otherwise the savings claimed by SJG would be
22 “double counting” those obtained through CEP. In any event, it is essential that a
23 more rigorous technical evaluation that assesses incremental benefits be
24 conducted in order to meaningfully review the Company’s proposals. This is the
25 only way the Company can demonstrate that its programs are cost-effective.

26 **Q. BEYOND ITS FAILURE TO DEMONSTRATE THAT ITS INCENTIVES**
27 **ARE NECESSARY TO INCREASE PARTICIPATION, HAS THE**

³ RGGI Standards Order, page 6.

1 **COMPANY PROVIDED JUSTIFICATION FOR THE PROPOSED LEVEL**
2 **OF INCENTIVES?**

3 A. No. Determination of the incremental costs is one component that should be
4 considered when designing EE incentive levels. The Company has only provided
5 anecdotal and qualitative justification for its proposed incentives for the Enhanced
6 Residential HVAC Energy Efficiency Program.⁴ With regards to the Natural Gas
7 Vehicles Program, SJG provided incremental up-front costs, but provided no basis
8 as to how those costs were determined.⁵

9 ***D. Cost/benefit Analysis***

10
11 **Q. DID THE COMPANY CONDUCT A COST-BENEFIT ANALYSIS OF ITS**
12 **ENERGY EFFICIENCY PROPOSAL?**

13 A. No. Per the RGGI Minimum Filing Requirements for electric and gas public
14 utilities offering energy efficiency and conservation programs pursuant to
15 N.J.S.A. 48:3-98.1, small and pilot programs are generally exempted from the
16 requirement that an up-front cost-benefit analysis (“CBA”) be submitted.⁶
17 Because of the small size of SJG’s programs, SJG is not required to a submit cost
18 benefit analysis. SJG has indicated that it has not conducted any cost effectiveness
19 analyses.⁷

20 **Q. PLEASE EXPLAIN THE RATIONALE FOR CONDUCTING A COST-**
21 **BENEFIT ANALYSIS.**

⁴ Bruce Grossman Testimony of June 26, 2012, page 4.

⁵ See response to S-SJG-EE-014.

⁶ See RGGI Standards Order, Appendix A.

⁷ Response to RCR-EE-2.

1 A. Prospective CBA provides estimates of the aggregate economic benefits and costs
2 of EE from various perspectives. In my opinion, two tests are particularly useful:
3 (1) the TRC test and (2) the PA test.

4 The TRC test is essentially a test used to determine the overall economic cost-
5 effectiveness of EE programs in general. It is used throughout the industry as a
6 tool to screen EE programs for fundamental economic effectiveness. The TRC
7 test predicts the net benefits of EE based on its combined effects on both the
8 customers participating and those not participating in a program. The TRC costs
9 include both the utility costs and the participant costs. The TRC benefits are the
10 net “avoided” costs of supplying and delivering the energy that would have been
11 consumed absent EE, including those environmental benefits that have a
12 monetary value in the market. The benefits for the TRC also include “other fuel”
13 savings⁸, and non-energy benefits such as increased productivity, air quality
14 improvements, and reduced time and resources by the program administrator to
15 deal with late payments due to reduced energy bill burden on customers.

16 The PA test perspective is also very useful, but in a different way. Essentially, the
17 PA test indicates if program design decisions are effective in maximizing the
18 contributions obtained from participating customers and minimizing (or best
19 leveraging) the use of funds available from ratepayers. The PA test measures the
20 net costs of a program as a resource option based on the costs incurred by the
21 program administrator, including incentive costs but excluding the costs to
22 participants. The benefits are the same as in the TRC except that “other fuel” and
23 non-energy benefits for participants are excluded. The PA cost test determines
24 whether the benefits from the program specific to the entity implementing the
25 programs outweigh program investments. This is a key indicator to find out
26 whether ratepayer money is spent meaningfully, or if the program designs have

⁸ For example, a gas energy efficiency program might result not only in saving gas through more thermally efficient furnaces, but in saving electricity, such as with less fan motor usage and/or more energy-efficient furnace fan motors.

1 successfully maximized the contributions that come from directly-participating
2 customers.

3 Although not a bright-line standard, a benefit-cost ratio less than 1.0 for either of
4 these tests is generally considered indicative that the program is not cost-effective.
5 Therefore, it is my recommendation that SJG should perform a cost/benefit
6 analysis for all of its proposed EE programs, with the exception of OPOWER.

7 **Q. HAVE COST-BENEFIT ANALYSES BEEN CONDUCTED ON THE**
8 **NJCEP PROGRAMS FOR WHICH SJG PROPOSES TO PROVIDE**
9 **ENHANCED INCENTIVES?**

10 A. Yes. In June 2012, Applied Energy Group (“AEG”) released an evaluation of the
11 NJCEP.⁹ The AEG analysis indicated low cost effectiveness of the NJCEP
12 WARMAdvantage and HPwES programs even before SJG incremental
13 incentives, achieving 0.68 and 0.19 TRC ratios, respectively.¹⁰ It is reasonable to
14 expect that an increase in the incentives for these programs through a
15 supplementary utility program with redundant administrative structure (i.e. SJG’s
16 EEP II) would not improve their cost effectiveness.

17 **Q. HAS A COST-BENEFIT ANALYSIS BEEN CONDUCTED FOR THE**
18 **OPOWER PROGRAM?**

19 A. Yes. New Jersey Natural Gas Company (“NJNG”) conducted an analysis of its
20 OPOWER program. SJG “does not anticipate applying the OPOWER program in
21 a manner that is appreciably different from NJNG.”¹¹ In NJNG’s filing in BPU
22 Docket GO12070640, NJNG shows that its OPOWER program is marginally
23 cost-effective with a PA test ratio of 1.14 and a TRC test ratio of 1.41.¹² I believe

⁹ Applied Energy Group. *Evaluation of New Jersey’s Clean Energy Programs*. Developed for the New Jersey Office of Clean Energy (June 11, 2012), page 26.

¹⁰ *Id.* page 2.

¹¹ Bruce Grossman Testimony of June 26, 2012, page.7.

¹² See *IM/O New Jersey Natural Gas Company*, BPU Dkt. No. GO12070640, Petition (July 6, 2012), Exhibit 13.

1 that the OPOWER program serves a useful educational purpose that is not
2 reflected in the CBA results and not offered by the CEP.

3 ***E. Enhanced Residential HVAC Energy Efficiency Program***
4

5 **Q. PLEASE STATE YOUR RECOMMENDATION FOR THE ENHANCED**
6 **RESIDENTIAL HVAC ENERGY EFFICIENCY PROGRAM.**

7 A. This program offers participants financing through the Company, which is not
8 available from the CEP. However, in light of the poor cost effectiveness of the
9 CEP programs that SJG proposes to enhance (WARMAvantage and HPwES) as
10 determined by AEG and discussed in my testimony above, I recommend that the
11 Board reject the SJG's Enhanced HVAC Energy Efficiency Program.

12 At a minimum, the Enhanced HVAC Energy Efficiency Program should not be
13 approved until and unless SJG: (1) demonstrates cost-effectiveness; (2)
14 documents incremental savings above the savings associated with implementation
15 of the CEP measures alone; and (3) shows why additional program support is
16 necessary to incent increased customer participation in the CEP's
17 WARMAvantage or Cool Advantage program (or modifications of those
18 programs, per a new CEP structure in 2013) in SJG's area. Furthermore, I
19 suggest such program restructuring be informed by insights consistent with the
20 recommendations of a third party evaluation.

21 **Q. HAS AN ANALYSIS BEEN CONDUCTED FOR THE \$900 INCENTIVE**
22 **FOR QUALIFIED WARM ADVANTAGE HVAC EQUIPMENT?**

23 A. Yes, NJNG has conducted an analysis of its current \$900 incentive for qualified
24 WARM Advantage HVAC equipment referenced by SJG in its June 26, 2012
25 petition.¹³ In its filing, NJNG has lowered its incentive for a furnace installation
26 from \$900 to \$300 to reflect new Department of Energy (DOE) minimum furnace

¹³ Bruce Grossman Testimony of June 26, 2012, page 4.

1 efficiency standards that are scheduled for May 2013.¹⁴ While NJNG maintains a
2 \$900 incentive for participants who install both high efficiency heating and high
3 efficiency water equipment at the same time, SJG has not made that distinction in
4 its program description.¹⁵ If the Board approves this program, SJG should also
5 consider lowering its incentive level to match changes with DOE furnace
6 efficiency standards.

7 **F. Social Marketing and Education Program (“OPOWER”)**
8

9 **Q. SHOULD THE SOCIAL MARKETING AND EDUCATION PROGRAM**
10 **PROCEED?**

11 A. Yes. While SJG has not conducted a cost-effectiveness analysis of its Social
12 Marketing and Education program, NJNG has an OPOWER pilot that is
13 marginally cost effective per the Program Administrator Cost Test as discussed
14 above.

15 This program should proceed because it offers a service that (1) has educational
16 value and (2) is not available from CEP. However as part of the evaluation
17 process for this pilot project, SJG should determine whether and to what extent
18 the customers participating in OPOWER use existing rebates from the CEP to
19 address the possibility of double counting savings that should be attributable to
20 other programs, but potentially claimed by OPOWER.

21 In addition, the Company should not extrapolate the OPOWER savings to 20
22 years as it indicated in its response to RCR-EE-40. As provided by the Company
23 as Part 7 of RCR-EE-9, the authors of a Lawrence Berkeley National Laboratory
24 study, which examined participant response over 20 months cited by the
25 Company cautions:

¹⁴ See I/M/O New Jersey Natural Gas Company, BPU Dkt. No. GO12070640, Direct testimony of T. Masaro (July 6, 2012), page 15.

¹⁵ See I/M/O New Jersey Natural Gas Company, BPU Dkt. No. GO12070640, Direct testimony of T. Masaro (July 6, 2012), page 16.

1 The estimates of energy savings due to the program are only
2 valid for the study duration, and cannot be extrapolated outside
3 of the study duration to future years without making strong
4 assumptions about the program.¹⁶

5 **G. Natural Gas Vehicles Program**
6

7 **Q. PLEASE STATE YOUR CONCERNS WITH THE COMPANY'S**
8 **PROPOSED NATURAL GAS VEHICLES GRANT PROGRAM.**

9 A. The Natural Gas Vehicles Grant program is a load building program and would
10 generate revenues for the Company and increase gas use by 77,313 Decatherms.¹⁷
11 The Company proposes to provide funding for the complete costs to convert 120
12 fleet vehicles to run on compressed natural gas. While such a conversion is
13 expected to result in less consumption of gasoline, the result is that Company will
14 expect to see more revenues through the increased usage of natural gas to power
15 the converted vehicles.¹⁸ Ratepayer funding through the RGGI EE program
16 structure should not be used to support a program that ultimately provides the
17 Company with additional revenues through what is essentially a load building
18 program.

19 As noted in the 2011 New Jersey Energy Master Plan ("EMP") dated December
20 6, 2011, "New Jersey's gas utilities should provide guidance on the construction,
21 operation and maintenance of CNG fueling stations for business fleets."¹⁹ SJG
22 should continue to provide such analysis to the State rather than pay for the up-
23 front cost of upfitting vehicles.

¹⁶ Todd, A., Schiller, S., Goldman, C. *Analysis of PSE's Pilot Energy Conservation Project: "Home Energy Reports"* Lawrence Berkeley National Laboratory (October 17, 2011), page 11.

¹⁷ See response to RCR-EE-028

¹⁸ See response to S-SJG-EE-012

¹⁹ EMP, page 135.

1 **H. *Non-Residential Energy Efficiency Finance and Incentive Program***

2 **Q. PLEASE PRESENT YOUR CONCERNS WITH THE COMPANY'S**
3 **PROPOSED NON-RESIDENTIAL EE FINANCE AND INCENTIVE**
4 **PROGRAM.**

5 A. The Company has not explained why doubling participant incentives available
6 through the CEP is desirable or necessary. There is no analysis showing that
7 increases in incentives would increase participation. In fact, the Company in its
8 response to RCR-EE-17 shows no incremental energy savings attributable to the
9 program net of the existing CEP program. The Company's matching incentive is
10 redundant to the CEP. This has the effect of reducing the cost-effectiveness of the
11 program, since additional incentives and administrative expenses would be
12 included without gaining additional savings.

13 In addition to the matching incentives, SJG's Non-Residential Energy Efficiency
14 Finance and Incentive program would offer financing, which is not available from
15 the CEP. Although SJG has not demonstrated that its program will increase
16 savings beyond what would occur from existing CEP Commercial and Industrial
17 programs alone, the financing component of this program has a reasonable
18 likelihood of providing incremental benefits. This program could be allowed to go
19 forward, but only if SJG can show that the program will provide incremental
20 savings above the savings associated with implementation of the CEP measures
21 alone, and that the additional incentives from SJG are necessary to incent
22 customer participation.

23 **I. *Combined Heat and Power and Distributed Generation Technology Program***

24

25 **Q. PLEASE PRESENT YOUR ASSESSMENT OF THE COMPANY'S**
26 **COMBINED HEAT AND POWER AND DISTRIBUTED GENERATION**
27 **TECHNOLOGY PROGRAM.**

1 A. The Combined Heat and Power and Distributed Generation Technology Program
2 should not be allowed to proceed since NJCEP is currently restructuring the
3 existing CHP program.²⁰ As noted in the response to S-EE-026, the Company did
4 not perform any analyses to determine the level of rebates, grants, or other direct
5 incentives (over and above existing CEP rebates). Moreover, as noted in the
6 response to S-EE-027, the Company is unable to calculate the therm usage and net
7 energy savings “without specific information”. The Company does provide an
8 estimate of increased natural gas consumption in its response to RCR-EE-28. In
9 addition, the 2011 EMP cautions that “Some of these programs, such as CHP,
10 may increase, not decrease the State’s use of natural gas.”²¹

11 The CEP is currently revamping its CHP program as noted by the Company and
12 as noted in its response to S-EE-028. However, the Company does not intend to
13 offset the cost of its program with the increased revenues from CHP projects.
14 Thus, SJG ratepayers could potentially be faced with providing incentives to CHP
15 projects in the SJG territory through both the CEP and SJG programs.

16 **J. Program Evaluation**
17

18 **Q. PLEASE ASSESS SJG’S PROGRAM EVALUATION.**

19 A. It is unknown if any of the SJG programs in their current form have the potential
20 to be cost-effective, since the Company has not conducted any cost-effectiveness
21 analyses. As noted above, a number of the programs offer incremental incentives
22 to those already offered by the CEP. Some form of program evaluation is required
23 to determine if SJG programs may be cost-effective if structured differently. I
24 recommend that an evaluation be conducted to assess the efficacy of the overall
25 program structure.

²⁰ See <http://www.njcleanenergy.com/commercial-industrial/programs/combined-heat-power/combined-heat-power-and-fuel-cells-large-scale-pr>

²¹ EMP, page 8.

1 Any SJG EE programs that the Board decides to approve should be subjected to
2 third party evaluation. This evaluation should consider, at a minimum: (1)
3 whether or not improvements are available that could improve program overall
4 cost-effectiveness; (2) how the SJG program structure can best complement the
5 CEP structure and incentive design, when it becomes more clear what the CEP
6 structure will be; and (3) how to document incremental savings above the savings
7 associated with implementation of the CEP measures alone.

8 SJG is spending 60% of the program budget on the residential HVAC programs
9 (which are, as discussed above, unlikely to provide net benefits to ratepayers),
10 10% on the commercial finance programs, 26% on the two load building
11 programs, and 4% the OPOWER pilot. SJG's evaluation of its energy efficiency
12 programs should demonstrate the Company's process to create the most
13 appropriate programs to serve the Company's territory that are both cost-effective
14 and incremental to existing programs.

15 **K. CEP Program Developments**
16

17 **Q. DOES SJG DOCUMENT HOW THE PROPOSED EEP EXTENSION**
18 **WILL CONTRIBUTE TOWARDS MEETING NJ EMP GOALS?**

19 A. No, not with any specificity. The EMP contemplates a shift from rebates to
20 increased reliance on financing programs within the CEP.²² It is not clear how
21 SJG's proposed financing incentives would interface with the CEP programs if
22 the latter are transformed to rely on financing.

23 Even after the SJG evaluation is complete, the Board should not approve any of
24 the SJG programs, other than OPOWER, until (1) the Board has determined the
25 direction and structure of the NJCEP at the end of the currently ongoing
26 Comprehensive Energy Efficiency and Renewable Energy Resource Analysis

²² EMP, page 119.

1 (“CRA”) process;²³ and (2) the Board accepts a set of EE programs recommended
2 by the new CEP Program Administrator (“CEP PA”).

3 **L. Source of Funding**
4

5 **Q. HOW SHOULD PROGRAM FUNDING SOURCES BE IDENTIFIED AND**
6 **ACCOUNTED FOR?**

7 A. For any SJG EE programs that the Board decides to approve, the program
8 descriptions should clearly state the source of funding (i.e., CEP or SJG). The
9 Company’s response to S-SJG-EE-025 suggests that a participant in the CEP’s
10 Direct Install Program would receive the CEP \$75,000 incentive from SJG, which
11 would then assign the incentive to reduce the principal in the Company’s
12 repayment plan. For the Non-Residential Energy Efficiency Finance and Incentive
13 Program, a participant would have both the CEP and SJG incentive assigned to
14 SJG in order to reduce the principal outstanding. If the Board approves these
15 programs, the program language should be clear that SJG does not have the ability
16 to disburse payment of incentives currently paid by OCE without further
17 authorization from the Board.

18 **V. RECOMMENDATIONS**

19 **Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE**
20 **CURRENT PETITION?**

21 A. In summary, I recommend the following:
22 1. The Board reject the SJG’s proposed EEP II as currently structured, other than the
23 OPOWER Program, because the Company has not demonstrated that EEP II is
24 cost-effective and the Company has not demonstrated that the programs would
25 result in incremental savings beyond existing CEP programs.

²³ See I/M/O the Comprehensive Energy Efficiency and Renewable Energy Resource Analysis for the 2013-2016 Clean Energy Program, BPU Docket No.EO11050324V.

1 2. At a minimum, SJG's proposed residential programs should not be approved until
2 and unless (1) they demonstrate cost-effectiveness, (2) they document incremental
3 savings above the savings associated with implementation of the CEP measures
4 alone, and (3) they show why additional program support from SJG is necessary
5 to incent increased customer participation in the CEP HPwES and
6 WARMAdvantage programs (or modifications of those programs, per the new
7 CEP structure in 2013) in SJG's area. Furthermore, I suggest such program
8 restructuring be informed by insights consistent with the recommendations of a
9 third party evaluation.

10 Because of the size of its programs, the Company is not required to show cost
11 effectiveness under the RGGI Minimum Filing Requirements.²⁴ Nonetheless,
12 SJG should conduct cost-benefit analysis of its proposed programs, and SJG
13 should at least demonstrate incremental savings and increased participation in the
14 CEP as a result of its proposed programs.

15 3. The Board should reject the Enhanced Residential HVAC Energy Efficiency
16 Program since the Company has not demonstrated that the program is cost
17 effective or results in incremental savings for several of the CEP residential
18 programs. However, if the Board approves this program, the Company should
19 reduce its incentive from \$900 to \$300 for high efficiency furnace equipment.

20 4. The OPOWER Program should be allowed because it offers a service that (1) has
21 educational value and (2) is not available from the CEP. The Company should
22 conduct ongoing evaluation of the progress of this program. As part of that
23 ongoing evaluation for this program, SJG should determine if any observed
24 OPOWER savings are attributable to other programs.

25 5. The Natural Gas Vehicles Grant Program should not be funded through the RGGI
26 EE program structure. This program increases gas consumption and Company
27 sales revenues.

²⁴ See RGGI Standards Order, Appendix A, paragraph e.

- 1 6. The Non-Residential EE Financing Program is structured to offer financing,
2 which is not available from CEP. The Company has not demonstrated that the
3 program is cost effective or results in incremental savings for several of the CEP
4 Commerical and Industrial programs. This program may provide incremental
5 benefits because it is targeted to reducing “access to capital” barriers through a
6 financing repayment program. However, this program should only be allowed to
7 go forward if SJG can show that the additional incentives from SJG (the value of
8 the financing repayment program) are necessary to incent customer participation
9 in SJG’s area.
- 10 7. The Combined Heat and Power Program should not be funded through the RGGI
11 EE program structure. This program increases natural gas consumption and
12 Company sales revenues.
- 13 8. Aside from the OPOWER Program, the Board should not approve SJG EEP II
14 until (1) the Board has determined the direction and structure of the CEP at the
15 end of the currently ongoing CRA process; and (2) the Board accepts a set of EE
16 programs recommended by the new CEP Program Administrator. At that time, a
17 re-designed SJG EEP II, if developed, should be reviewed to ensure it
18 compliments, and not replicates, new CEP offerings.
- 19 9. Any SJG EE programs that the Board decides to approve should be subject to
20 third party evaluation. This evaluation should consider, at a minimum, (1)
21 whether or not the SJG-specific components of the programs promote additional
22 participation and savings above what the NJCEP would achieve without SJG
23 program additions, (2) whether or not improvements are available that could
24 demonstrate the program’s overall cost-effectiveness as measured by both the
25 TRC and PA tests, and (3) specifically, how the SJG program structure can best
26 complement the CEP structure and incentive design, when it becomes more clear
27 what the CEP structure will be.
- 28 10. For any SJG EE programs that the Board decides to approve, the program
29 descriptions should clearly state the source of funding (i.e., CEP or SJG). SJG

1 funds should not be used to pay for services that the CEP otherwise would
2 provide.

3 I do not recommend that SJG forego future EE efforts. However, any future
4 proposal should present programs that are well designed, complement the soon-
5 to-be-modified CEP program structures, and are clearly cost-effective.

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

7 A. Yes, it does. However, I reserve my right to amend my testimony subject to
8 updated information from the Company.

9

APPENDIX – MC-1: RESUME OF MAXIMILIAN CHANG

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PROFESSIONAL EXPERIENCE

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

Consults and provides analysis of technologies and policies, electric policy modeling, evaluation of air emissions of electricity generation, and other topics including energy efficiency, consumer advocacy, environmental compliance, and technology strategy within the energy industry.

Conducts analysis in utility rate-cases focusing on reliability metrics and infrastructure issues and analyzes the benefits and costs of electric and natural gas energy efficiency measures and programs.

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

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

The Penobscot Group, Inc, Boston, MA. Analyst, 1994-2000.

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

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

Teaching Assistant for Environmental Management I and Ocean Environments.

Brigham and Womens Hospital, Boston, MA. Cancer Laboratory Technician, 1992 - 1994.

Studied the biological mechanism of tumore eradication in mouse and human models.

Organized and performed immunotherapy experiments for experimental cancer therapy.

Analyzed and authored results in peer-reviewed scientific journals.

EDUCATION

Harvard University, MS, Environmental Science and Engineering, 2000.

Cornell University, BA, Biology/Classics, 1992.

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