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TABLE OF CONTENTS

I.	WITNESS IDENTIFICATION AND PURPOSE OF TESTIMONY	1
II.	SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.....	3
III.	INTRODUCTION.....	4
IV.	CBA REQUIRED UNDER THE CEA.....	12
V.	THE COMPANY’S NJCT RESULTS ARE OVERSTATED	15
VI.	THE COMPANY’S CBAS ARE UNRELIABLE.....	20
a.	PROPOSED AVOIDED CAPACITY COST BENEFITS	20
b.	PROPOSED DRIPE BENEFITS	22
c.	PROPOSED VOLATILITY BENEFITS.....	26
d.	PROPOSED ENVIRONMENTAL BENEFITS	30
e.	CBAS ARE INCOMPLETE AND DO NOT ADEQUATELY ADDRESS RATE IMPACTS AND OMIT UTILITY RETURNS ON INVESTMENT FROM COSTS ..	35
VII.	RECOMMENDATIONS AND CONCLUSIONS	39

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1 DIRECT TESTIMONY OF

2 DAVID E. DISMUKES, PH.D.

3 ON BEHALF OF THE

4 NEW JERSEY DIVISION OF RATE COUNSEL

5 BPU DOCKET NO. QO19010040 and GO20090622

6 **I. WITNESS IDENTIFICATION AND PURPOSE OF TESTIMONY**

7 **Q. WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?**

8 A. My name is David E. Dismukes. My business address is 5800 One Perkins Place Drive,
9 Suite 5-F, Baton Rouge, Louisiana, 70808.

10 **Q. WOULD YOU PLEASE STATE YOUR OCCUPATION AND CURRENT PLACE**
11 **OF EMPLOYMENT?**

12 A. I am a Consulting Economist with the Acadian Consulting Group (“ACG”), a research
13 and consulting firm that specializes in the analysis of regulatory, economic, financial,
14 accounting, statistical, and public policy issues associated with regulated and energy industries.
15 ACG is a Louisiana-registered partnership, formed in 1995, and is located in Baton Rouge,
16 Louisiana.

17 **Q. DO YOU HOLD ANY ACADEMIC POSITIONS?**

18 A. Yes. I am a full Professor, Executive Director, and Director of Policy Analysis at the
19 Center for Energy Studies, Louisiana State University (“LSU”). I am also a full Professor in the
20 Department of Environmental Sciences and the Director of the Coastal Marine Institute in the
21 School of the Coast and Environment at LSU. I also serve as a member of the graduate research
22 faculty at LSU. Appendix A provides my academic curriculum vitae, which includes a full

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1 listing of my publications, presentations, pre-filed expert witness testimony, expert reports,
2 expert legislative testimony, and affidavits.

3 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

4 A. I have been retained by the New Jersey Division of Rate Counsel (“Rate Counsel”) to
5 provide an expert opinion to the Board of Public Utilities (“BPU” or “Board”) on the petition by
6 New Jersey Natural Gas Company (“NJNG” or “The Company”) to implement energy efficiency
7 programs, with associated cost recovery, pursuant to the Clean Energy Act (“CEA”).¹ In my
8 testimony I assess the cost benefit analysis (“CBA”) included in the Company’s filing in the
9 context of the CEA and relevant Board orders, and the ongoing process through the Utility
10 Working Group (“UWG”) to establish consistent programs and procedures pursuant to the CEA.
11 I also review the Company’s analysis of the potential ratepayer impact of the proposed program.

12 **Q. HAVE YOU PREPARED ANY EXHIBITS IN SUPPORT OF YOUR**
13 **ASSESSMENT AND RECOMMENDATIONS?**

14 A. Yes. In support of my direct testimony seven schedules were prepared by me or under
15 my direct supervision. They are:

- 16 • Schedule DED-1: Summary of Proposed Program Budgets and CBA Results
- 17 • Schedule DED-2: NJNG EE and Infrastructure Program Investments: 2009-2019
- 18 • Schedule DED-3: NJNG and Average New Jersey Natural Gas Distribution Rates
- 19 • CONFIDENTIAL Schedule DED-4: Company's Henry Hub, Tetco M3 and Tetco M3
20 Basis Prices: 2018-2040
- 21 • Schedule DED-5: Partially Corrected NJCT CBRs
- 22 • Schedule DED-6: Effects of Fine Particulate Emissions (PM2.5)

¹ P.L. 2018, c. 17; N.J.S.A. 48:3-87.8 et al.

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- 1 • Schedule DED-7: Volatility Cost Studies Surveyed by the Company

2 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?**

3 A. The remainder of my testimony is organized into the following sections:

- 4 • Section II: Summary of Conclusions and Recommendations
- 5 • Section III: Introduction
- 6 • Section IV: CBA Required under the CEA
- 7 • Section V: The Company’s NJCT Results are Overstated
- 8 • Section VI: The Company’s CBAs are Unreliable
- 9 • Section VII: Conclusions and Recommendations

10 **II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

11 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS?**

12 A. The Company’s benefit-to-cost analysis using the New Jersey Cost Test (“NJCT”)

13 methodology shows that three utility-led programs, Quick Home Energy Check-up (“QHEC”),

14 Moderate Income Weatherization, and Energy Management are not cost-effective. However, I

15 find that the benefit-to-cost ratios the Company calculates for its proposed programs under the

16 NJCT is overstated and unreliable, as is its other CBA. I have prepared a partially corrected

17 version of the Company’s NJCT. My partially corrected analysis indicates that two additional

18 utility-led programs, Engineered Solutions and Hybrid Heat, and one core program, Home

19 Performance with Energy Star (“HPwES”), also fail the test for cost-effectiveness under the

20 NJCT.² I do not oppose the adoption of the QHEC, Moderate Income Weatherization, Energy

21 Management, HPwES or Engineered Solutions programs since these programs, while having

22 benefit-cost ratios less than one, either (a) represent the continuation of an existing program, (b)

² I adopt Dr. Hausman’s categorization of core and utility-led programs. Hausman Direct Testimony, Table 1 and Table 2.

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1 serve the needs of low-income customers, or (c) ensure universal access to energy efficiency.
2 However, I do recommend the Board reject the Hybrid Heat program since it is not a
3 continuation of an existing program, is not intended to promote the adoption of other measures,
4 nor does it serve the needs of low-income customers or ensure universal access to energy
5 efficiency. Additional reasons why the Board should reject this program are addressed in the
6 Direct Testimony of Rate Counsel witness Ezra D. Hausman, PhD.³

7 In addition, I recommend that the Company's existing Conservation Incentive Plan
8 ("CIP") be modified so as to prevent the Company from recouping lost revenues attributable to
9 the COVID pandemic and resulting economic recession as these lost revenues are unrelated to
10 the Company's conservation efforts and SAVEGREEN program. I recommend that the Board
11 adopt a cap on the CIP of 4.0 percent of variable margin revenue for the first year of the program
12 only to assure that these COVID-related revenue losses are not assessed upon ratepayers during
13 this critical recovery period. This cap is consistent with the terms included in the recent
14 settlement agreement between parties that was included in the Board's Order Adopting
15 Stipulation between PSEG, Board Staff, Rate Counsel and certain intervenors in Docket Nos
16 GO18101112 and EO18101113 "in light of the current pandemic."⁴

17 **III. INTRODUCTION**

18 **Q. PLEASE DISCUSS THE COMPANY'S REQUEST**

19 A. The Company is requesting the continuation and expansion of its existing energy
20 efficiency program, referred to as SAVEGREEN, in compliance with the requirements of the

³ Hausman Direct Testimony, 15:1 - 16:15

⁴ I/M/O The Petition of Public Service Electric and Gas Company for Approval of Its Clean Energy Future Energy Efficiency ("CEF-EE") Program on a Regulated Basis BPU Dkt. Nos. GO18101112 & EO18101113, Order at 20, 23 (Sept. 23, 2020).

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1 CEA.⁵ The overall portfolio is comprised of two types of measures: core utility programs and
2 additional utility led programs.⁶ The Company notes that its request, and the minimum filing
3 requirements supporting its filing, reflect the current state of the UWG activities.⁷ The Company
4 notes that it intends to refine its strategies, likely at some point in the undefined future, to
5 incorporate any recommendations that arise from the UWG.⁸

6 **Q. HAS THE COMPANY ADDRESSED HOW ITS PROGRAMS CONFORM TO**
7 **THE CEA?**

8 A. Yes. Ezra D. Hausman, PhD, another expert appearing in this proceeding on the behalf
9 of Rate Counsel will address how the Company's programs conform with the CEA as well as
10 several other program design issues.⁹

11 **Q. CAN YOU PLEASE DISCUSS HOW CORE PROGRAMS DIFFER FROM**
12 **UTILITY LED INITIATIVES?**

13 A. Yes. The core programs are a suite of programs designated by the Board that must be
14 offered by each the New Jersey utilities.¹⁰ Utility led initiatives represent additional measures
15 that have been developed by the utilities and proposed as additional offerings.¹¹

16 **Q. PLEASE IDENTIFY THE COMPANY'S BUDGET REQUEST FOR THESE**
17 **EFFICIENCY OFFERINGS.**

18 A. Schedule DED-1 summarizes the Company's budget proposals for its proposed programs
19 over the next three years. As shown in Schedule DED-1, the Company is proposing a total

⁵ Peracchio Direct Testimony, 3: 3-11.

⁶ Peracchio Direct Testimony, 5: 23-24.

⁷ Peracchio Direct Testimony, 6: 2-3.

⁸ Peracchio Direct Testimony, 6: 4-5.

⁹ Hausman Direct Testimony.

¹⁰ Hausman Direct Testimony, 8:19-12:1.

¹¹ Direct Testimony of Ezra D. Hausman, Ph.D., 8:19-12:1.

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1 program budget of \$258.2 million. This includes \$184.7 million for core programs, \$70.1
2 million for utility led programs and \$3.5 million of portfolio costs.¹²

3 **Q. HAS THE COMPANY ESTIMATED THE RATE IMPACTS ASSOCIATED**
4 **WITH ITS PROGRAM OFFERINGS?**

5 A. Yes. The Company is seeking recovery for the costs necessary to deliver the
6 SAVEGREEN measures to its customers including the costs of all customer grants and
7 incentives, incremental operation and maintenance (“O&M”) expenses, investment-related
8 carrying costs and income taxes.¹³ The Company estimates a total revenue requirement of
9 \$228.2 million for 2021-2036. This equates to an approximately \$15 million per year revenue
10 requirement that, if approved, will be recovered through the Company’s energy efficiency rider
11 (Rider F).¹⁴

12 **Q. IS THIS THE ONLY SET OF PUBLIC POLICY INVESTMENTS BEING MADE**
13 **BY THE COMPANY?**

14 A. No. The Company’s SAVEGREEN program has been in existence since 2009 and has
15 been expanded several times since its inception.¹⁵ Over the same period of time (dating back to
16 the last economic recession), the Company has spent hundreds of millions in pipeline
17 replacement and resiliency investments. Schedule DED-2 summarizes the EE and infrastructure
18 program investments made by the Company over the past decade. As shown in the Schedule, the
19 Company has received approval for as much as \$1.1 billion in new efficiency, resiliency, and

¹² These figures reflect the program budgets as reported in Exhibit P-5. The actual budget figure may be higher. Hausman Direct Testimony, p, 10, n. 15.

¹³ Peracchio Direct Testimony, 4:18-20.

¹⁴ Peracchio Direct Testimony, 4: 21-22.

¹⁵ Peracchio Direct Testimony, 4:12-14.

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1 reliability investments. The current proposal, as noted earlier, will add an additional \$258.2
2 million to those already considerable increases in costs which will be passed on to customers.

3 **Q. HOW HAS THE EXPANSION OF UTILITY-SPONSORED EE AND**
4 **INFRASTRUCTURE PROGRAMS IMPACTED ITS RETAIL RATES?**

5 A. Schedule DED-3 charts the trends in the Company's historic retail rates and compares
6 those to the New Jersey averages. This chart estimates the trends in historic base rates, not total
7 rates that include commodity gas charges. The chart show that the base rates paid by NJNG's
8 customers have been significantly higher than the New Jersey average in each of the last nine
9 years, and NJNG's retail base rates were 34 percent above the New Jersey average last year.

10 **Q. HAS THE COMPANY PROVIDED COST BENEFIT ANALYSES TO SUPPORT**
11 **ITS PROPOSED EFFICIENCY INVESTMENTS IN THIS PROCEEDING?**

12 A. Yes. The Company has provided CBAs per the Board's minimum filing requirements.
13 The CBAs examine the cost effectiveness of the individual measures in the Company's overall
14 energy efficiency proposal (both core and utility-led programs). The CBAs also examine the
15 overall portfolio cost-effectiveness.

16 **Q. EXPLAIN THE IMPORTANCE OF CBAs.**

17 A. The CBAs that are used in this proceeding have historically been referred to more
18 generally as "cost-effectiveness" tests. These tests, collectively, are designed to examine the cost
19 effectiveness of energy efficiency programs from a variety of stakeholder perspectives. Most
20 importantly, these tests subject efficiency program cost and benefits to rigorous analysis to
21 ensure that program dollars are being spent efficiently. Thus, these tests, or overall CBA results,
22 are important in assessing the merits of adopting various individual efficiency measures and

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1 portfolios, particularly given the total budget amounts that are in question in this proceeding, and
2 other utility CEA filings that have been made before the Board.

3 **Q. HAS THE BOARD ISSUED ANY GUIDELINES TO UTILITIES ON HOW A**
4 **CBA SHOULD BE CONSTRUCTED FOR THEIR RESPECTIVE CEA-EE FILINGS?**

5 A. Yes. On August 24, 2020, the Board issued an Order (referred to hereinafter as the “NJ
6 Cost Test Order”) adopting the New Jersey Cost Test as the primary screening mechanism for
7 EE programs that were filed by utilities in compliance with the CEA.¹⁶ The Order outlined the
8 inputs and methods to be used for the NJCT. In addition, based on Staff’s recognition that the
9 “NJCT may not include the full range of possible benefits and costs that could be included in a
10 primary test,” the Board’s Order required the submission of five other cost-effectiveness tests
11 that have historically been used to evaluate EE programs over the past several decades.¹⁷

12 **Q. PLEASE DISCUSS THESE HISTORIC EE COST EFFECTIVENESS TESTS.**

13 A. The California Energy Commission first published its Standard Practices Manual
14 (“CSPM”) for estimating the cost-effectiveness of energy efficiency programs in 1983, and
15 updated this manual in 2001.¹⁸ Over time, this manual has come to serve as the foundation for
16 evaluating efficiency measure cost effectiveness through the U.S. and even abroad. The manual
17 identified five standard cost-effectiveness tests that estimate efficiency measure/program cost
18 effectiveness from various perspectives (i.e., program participants, utilities, non-participating
19 customers, society). These cost-effectiveness tests are:

¹⁶ I/M/O Implementation of the CEA - NJ Cost Test, BPU Dkt. Nos. QO19010040 and QO20060389 Order at 4-8, (August 24, 2020) (the “NJ Cost Test Order”).

¹⁷ Id. at 7, 8.

¹⁸ California Standards and Practice Manual: Economic Analysis of Demand-side Programs and Projects, California Public Utilities Commission, October 2, 2001, (“CSPM”), 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).

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- 1 • **The Program Administrator Cost Test (“PAC”)** examines the cost effectiveness of
2 efficiency programs from the perspective of a utility, or third-party administrator like the
3 Board’s Division of Clean Energy. Under the PAC, costs are defined to include the
4 program costs incurred by the administrator, the cost of incentives paid to consumers, and
5 the increase in energy supply costs (if any), while the benefits are defined as the costs
6 avoided by the program administrator as a result of the program.¹⁹
- 7 • **The Participant Cost Test (“PCT”)** examines the cost effectiveness of efficiency
8 programs from the perspective of program participants. Under the PCT, costs and
9 benefits are limited quantifiable costs and benefits to a customer who participates in a
10 program due to participation in that program.²⁰
- 11 • **The Ratepayer Impact Measure Test (“RIM”)** examines the cost effectiveness of
12 efficiency programs from the perspective of ratepayers that may not be participating in an
13 individual efficiency plan. Under the RIM, benefits are calculated as the savings from
14 avoided costs, while the costs are calculated as program costs incurred by the utility,
15 including customer incentives, and the decrease in revenue resulting from declines in
16 energy consumption resulting from the program.²¹
- 17 • **The Total Resource Cost Test (“TRC”)** examines the overall cost effectiveness of the
18 program from a combined utility (administrator) and participants perspective considering
19 all program costs and benefits.²²

¹⁹ California Standards and Practice Manual: Economic Analysis of Demand-side Programs and Projects, California Public Utilities Commission, October 2, 2001, (CSPM), p. 23; NJ Cost Test Order, Appendix A, p.6.

²⁰ CSPM, p. 8. NJ Cost Test Order, Appendix A, p.7.

²¹ CSPM, p. 13. NJ Cost Test Order, Appendix A, p.7.

²² CSPM, p. 18. NJ Cost Test Order, Appendix A, p.7.

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- 1 • **The Societal Cost Test (“SCT”)** was originally included in the CSPM as a variant of the
2 TRC test. It often examines the costs and benefits from a societal perspective, often
3 considering external costs and benefits, and frequently using alternative discount rates.²³
4 Traditionally, entities requiring the evaluation of the SCT have independently determined
5 which non-ratepayer/non-administrator costs and benefits to include in the SCT, how
6 those broader societal costs and benefits are valued, and other details of the SCT.²⁴

7 **Q. HOW DOES THE NJCT COMPARE TO THESE CSPM TESTS?**

8 A. The NJCT takes into account many of the same considerations included in the total
9 resource cost test and the societal test. Unlike the SCT, however, the NJCT is customized to be
10 consistent with, and reflect, the considerations included in the specific legislation establishing
11 statewide energy efficiency targets (e.g., the CEA).²⁵ In my opinion, the relevant externalities
12 that should be considered in developing energy efficiency programs under the CEA should be
13 guided by the CEA. The text of the CEA defines the relevant externalities that should be
14 considered in defining eligible programs, and programs should not be adopted primarily due to
15 other externalities. The Board then conducted a rulemaking proceeding and sought stakeholder
16 commentary on the appropriate means of accounting for non-energy benefits under the CEA.
17 The NJCT is the result of that proceeding and was developed with the express purpose of taking
18 into account, and assigning appropriate weight to, energy and non-energy benefits and costs
19 under the CEA. All other variants of the SCT, including the SCT submitted by the Company,
20 should be dismissed.

²³ See NJ Cost Test Order, Appendix A, p. 6: “The SCT is a variant of the TRC. It goes beyond the TRC in that it attempts to quantify the change in the total resource costs to society as a whole rather than to only the service territory (the utility and its ratepayers).”

²⁴ CSPM, p. 6; NJ Cost Test Order, Appendix A, p. 6.

²⁵ NJ Cost Test Order at 4-5.

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1 **Q. PLEASE SUMMARIZE THE COMPANY'S CBA RESULTS**

2 A. Schedule DED-1 summarizes the Company's CBA results on an individual measure and
3 total portfolio basis. All of the Company's proposed core programs are cost-effective under the
4 NJCT, i.e., have benefit-cost ratios greater than one. However, only three of the six utility-led
5 programs are cost-effective under the NJCT. Overall, the Company found that its proposed
6 portfolio of efficiency programs has a benefit-cost ratio of 2.0 using the NJCT. Except for the
7 SCT, at least one program fails each CSPM test.

8 **Q. DO ANY OF THE COMPANY'S COST-EFFECTIVENESS TESTS ISOLATE**
9 **HOW THESE PROGRAMS IMPACT RATEPAYERS?**

10 A Yes. As I noted earlier, the RIM test examines the impact that the SAVEGREEN
11 program and its individual measures have on ratepayers. A benefit-cost ratio greater than one for
12 the RIM test indicates that program energy savings benefits outweigh the rate impacts imposed
13 on non-participating customers. Schedule DED-1, which summarizes the individual cost
14 effectiveness test results for each SAVEGREEN program, includes a column summarizing the
15 Company's RIM results. The column shows that three out of the five core programs fail the RIM
16 test, whereas all six of the utility-led programs fail RIM. Overall, the Company estimates that
17 the SAVEGREEN portfolio passes the RIM test; however, these results are questionable and the
18 programs' performance could actually be worse since many of the data series, inputs, and/or
19 calculations used by the Company in the construction of its various CBAs, including the RIM
20 test, are faulty. I will discuss these deficiencies in more detail in a later section of my testimony.

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1 **IV. CBA REQUIRED UNDER THE CEA**

2 **Q. WHAT ANALYSIS OF COSTS AND BENEFITS IS CALLED FOR UNDER THE**
3 **CEA?**

4 **A.** The CEA requires the Board to adopt energy efficiency and peak demand reduction
5 programs “to ensure investment in cost-effective energy efficiency measures, ensure universal
6 access to energy efficiency measures, and serve the needs of low-income communities.”²⁶ The
7 CEA also specifically requires that the cost-effectiveness of energy programs be evaluated using
8 a benefit-to-cost ratio (“BCR”). The CEA requires that each portfolio have a benefit-to-cost-ratio
9 of at least one in order to assure cost-effectiveness. Individual programs may have a benefit-to-
10 cost-ratio less than one, but only “if implementation of the program is in the public interest,
11 including, but not limited to, benefitting low-income customers or promoting emerging energy
12 efficiency technologies.”²⁷

13 **Q. HAS THE BOARD SELECTED AN INDIVIDUAL COST-EFFECTIVENESS**
14 **TEST AS A “SCREEN” FOR UTILITY EFFICIENCY PROGRAM PROPOSALS?**

15 **A.** Yes. As noted earlier, the Board will use the NJCT as the primary screening test, or
16 CBA, for evaluating individual measures and an overall utility program (or portfolio). This CBA
17 was adopted in order to assure that the Board’s program evaluation was consistent with the
18 CEA’s requirements and to “carefully steward ratepayer dollars, confirm that the efficiency
19 investments are cost-effective, and ensure that the programs are universally accessible and serve
20 the needs of low-income communities throughout the state.”²⁸

²⁶ N.J.S.A. 48:3-87(g).

²⁷ N.J.S.A. 48:3-87.9(d)(2).

²⁸ NJ Cost Test Order, Appendix A, at 2.2.

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1 **Q. DOES THE BOARD REQUIRE THE USE OF ANY OTHER COST-**
2 **EFFECTIVENESS TESTS?**

3 A. Yes, the Board requires that utilities report the results of five cost-effectiveness tests New
4 Jersey has historically used to review the costs and benefits of energy efficiency programs.²⁹ As
5 discussed earlier, these cost effectiveness tests were originally developed in the CSPM and have
6 been widely adopted since the early 1980s.

7 **Q. WHY DOES THE BOARD REQUIRE THAT THESE FIVE ADDITIONAL**
8 **TESTS BE EVALUATED AND REPORTED DURING THE FIRST PROGRAM**
9 **CYCLE?**

10 A. The Board has stated that these tests be reported for informational purposes. In
11 comments appended to the NJCT Order Staff explained that these five tests “continue to offer
12 important insights on program design”³⁰ and allow “for rate impacts to be monitored by
13 evaluating programs using the RIM.”³¹ Staff also recommended that “information on program
14 design provided by the RIM and how the NJCT addresses ratepayer impacts should be evaluated
15 by the Evaluation, Measurement, and Verification (“EM&V”) Working Group during the
16 triennial review.”³²

17 **Q. FOR PROGRAMS WITH A BENEFIT-TO-COST RATIO OF LESS THAN 1.0,**
18 **HOW WILL THE BOARD DETERMINE WHETHER A PARTICULAR PROGRAM**
19 **SHOULD BE ADOPTED BECAUSE IT IS IN THE PUBLIC INTEREST?**

²⁹ NJ Cost Test Order, Appendix A, pp. 6-9.

³⁰ NJ Cost Test Order, Appendix B, p. 16.

³¹ NJ Cost Test Order, Appendix B, p. 18.

³² NJ Cost Test Order, Appendix B, p. 18.

PUBLIC

1 A. The Board has interpreted the public interest exception as applying to programs being
2 adopted “for good reason, such as to promote health and safety, to ensure equitable access, or to
3 spur innovation, the adoption of other measures, or longer-term market transformation.”³³

4 **Q. DO YOU HAVE ANY CONCERNS WITH THIS INTERPRETATION?**

5 A. Yes. Staff’s interpretation would allow for the approval of a wide range of non-cost-
6 effective measures not closely tied to the stated purpose of the CEA. As the Board has noted,
7 under the CEA, the Board is charged with ensuring investment in cost-effective energy
8 efficiency measures “while also ensuring ‘universal access to energy efficiency measures, and
9 serving ‘the needs of low-income communities.’”³⁴ I therefore recommend that the public
10 interest exemption for programs with a benefit-to-cost-ratio of less than one should be limited to
11 programs that are intended to: promote investments in (other) cost-effective energy investment
12 measures; ensure universal access to energy efficiency measures; or serve the needs of low-
13 income communities. For example, energy audit programs are intended to generate referrals to
14 other (cost-effective) energy efficiency programs, while programs targeting market segments that
15 have typically been underserved by past energy efficiency programs help to ensure universal
16 access,³⁵ and programs for which participants must meet some income-based requirement (e.g.,
17 being below some multiple of the federal poverty line) serve the needs of low-income
18 communities.

19

³³ NJ Cost Test Order, Appendix A, p. 2.

³⁴ NJ Cost Test Order, Appendix A, p. 2.

³⁵ For example, the Energy Solutions for Business-Engineered Solutions subprogram will provide tailored energy efficiency projects to public service entities, such as municipalities, universities, schools, hospitals and healthcare facilities, (“MUSH”), and non-profit entities, participants in market segments that have typically been underserved will be able to achieve greater energy savings. Petition Exhibit P-5, p. 64.

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1 **V. THE COMPANY’S NJCT RESULTS ARE OVERSTATED**

2 **Q. DOES THE NJCT ANALYSIS SUBMITTED BY THE COMPANY COMPLY**
3 **WITH THE BOARD’S NJ COST TEST ORDER?**

4 A. No. The Company’s NJCT results are based upon a series of problematic data, incorrect
5 assumptions, and methodological errors including the use of escalated or inflated prices; the
6 application of a real discount rate to nominal forecasts of costs and benefits; the inclusion of NJ
7 Sales and Use Tax (“SUT”) in the costs and benefits; and the use of avoided wholesale gas costs
8 based on forecast prices for TETCO M3 instead of Henry Hub.

9 **Q. PLEASE DISCUSS THE USE OF ESCALATED OR INFLATED PRICES.**

10 A. The Company’s NJCT utilizes avoided wholesale electricity energy costs and ancillary
11 services costs that are calculated using escalated prices instead of the Board-required three-year
12 rolling average of historic prices.³⁶ Furthermore, the NJCT does not generally call for the use of
13 price escalators because the NJCT specifies that a real discount be used, and real discount rates
14 should be applied to the real values of costs and benefits, instead of nominal escalated values.

15 **Q. PLEASE DISCUSS THE COMPANY’S APPLICATION OF A REAL DISCOUNT**
16 **RATE TO NOMINAL FORECASTS.**

17 A. In its NJ Cost Test Order, the Board specified that “the interim NJCT will use a 3.0
18 percent real discount rate.”³⁷ A fundamental principle of the economics of price levels is that
19 real discount rates should be applied to real costs/benefits while nominal discount rates should be
20 applied to nominal costs/benefits. The CBA submitted by the Company takes the 3.0 percent
21 real discount rate specified in NJCT Order and treats it as a nominal rate by applying it to the

³⁶ NJ Cost Test Order at 6.

³⁷ NJ Cost Test Order, Appendix A, p. 10.

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1 forecasted nominal costs/benefits.³⁸ The Company has indicated that an inflation rate of
2 approximately 2.3 percent was used in its analysis.³⁹ The nominal interest rate is equal to the real
3 interest rate plus the rate of inflation, so in this case, a real discount rate of 3.0 percent is
4 equivalent to a nominal rate of 5.3 percent. Because the costs of EE programs are incurred
5 before the benefits are realized, using a discount rate that is too low will cause the present
6 discounted value of the benefits to be overstated relative to the present discounted value of the
7 costs and the benefit-to-cost ratio to be overstated.⁴⁰

8 **Q. PLEASE DISCUSS NEW JERSEY SUT.**

9 A. Appendix B of the Board's NJ Cost Test Order notes that avoided New Jersey SUT
10 should not be included in the calculation of avoided costs under the NJCT.⁴¹ This reflects the
11 fact that New Jersey SUT is collected by the State of New Jersey which uses the collected funds
12 to further the public interest of the citizens of New Jersey. Therefore, any benefit that utilities or
13 ratepayers may experience as a result of avoided SUT is offset by the State's loss of SUT
14 revenue. The impact of correcting the Company's CBA to exclude SUT on the benefit-to-cost-
15 ratios depends on the shares of benefits and costs under the NJCT subject to SUT. The principal
16 source of benefits is due to a reduction in energy costs subject to SUT, some categories of
17 benefits are not subject to SUT, such as Avoided CO₂ Emissions and Low-Income Benefits.

³⁸ Company Responses to RCR-NJNG-ECON-2, RCR-NJNG-ECON-4, RCR-NJNG-ECON-5, RCR-NJNG-ECON-8.

³⁹ Company Response to RCR-NJNG-ECON-12.

⁴⁰ See, also, Company Response to RCR-NJNG-ECON-12 indicating that portfolio-level BCR would decline from 2.0 to 1.7 if a discount rate of 5.3 percent were used in place of the 3.0 rate used in the Company's CBA.

⁴¹ See, NJ Cost Test Order, Appendix B, p. 9: "SUMMARY: PSE&G commented that the NJCT Proposal omitted New Jersey sales tax costs and suggested that it should be included because customers will avoid taxes as they use less energy. STAFF RESPONSE: Staff appreciates PSE&G's suggestion to include avoided New Jersey sales tax as part of the avoided costs included in the NJCT. The EM&V Working Group should review this topic as it undertakes its review of the NJCT's avoided costs during the triennial review period."

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1 Because some program costs will also be partially exempt from SUT, the net impact of SUT on
2 the benefit-to-cost ratios is relatively minor.⁴²

3 **Q. PLEASE DISCUSS THE WHOLESALE NATURAL GAS PRICES USED IN THE**
4 **COMPANY'S NJCT.**

5 A. The Board's NJCT rule defines avoided wholesale natural gas costs as those using New
6 York Mercantile Exchange ("NYMEX") forward trading prices for Henry Hub multiplied by the
7 quantity of gas not purchased. The rule also indicates that utilities may include actual natural gas
8 transportation rates and any local distribution company transportation rates.⁴³ However, instead
9 of using the Henry Hub forward trading prices plus the Company's actual natural gas
10 transportation rates, the Company's CBA (NJCT) uses a natural gas price forecast in which "the
11 underlying Henry Hub supply forecast was combined with the Tetco M3 basis to determine the
12 avoided cost projection."⁴⁴ In regional U.S. natural gas markets, price indexes are often
13 calculated in "basis prices" which is defined as the difference between the value of the regional
14 price index and the Henry Hub price, so the Tetco M3 basis is equal to the difference between
15 the Tetco M3 index price and the Henry Hub price. Thus, the Company's CBA effectively used
16 Tetco M3 prices instead of Henry Hub prices.

17 **Q. DID THE COMPANY EXPLAIN WHY IT ADOPTED THIS METHOD FOR**
18 **DETERMINING WHOLESALE NATURAL GAS PRICES?**

19 A. Yes. The Company explained that it used the Tetco M3 price because it was trying to
20 forecast "the market price for natural gas supply to NJNG's citygate."⁴⁵ Thus, the CBA

⁴² The impact of SUT is excluded by changing the value of cell D48 in sheet "Portfolio Assumptions" of CONFIDENTIAL WP - BJB-3.1 - NJNG EE Program Model.xlsx from 6.625 percent to 0 percent.

⁴³ NJ Cost Test Order at 13.

⁴⁴ Baatz Direct Testimony, 10:10-11:2.

⁴⁵ Company Response to RCR-NJNG-ECON-3.

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1 effectively assumes that the Company purchases natural gas principally at the citygate in the spot
2 market. However, the Company actually purchases most natural gas at other locations and then
3 transports it to the citygate by contracting for transportation and storage with pipelines.⁴⁶ As
4 shown in CONFIDENTIAL Schedule DED-4, [BEGIN CONFIDENTIAL] [REDACTED]

5 [REDACTED]
6 [REDACTED] [END

7 CONFIDENTIAL]⁴⁷ This assumption is contrary to both recent market conditions and
8 expectations for the near future, as northeastern gas prices are expected to remain depressed as a
9 result of continued shale gas production while Gulf Coast prices will be supported by increasing
10 demand from LNG export terminals.⁴⁸

11 **Q. WHAT IMPACT DO THESE INCONSISTENCIES HAVE ON THE BENEFIT-**
12 **TO-COST RATIOS REPORTED BY THE COMPANY?**

13 A. This will lead to overstated benefit-cost-ratios relative to the benefit cost ratios that
14 would have resulted from an analysis that was consistent with the NJCT Order.

15 **Q. HAVE YOU DEVELOPED ANY ALTERNATIVE ESTIMATES CORRECTING**
16 **FOR SOME OF THE COMPANY'S DEFICIENCIES?**

17 A. Yes. Schedule DED-5 provides alternative NJCT estimates for the Company's proposed
18 measures. These alternative estimates are developed using a real discount rate, using Henry Hub
19 futures prices as a more appropriate wholesale natural gas price forecast, and removing the SUT
20 specified in the NJCT Order. It is important to note that the resulting BCRs are only partially

⁴⁶ I/M/O The Petition of New Jersey Natural Gas Company (NJNG) for the Annual Review and Revision of its Basic Gas Supply Service (BGSS) and Conservation Incentive Program (CIP) Rates for F/Y 2021, Pre-Filed Direct Testimony of Jayana S. Shah, 6:7 – 10:15, JSS-5. Available at: https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2109210.

⁴⁷ See CONFIDENTIAL Schedule DED-4.

⁴⁸ See, e.g., <https://www.eia.gov/outlooks/aeo/pdf/AEO2020%20Natural%20Gas.pdf>.

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1 corrected since the Company's CBA still contains additional errors and inconsistencies which I
2 discuss later. The table in the exhibit shows that the Company's overall portfolio BCR falls from
3 2.0 to 1.6. In addition, there are two utility-led programs, Engineered Solutions and Hybrid
4 Heat, and one core program, Home Performance with ENERGY STAR ("HPwES") where the
5 BCR falls below 1.0 as a result of correcting these inconsistencies.

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1 **VI. THE COMPANY'S CBAS ARE UNRELIABLE**

2 **Q. DOES THE COMPANY'S CBA CONTAIN ANY OTHER ERRORS OR**
3 **INCONSISTENCIES?**

4 A. Yes, the Company's CBAs contain several other errors or inconsistencies related to its:
5 proposed avoided capacity cost benefits; proposed benefits from Demand Reduction Induced
6 Price Effects ("DRIPE"); proposed benefits due to reduced exposure to volatility; and proposed
7 environmental benefits. Each of these errors and inconsistencies results in an overstatement of
8 benefits and benefit-to-cost-ratios.

9 **a. PROPOSED AVOIDED CAPACITY COST BENEFITS**

10 **Q. DOES THE COMPANY'S CBA INCLUDE BENEFITS ASSOCIATED WITH AVOIDED**
11 **WHOLESALE ELECTRIC CAPACITY?**

12 A. Yes. Several cost-effectiveness tests (or CBAs) included in the Company's filing include
13 the use of avoided wholesale electric capacity costs benefits including the NJCT, SCT, TRC,
14 PAC and RIM tests. This benefit is utilized to capture the wholesale reduction in PJM capacity
15 requirements resulting from reductions in electric demand created by the Company's proposed
16 efficiency programs.⁴⁹

17 **Q. HOW DOES THE COMPANY CALCULATE AVOIDED WHOLESALE**
18 **ELECTRIC CAPACITY?**

19 A. The Company first obtained actual cleared PJM Eastern Mid-Atlantic Area Council
20 ("EMAAC") Locational Deliverability Area ("LDA") prices, and then forecast EMAAC prices
21 based upon a baseline of the average clearing price for the previous three delivery years.⁵⁰ Prices

⁴⁹ Baatz Direct Testimony, 12:5-7.

⁵⁰ Id. at 12:7-10.

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1 were then escalated based upon a regression forecast of capacity price increases over time.⁵¹
2 Finally, these values were adjusted to account for marginal line losses on Jersey Central Power &
3 Light (“JCP&L”) and PJM’s system, PJM’s Forecasted Pool Requirement (“FPR”) to account
4 for avoided reserve requirements, and sales and use tax.⁵²

5 **Q. DOES THE BOARD’S NJCT ADDRESS AVOIDED WHOLESALE ELECTRIC**
6 **CAPACITY COSTS?**

7 A. Yes. The Board’s NJCT Order indicates that avoided wholesale electric capacity costs
8 should be calculated as either the revenues earned from offering and clearing EE into the PJM
9 capacity market, or the direct savings equal to the difference in capacity costs pre-EE to the
10 capacity costs after EE improvements are made.⁵³ While the Board’s NJCT Order does not
11 provide specific guidance on the capacity prices used in calculating the benefits of avoided
12 capacity costs, it does specify that electric capacity DRIPE benefits be calculated using PJM
13 capacity prices for the Mid-Atlantic Area Council (“MAAC”) capacity zone.⁵⁴ MAAC capacity
14 prices have been lower than EMAAC prices in the three most recent PJM auctions. Therefore,
15 the Company’s use of EMAAC prices in the calculation of benefits from avoided capacity costs
16 will result in benefit-to-cost-ratios that are overstated relative to the ratios that would be
17 calculated using MAAC capacity prices.⁵⁵ In addition, and as mentioned above, the NJCT also
18 calls for the use of a real discount rate and real, uninflated prices: corrections which also need to
19 be incorporated into the avoided wholesale capacity cost estimates.

⁵¹ Id. at 12:10-11.

⁵² Id. at 12:10-13.

⁵³ NJ Cost Test Order at 4.

⁵⁴ NJ Cost Test Order, Appendix A, p. 16.

⁵⁵ 2021/2022 Base Residual Auction Results, PJM, p.16. Available at: <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2021-2022/2021-2022-base-residual-auction-report.ashx?la=en>.

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1 **Q. HAVE PRIOR DOCUMENTS RELIED UPON BY THE BOARD PROVIDED**
2 **GUIDANCE ON APPROPRIATE METHODS TO FORECAST WHOLESALE**
3 **ELECTRIC CAPACITY PRICES?**

4 A. Yes. On March 13, 2018, the Rutgers Center for Energy, Economic, and Environmental
5 Policy (“CEEEP”) published a memorandum laying out a set of assumptions to administrators of
6 the New Jersey Clean Energy Program for use in performing CBAs. The CEEEP analysis uses
7 New Jersey Utility PJM RPM prices for the four electric utilities for 2010 through 2019 and
8 weighted them by each utility’s historic peak load to derive an average New Jersey capacity
9 price.⁵⁶ To project prices through 2038, CEEEP used the projected annual change in U.S. GDP
10 Price Index as reported by the EIA. The CEEEP memorandum recommended that avoided
11 wholesale electric capacity prices be based on the results of RPM, escalating these prices into the
12 future based on EIA’s projected annual change in U.S. GDP. This approach notably differs from
13 that used by the Company. It should also be noted that the recommended nominal avoided
14 wholesale capacity prices estimated by CEEEP in early 2018, are often nearly half the forecasted
15 nominal prices utilized by the Company.

16 **Q. WHAT IS YOUR RECOMMENDATION FOR THE ESTIMATION OF**
17 **AVOIDED WHOLESALE ELECTRIC CAPACITY COSTS?**

18 A. I recommend the Board utilize either utilize the values included in the earlier-referenced
19 CEEEP analysis, or update this previous analysis using an identical approach for recent changes
20 in regional electric capacity markets.

21 **b. PROPOSED DRIPE BENEFITS**

⁵⁶ Center for Energy, Economic & Environmental Policy. 2018. Energy Efficiency Cost-Benefit Analysis Avoided
Cost Assumptions. March 13, 2018. Page 4. Available at:
[http://www.njcleanenergy.com/files/file/Library/Market%20Research/Avoided%20Cost%20Memo%20\(3-13-18\).pdf](http://www.njcleanenergy.com/files/file/Library/Market%20Research/Avoided%20Cost%20Memo%20(3-13-18).pdf).

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1 **Q. DOES THE COMPANY INCLUDE OTHER WHOLESALE MARKET BENEFITS IN ITS**
2 **CBA?**

3 A. Yes. The Company includes both natural gas and electric DRIPE related benefits based
4 upon the assumption that a reduction in electric and natural gas demand will lead to a
5 corresponding reduction in wholesale market prices.⁵⁷

6 **Q. HOW DOES THE COMPANY CALCULATE DRIPE BENEFITS?**

7 A. The Company estimated three different DRIPE benefits in its analysis. For electric
8 energy DRIPE, the Company examined historic average monthly wholesale energy prices and
9 monthly delivered electric energy, establishing a simple linear relationship between the two. For
10 electric capacity, the Company examined the difference between baseline capacity auction
11 results pertaining to EMAAC and the results of a PJM analysis of a scenario in which 3,000 MW
12 of low-cost supply are removed from the MAAC. Lastly, for natural gas DRIPE the Company
13 examined historic average daily pipeline natural gas rates and associated delivered volumes for
14 the period January 2, 2019 to July 21, 2020. Electric energy and capacity DRIPE are included in
15 the Company's NJCT, SCT, TRC, PAC and RIM, while natural gas DRIPE is included in the
16 Company's SCT and PAC.⁵⁸

17 **Q. DOES THE BOARD'S NJCT DISCUSS THE INCLUSION OF ELECTRIC**
18 **ENERGY DRIPE BENEFITS?**

19 A. Yes. The Board's NJCT Order states that electric energy DRIPE should be calculated
20 using a linear regression of historic electric energy prices as a function of load in order to

⁵⁷ Baatz Direct Testimony, 12:15 to 13:4.

⁵⁸ In particular, the Company's PAC CBA includes Natural Gas DRIPE in line 20, Electric Energy and Capacity Demand Reduction Induced Price Effects (DRIPE), while the Company's SCT CBA has a separate line item for Natural Gas DRIPE.

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1 estimate the impact of reduced load from energy efficiency on electric energy prices.⁵⁹ The
2 NJCT Order, however, does not specify whether monthly, daily or hourly load and prices should
3 be used in the regression. However, given that wholesale electric energy prices in PJM are set
4 on an hourly basis and reflect load during that hour, an hourly regression would best capture the
5 underlying price dynamic.⁶⁰ Even if one were to run this regression using monthly data, average
6 load data should be used instead of cumulative load data since cumulative load is higher in
7 longer months and the price of electricity is not impacted by the number of days in a month.⁶¹

8 **Q. DOES THE BOARD'S NJ COST TEST ORDER DISCUSS ELECTRIC**
9 **CAPACITY DRIPE BENEFITS?**

10 A. Yes. The NJ Cost Test Order states that electric capacity DRIPE benefits be calculated
11 using a linear extrapolation of price differentials between the actual auction results and the
12 results of a scenario in which PJM removes 3,000 MW of capacity performance supply from the
13 bottom of the supply curve in the MAAC capacity zone. The Order provides the example that
14 1,000 MW of DRIPE eligible EE would be credited with a price impact equal to one-third of the
15 3,000 MW figure developed by PJM.⁶²

16 **Q. IS THE COMPANY'S ANALYSIS OF THE BENEFITS OF ELECTRIC**
17 **CAPACITY DRIPE CONSISTENT WITH THE BOARD'S INSTRUCTIONS?**

18 A. No, the Board has ordered that electric capacity DRIPE benefits be calculated by
19 analyzing prices in the MAAC zone. In contrast, the Company's CBA relies on an extrapolation
20 of actual prices in EMAAC, and a scenario in which the Company assumed [BEGIN

⁵⁹ NJ Cost Test Order, Appendix A, p. 15.

⁶⁰ In particular, PJM locational marginal prices are calculated on an hourly basis in the day-ahead market. See <https://www.pjm.com/~media/about-pjm/newsroom/fact-sheets/locational-marginal-pricing-fact-sheet.ashx>, p. 2.

⁶¹ Company Response to RCR-NJNG-ECON-6.

⁶² NJ Cost Test Order, Appendix A, p.16.

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1 **Q. DOES THE BOARD'S NJCT ORDER DISCUSS NATURAL GAS DRIPE**
2 **BENEFITS?**

3 A. Yes, the Board noted that additional DRIPE benefits, including natural gas DRIPE would
4 be considered for inclusion in the updated NJCT used in the second triennial period.⁶⁴ Staff
5 further explained that the EM&V Working Group will review whether natural gas DRIPE should
6 be one of the energy benefits included in the NJCT.⁶⁵

7 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THE INCLUSION OF**
8 **NATURAL GAS DRIPE BENEFITS?**

9 A. I recommend that the Board reject the Company's proposed natural gas DRIPE benefits
10 since it is highly unlikely the any natural gas demand reductions resulting from the Company's
11 programs will in any way impact natural gas markets or prices, particularly given NJNG's
12 overall size and the size of the benefits included in its filing.

13 **c. PROPOSED VOLATILITY BENEFITS**

14 **Q. DOES THE COMPANY ARGUE THAT THERE WILL BE BENEFITS**
15 **ASSOCIATED REDUCED EXPOSURE TO WHOLESALE MARKET PURCHASES?**

16 A. Yes. The Company claims that wholesale electric and natural gas prices are inherently
17 risky and subject to large fluctuations in price.⁶⁶ The Company goes on to argue that energy
18 efficiency measures and related practices which reduce the amount of overall energy purchased
19 by customers provide additional benefits by reducing customer exposure to these volatile

⁶⁴ NJ Cost Test Order, Appendix A, p. 15.

⁶⁵ NJ Cost Test Order, Appendix B, p. 8.

⁶⁶ Baatz Direct Testimony, 13:17-19.

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1 markets.⁶⁷ Benefits from reduced exposure to volatile wholesale costs is not included in the
2 NJCT.⁶⁸

3 **Q. HOW DOES THE COMPANY CALCULATE ITS PURPORTED VOLATILITY**
4 **BENEFIT?**

5 A. The Company states that the risk avoidance benefit can be calculated as a price adder to
6 the cost of electricity and natural gas within its SCT, PAC and RIM tests.⁶⁹ To determine this
7 adder, the Company reviewed past studies and regulatory decisions that included such an adder
8 and concluded from this survey that a ten percent premium is a “conservative” estimate.⁷⁰

9 **Q. WHAT IS THE TOTAL MONETARY BENEFIT ASSOCIATED WITH THE**
10 **CLAIMED VOLATILITY BENEFIT?**

11 A. The Company claims that the energy efficiency proposals will provide [BEGIN
12 CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL] in volatility benefits over a 32-year
13 period on an NPV basis.⁷¹

14 **Q. WHAT ARE SOME OF THE ANALYTIC PROBLEMS ASSOCIATED WITH**
15 **THE COMPANY’S VOLATILITY BENEFIT ESTIMATE?**

16 A. The primary analytical problem with the Company’s volatility benefits is that they are not
17 directly estimated based upon the specifics of the Company’s energy efficiency proposals, but
18 instead, are based upon a survey of other studies that have very limited applicability to the
19 instant proceeding. Schedule DED-7 summarizes the results from the studies surveyed by the

⁶⁷ Id. at 10:1, 13:21 to 14:4.

⁶⁸ See, NJCT Order, Appendix B, p. 9: “SUMMARY: Gabel Associates, ETG/SJG, and PSE&G recommended that avoided wholesale volatility costs be included in the NJCT through a 10% adder for energy and capacity benefits. STAFF RESPONSE: Staff thanks stakeholders for the comments and recommendations. The inclusion of avoided wholesale volatility costs will be evaluated during the triennial review, as the EM&V WG further reviews the avoided costs in the NJCT.”

⁶⁹ Baatz Direct Testimony, 14:5-7.

⁷⁰ Id. at 14:7-9.

⁷¹ Baatz Direct Testimony, CONFIDENTIAL Workpaper BJB-3.1.

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1 Company in for its analysis. This table shows that there are a wide range of estimates from each
2 study, ranging from a 7.5 percent benefit on the low end, to a 24 percent benefit on the high end.

3 **Q. WHY DO THESE RESULTS ESTIMATING VOLATILITY BENEFITS VARY?**

4 A. Benefits associated with fixed price hedges are dependent on the specific regional energy
5 markets in question and the market conditions prevailing at the time in which the study was
6 conducted. Unlike most other states, energy supply for retail electric customers in New Jersey
7 purchasing electricity from their utility is procured in the annual Basic Generation Service
8 (“BGS”) auctions conducted each February. As the Board has noted, the staggered, three-year
9 rolling procurement process used in the BGS auctions provides a hedge to customers reducing
10 the impact of wholesale electric price volatility on New Jersey’s consumers.⁷² From a regional
11 power market perspective, several studies included in the Company’s analysis are well outside
12 of, and unrelated to, the market conditions in New Jersey or the mid-Atlantic region. Some of
13 these studies, for instance, were conducted for such geographic markets as Mississippi, Oregon,
14 and Ohio.

15 **Q. HOW CAN THE TIMING OF STUDIES IMPACT THE ESTIMATION OF**
16 **VOLATILITY BENEFITS?**

17 A. The timing of such studies can heavily influence the estimation of associated volatility
18 hedge benefits. Consider that the majority of the studies reviewed by the Company were
19 published between 2013 and 2014. However, from March 2012 until March 2014, there was
20 significant movement (volatility) in Henry Hub natural gas spot prices.⁷³ Natural gas prices
21 increased from \$2.06 per MMBtu on March 30, 2012 to \$6.55 per MMBtu on February 14, 2014,

⁷² I/M/O The Provision of Basic Generation Service (BGS) for the Period Beginning June 1, 2019, BPU Dkt. No. ER18040356, Order at 18 (Nov. 13, 2019).

⁷³ U.S. Energy Information Administration, Henry Hub Natural Gas Spot. Available at: <https://www.eia.gov/dnav/ng/hist/rngwhhdW.htm>.

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1 before decreasing in 2015 to below \$4.00 per MMBtu, where prices remained until 2018.⁷⁴
2 Also, there was a major spike in New Jersey electricity prices on January 14, 2014, where for a
3 few hours, the price spiked to over \$1,800 per MWh.⁷⁵ Another study used by the Company in
4 its analysis includes the 2000-2001 natural gas price spike in the period analyzed.⁷⁶

5 **Q. WHAT OTHER FACTORS CAN INFLUENCE THE ESTIMATION OF** 6 **VOLATILITY BENEFITS?**

7 A. Volatility benefits are also dependent on the resource being examined since the cost of
8 the given resource determines its “fixed price” level and the magnitude of its hedging ability
9 (i.e., its ability to offset peak and needle peak prices in any given market). In particular, the
10 volatility benefits attributable to energy efficiency are expected to be lower than the benefits of
11 low-fuel-cost generation because energy efficiency is a passive resource and the level of energy
12 efficiency savings cannot be adjusted in response to changes in energy prices. Schedule DED-7
13 shows that the resources reviewed in the studies relied upon by the Company vary tremendously.
14 Some of the studies listed assess the benefit of fixed contracts as they relate to natural gas-fired
15 electric generating units. Others refer primarily to small-scale solar facilities participating in net
16 metering programs, or to wind generation facilities.⁷⁷ Only one study in question examines the
17 volatility benefits associated with energy efficiency programs.⁷⁸

⁷⁴ Id.

⁷⁵ Baatz, Barrett, Stickles, Estimating the Value of Energy Efficiency to Reduce Wholesale Energy Price Volatility, April 2018, Page 10.

⁷⁶ Bolinger et al, Quantifying the Value that Energy Efficiency and Renewable Energy Provide as a Hedge Against Volatile Natural Gas Prices. Lawrence Berkley National Labs.

⁷⁷ See, Hornby, Rick, et. al. (July 12, 2013); Avoided Energy Supply Costs in New England: 2013 Report; Avoided-Energy-Supply-Component (AESC) Study Group; and 2013 Integrated Resource Plan (April 30, 2013), PacificCorp.

⁷⁸ See, Baatz, Brendon, et. al. (April 2018); Estimating the Value of Energy Efficiency to Reduce Wholesale Energy Price Volatility; American Council for an Energy-Efficient Economy (“ACEEE”), Report U1803.

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1 **Q. WHAT DO YOU RECOMMEND REGARDING THE INCLUSION OF**
2 **WHOLESALE MARKET VOLATILITY BENEFITS?**

3 A. I recommend that the Board reject the inclusion of any such benefits. These benefits are
4 speculative, and the Company has not provided sufficient evidence to support their legitimate
5 inclusion. Such benefits can only be supported by analyses of current market conditions and not
6 references to estimates relied upon elsewhere in the country during distinctive market conditions
7 relative to current wholesale market conditions.

8 **d. PROPOSED ENVIRONMENTAL BENEFITS**

9 **Q. WHAT ENVIRONMENTAL BENEFITS DOES THE COMPANY IDENTIFY IN**
10 **ITS CBAS?**

11 A. The Company notes that traditional electric power generation emits environmental
12 pollutants such as carbon dioxide (“CO₂”), nitrous oxides (“NO_x”), and sulfur dioxide (“SO₂”).
13 Energy efficiency programs displace the need for generation through traditional power plants,
14 providing benefits to New Jersey ratepayers through the avoidance of these emissions, and the
15 associated health and environmental harms.⁷⁹ The Company’s NJCT only takes into account the
16 environmental benefits from CO₂ emissions reductions, while the Company’s SCT takes into
17 account the environmental benefits of CO₂, NO_x and SO₂ emissions.⁸⁰

18 **Q. HOW DID THE COMPANY ESTIMATE AVOIDED EMISSIONS ASSOCIATED**
19 **WITH ITS PROPOSAL?**

20 A. To estimate avoided CO₂ emissions, the Company used set emissions factors of 1,374
21 pounds per avoided MWh of electrical use, and 11.7 pounds per avoided therm of natural gas

⁷⁹ Baatz Direct Testimony, 16:15-18.

⁸⁰ Baatz Direct Testimony, 10:1.

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1 use.⁸¹ These factors are consistent with those outlined in the Board’s NJ Cost Test Order.⁸²
2 Avoided NO_x and SO₂ emissions calculated based on the non-baseload tons per MWh estimate
3 from the EPA’s Emissions & Generation Resource Integrated Database for 2018
4 (“eGRID2018”).⁸³

5 **Q. HOW DOES THE COMPANY CALCULATE MONETARY BENEFITS**
6 **ASSOCIATED WITH AVOIDED ENVIRONMENTAL EMISSIONS?**

7 A. The Company uses two approaches to calculate the monetary benefits associated with
8 avoided environmental emissions. For avoided CO₂ emissions, the Company relies on estimated
9 damages from the August 2016 Technical Update of the Social Cost of Carbon for Regulatory
10 Impact Analysis – Under Executive Order 12866 (“2016 Technical Update”) published by the
11 Federal Government.⁸⁴ For avoided NO_x and SO₂ emissions, the Company relied on the
12 February 2018 Technical Support Document Estimating the Benefit per Ton of Reducing PM_{2.5}
13 Precursors from 17 Sectors by the U.S. Environmental Protection Agency Office of Air and
14 Radiation Office of Air Quality Planning and Standards (“2018 Technical Support Document”).⁸⁵

15 **Q. HAVE YOU REVIEWED THE 2016 TECHNICAL UPDATE?**

16 A. Yes. The 2016 Technical Update was the published results of an Interagency Working
17 Group made up of many Federal Executive Agencies to establish a set social cost of carbon to
18 allow the executive agencies to include social benefits of reducing CO₂ emissions within
19 regulatory impacts analyses (“RIA”).⁸⁶ The RIA approach is motivated by Executive Order

⁸¹ Id. at 16:19-21.

⁸² NJ Cost Test Order, Appendix A, p. 17.

⁸³ Baatz Direct Testimony, 17:4-10.

⁸⁴ Id. at 16:21 to 17:2.

⁸⁵ Id. at 17:10-14.

⁸⁶ Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866 (August 2016); Interagency Working Group on Social Cost of Greenhouse Gases.

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1 12866, signed by President Clinton in September 1993.⁸⁷ The executive order holds that all
2 Federal agencies must assess the cost and benefits of all actions, and that the benefits of any
3 proposed action outweigh the estimated costs.⁸⁸ The Board has ordered that under the NJCT the
4 value of avoided CO₂ emissions should be included within NJCT estimates consistent with the
5 finding of the 2016 Technical Update's social cost of carbon valued at a three percent discount
6 rate.⁸⁹

7 **Q. HAVE YOU REVIEWED THE 2018 TECHNICAL SUPPORT DOCUMENT?**

8 A. Yes. The 2018 Technical Support Document is an EPA update to its prior 2013
9 Technical Support Document describing an approach for estimating the average avoided human
10 health impacts related to fine particulate matter ("PM_{2.5}") and PM_{2.5} precursors including NO_x
11 and SO₂ from 17 sectors.⁹⁰ Importantly, the EPA's analysis does not estimate the economic costs
12 associated with NO_x and SO₂ emissions, but estimates the economic costs associated with
13 negative human health effects of PM_{2.5} accumulation in the atmosphere that is either directly
14 emitted or formed in the atmosphere as a result of NO_x and SO₂ emissions.

15 **Q. HOW DID THE EPA ESTIMATE THE HUMAN HEALTH BENEFITS OF THE**
16 **PROPOSED AVOIDED ENVIRONMENTAL EMISSIONS?**

17 A. The EPA constructed a damage function for each pollutant based on evidence included in
18 Integrated Science Assessments. Schedule DED-6 shows the individual effects that were
19 assessed in calculating the monetary impact of fine particulate emissions. As can be seen, the

⁸⁷ Executive Order 12866 (September 30, 1993).

⁸⁸ Executive Order 12866 (September 30, 1993).

⁸⁹ NJ Cost Test Order, Appendix A, p. 17.

⁹⁰ Technical Support Document: Estimating the Benefits per Ton of Reducing PM_{2.5} Precursors from 17 Sectors (February 2018); U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards.

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1 range of negative effects assessed by the EPA ranged from premature mortality and school
2 absences, to acute bronchitis and lost workdays: all of which are long-term and speculative.

3 **Q. DID THE BOARD PROVIDE GUIDANCE ON THE INCLUSION AND**
4 **VALUATION OF NON-CO2 AVOIDED ENVIRONMENTAL EMISSIONS SUCH AS**
5 **NO_x AND SO₂?**

6 A. Yes. The Board determined that the NJCT would account for the benefits of avoided
7 greenhouse gas emissions, including methane and other non-CO₂ greenhouse gases, while the
8 public health benefits associated with the avoidance of other environmental emissions, including
9 criteria pollutants such as NO_x and SO₂, “will be reflected in the 5% general non-energy benefits
10 adder.”⁹¹

11 **Q. ARE THERE ANY CONCEPTUAL ISSUES WITH USING SO₂ AND NO_x COSTS**
12 **TO CALCULATE BENEFITS IN A REGULATORY FRAMEWORK?**

13 A. The use of non-market-based approaches to value air emissions is based upon the premise
14 that current clean air markets and EPA regulations do not value or control for air emissions
15 appropriately. These non-market approaches are also problematic in that the values presented
16 represent estimates, rather than reported data or valuations. They also cannot be tested or
17 verified to the true societal cost of the emission in question. This causes circumstances where
18 estimates of societal costs vary widely between researchers.

19 **Q. DOES THE EPA NOTE A DEGREE OF UNCERTAINTY IN ITS ANALYSIS?**

20 A. Yes. The EPA fully admits that the nature of its analysis includes some range of
21 uncertainty at many stages of its analysis. Further, the EPA notes that these uncertainties have a
22 compounded effect on the overall certainty of its analysis.

⁹¹ NJ Cost Test Order, Appendix B, pp. 9-10.

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1 This analysis includes many data sources as inputs, including
2 emission inventories, air quality data from models (with their
3 associated parameters and inputs), population data, health effect
4 estimates from epidemiology studies, and economic data for
5 monetizing benefits. Each of these inputs may be uncertain and
6 would affect the benefits estimate. **When the uncertainties from**
7 **each stage of the analysis are compounded, small uncertainties**
8 **can have large effects on the total quantified benefits.**⁹²

9 **Q. ARE THERE CURRENTLY ANY TRADABLE ALLOWANCE MARKETS THAT**
10 **VALUE THESE POLLUTANTS?**

11 A. Yes. Title IV of the 1990 amendments to the Clean Air Act required major emission
12 reductions in both NO_x and SO₂ from the power sector in a goal of reducing the formation of
13 acid rain. The EPA established the Acid Rain Program, which used market-based incentives to
14 reduce emissions of these pollutant through a system of allowance trading.⁹³ The Acid Rain
15 Program was the nation's first established cap and trade program, and electric generation units
16 still must purchase allowance credits associated with projected emissions through the program.
17 Costs associated with the purchase of these emissions credits are priced by generation units as a
18 variable operating cost and thus included in final wholesale energy prices.

19 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THE INCLUSION OF**
20 **BENEFITS ASSOCIATED WITH AVOIDED ENVIRONMENTAL EMISSIONS?**

21 A. I recommend the Board not include any benefit associated with avoided NO_x and SO₂
22 emissions. The benefits purported by the Company are speculative in terms of both avoided
23 formation of PM_{2.5} and the negative monetary impact these emissions cause on citizens of New
24 Jersey. Further, and most importantly, NO_x and SO₂ emissions are already valued within New

⁹² Technical Support Document: Estimating the Benefits per Ton of Reducing PM_{2.5} Precursors from 17 Sectors (February 2018); U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards, at 25.

⁹³ See, Acid Rain Program, available online at: <https://www.epa.gov/acidrain/acid-rain-program>.

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1 Jersey through wholesale electricity prices which includes the cost of compliance with existing
2 clean air markets and other EPA regulations.

3 e. **CBAS ARE INCOMPLETE AND DO NOT ADEQUATELY ADDRESS**
4 **RATE IMPACTS AND OMIT UTILITY RETURNS ON INVESTMENT**
5 **FROM COSTS**

6 **Q. WILL THE PROGRAMS AND MEASURES ANALYZED IN THE COMPANY'S**
7 **CBA BE IMPLEMENTED AS MODELED?**

8 A. Before being implemented, the proposed programs and measures will reflect the input of
9 various planned working groups. The Company expects "these groups to provide
10 recommendations that can shape the strategies and activities for this first triennial program cycle.
11 ... However [NJNG is] not able to do so since these working groups have not been launched at
12 the time of the filing. Any effort to submit a detailed plan at this time could not reflect the input
13 of these working groups."⁹⁴ In addition, the utilities have not yet reached agreement on all of the
14 elements of the Core Programs or selected a Statewide Coordinator, who will also have input on
15 program implementation.⁹⁵

16 **Q. ARE THE COSTS INCLUDED IN THE COMPANY'S CBA BASED ON TOTAL**
17 **DELIVERY COSTS THAT INCLUDE THE RETURN ASSOCIATED WITH THESE**
18 **EFFICIENCY INVESTMENTS?**

19 A. No, the Company's CBA utilizes costs that are based on total expenditure levels only and
20 do not include the return on investment that will be provided to the Company's shareholders for
21 making these efficiency investments. While the inclusion of these costs in certain CBAs may be
22 debatable, it is clearly the case that they should be included in the RIM analysis since that

⁹⁴ Peracchio Testimony, 23:13-18.

⁹⁵ Hausman Direct Testimony, 6:7-7:7.

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1 analysis is intended to “measures what happens to customer rates due to changes in utility
2 revenues and operating costs caused by the program.”⁹⁶

3 **Q. WHAT COSTS ARE INCLUDED IN THE COMPANY’S RIM TEST?**

4 A. The Company’s RIM test results only account for operating costs, program rebate costs,
5 reallocated distribution costs and reallocation of customer loans, and do not include any return
6 on invested capital for the Company and therefore does not fully account for the impact of its
7 efficiency programs on customer rates. The CSPM clearly indicates that the RIM test results can
8 be unreliable when the cost of financing efficiency program investments is not properly
9 included⁹⁷

10 **Q. HAS THE COMPANY PROVIDED DATA THAT DISAGGREGATES ITS**
11 **PORTFOLIO PROGRAM REVENUE REQUIREMENT ON PER MEASURE BASIS.**

12 A. No. Staff’s discovery request S-NJNG-ENE-1 which requested the Company provide “a
13 revenue requirement that identifies all estimated program costs and revenues for each program
14 on an annual basis.” The Company’s response referred to the “REVISED Schedule JMC-3,
15 pages 3-12 previously provided electronically to the parties on October 20, 2020.”⁹⁸ However it
16 is impossible to estimate costs and revenues on a program level from the referenced workpapers
17 since all of the formulas and links associated with these workpapers have been broken and the
18 individual cells are simply numbers listed in a “values only” format.

19 **Q. WHAT IS A CONSERVATION INCENTIVE PROGRAM (“CIP”)?**

20 A. The CEA requires utilities to make annual filings with the Board for the recovery of lost
21 revenue due to reduced sales resulting from the implementation of the energy efficiency and pea

⁹⁶ Baatz Direct Testimony, 6:19-21.

⁹⁷ CSPM, p. 15.

⁹⁸ Company Response to S-NJNG-ENE-1.

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1 demand reduction programs.⁹⁹ Pursuant to this requirement, the Board ordered that either accept
2 the Lost Revenue Adjustment Mechanism (“LRAM”) proposed by Staff or propose participation
3 in the CIP.¹⁰⁰ A CIP is a mechanism that encourages utility conservation efforts by separating
4 the link between customer usage and a company’s gross margin.¹⁰¹

5 **Q. DOES THE COMPANY HAVE A BOARD-APPROVED CIP?**

6 Yes, the Board established New Jersey’s CIP in 2006 as a pilot for the Company and the South
7 Jersey Gas Company, and subsequently modified and extended the CIP, with the most recent
8 approval by the Board in 2014.¹⁰² The Company’s CIP includes ratepayer protections such as an
9 earnings test, rate caps on amounts collected from ratepayers, and required shareholder
10 contributions.¹⁰³

11 **Q. HAS THE COMPANY PROPOSED ANY CHANGES OR MODIFICATIONS TO**
12 **ITS CIP?**

13 A. No, the Company is not proposing any modifications to its existing CIP.¹⁰⁴

14 **Q DO YOU HAVE ANY PROPOSED CHANGES OR MODIFICATIONS TO THE**
15 **COMPANY’S CIP?**

16 A. I recommend that the Board adopt cap on the CIP of 4.0 percent of variable margin
17 revenue for the first year of the program only to assure that these COVID-related revenue losses
18 are not assessed upon ratepayers during this critical recovery period. This cap is consistent with
19 the terms included in the recent settlement agreement between parties that was included in the

⁹⁹ CEA, 3.(e).1

¹⁰⁰ I/M/O Implementation of the CEA, BPU Dkt. Nos. QO19060748, QO19010040, and QO17091004, Order at 26-27 (June 10, 2020), p. 26-27; Company Exhibit P-1, p. 12.

¹⁰¹ I/M/O Implementation of the CEA, BPU Dkt. Nos. QO19060748, QO19010040, and QO17091004, Order at 26-27 (June 10, 2020), p. 26-27; Petition, Exhibit P-1, p. 12.

¹⁰² Petition, Exhibit P-1, p. 12.

¹⁰³ Petition, Exhibit P-1, p. 12.

¹⁰⁴ Company Response to S-NJNG-ENE-3

PUBLIC

1 Board's Order Adopting Stipulation between PSEG, Board Staff, Rate Counsel and certain
2 intervenors in Docket Nos GO18101112 and EO18101113 "in light of the current pandemic."¹⁰⁵

3 My proposed cap would protect ratepayers from a large increase in CIP due to reductions
4 in demand caused by the pandemic, without unduly limiting the Company's CIP recoveries. To
5 illustrate, first note that in its most recent CIP review and revision filing, the Company reported
6 Variable Margin Revenues of \$277.4 million for the year ended September 2020.¹⁰⁶ Based on
7 those revenues, my proposed 4.0 percent cap would allow the Company to recover roughly \$11.1
8 million in non-weather margin during the first program year. As the Company reported \$3.9
9 million of non-weather margin deficiencies for the year ended September 2020, my proposed cap
10 would limit the increase in CIP to roughly \$6.2 million for the full year ending September
11 2021.¹⁰⁷

12

¹⁰⁵ I/M/O The Petition of Public Service Electric and Gas Company for Approval of Its Clean Energy Future Energy Efficiency ("CEF-EE") Program on a Regulated Basis, BPU Dkt. Nos. GO18101112 & EO18101113, Order at 20, 23 (Sept, 23, 2020).

¹⁰⁶ <https://www.njng.com/regulatory/pdf/NJNG-2021-Annual-BGSS-and-CIP-Filing-transmittal.pdf>.

¹⁰⁷ <https://www.njng.com/regulatory/pdf/NJNG-2021-Annual-BGSS-and-CIP-Filing-transmittal.pdf>.

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1 VII. RECOMMENDATIONS AND CONCLUSIONS

2 Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS

3 A. The Company's NJCT benefit-to-cost analysis shows that three utility-led programs,
4 QHEC, Moderate Income Weatherization, and Energy Management are not cost-effective.
5 Furthermore, the benefit-to-cost ratios the Company calculates for its proposed programs under
6 the NJCT is overstated and unreliable, as is its other CBA. In the partially corrected versions of
7 the Company's NJCT that I report, one core program, HPwES, and two additional utility-led
8 programs, Engineered Solutions, and Hybrid Heat also fail the test for cost-effectiveness under
9 the NJCT. I do not oppose the adoption of the QHEC, Moderate Income Weatherization, Energy
10 Management, HPwES or Engineered Solutions programs since these programs, while having
11 benefit-cost ratios less than one, either (a) represent the continuation of an existing program, (b)
12 serve the needs of low-income customers, or (c) ensure universal access to energy efficiency.
13 However, I do recommend the Board reject the Hybrid Heat program since it is not a
14 continuation of an existing program, is not intended to promote the adoption of other measures,
15 nor does it serve the needs of low-income customers or ensure universal access to energy
16 efficiency. Additional reasons why the Board should reject this program are addressed in the
17 Direct Testimony of Rate Counsel witness Ezra D. Hausman, PhD.

18 In addition, I recommend that the Company's existing CIP be modified so as to prevent
19 the Company from recouping lost revenues attributable to the COVID pandemic and resulting
20 economic recession as these lost revenues are unrelated to the Company's conservation efforts
21 and SAVEGREEN program. I recommend that the Board adopt cap on the CIP of 4.0 percent of
22 variable margin revenue for the first year of the program only to assure that these COVID-related
23 revenue losses are not assessed upon ratepayers during this critical recovery period. This cap is

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1 consistent with the terms included in the recent settlement agreement between parties that was
2 included in the Board’s Order Adopting Stipulation between PSEG, Board Staff, Rate Counsel
3 and certain intervenors in Docket Nos GO18101112 and EO18101113 “in light of the current
4 pandemic.”¹⁰⁸

5 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY FILED ON**
6 **DECEMBER 15, 2020?**

7 A. Yes. However, I reserve the right to supplement my direct testimony at a later date given
8 the uncertainties and incomplete nature of the Company’s filing. As I noted earlier, there are
9 several utility working group meetings that are in process, or have yet to be initiated, that will
10 make decisions that will influence the Company’s final CBA results. I reserve the right to
11 supplement my testimony as more information becomes available from these working groups. In
12 addition, as I also noted earlier, several workpapers provided by the Company in discovery are
13 missing inputs, calculations, clear articulation of assumptions, and in many instances had pasted
14 values with formulas stripped out of their individual cells. I reserve the right to update my
15 testimony, if needed, should this information become available.

¹⁰⁸ I/M/O The Petition of Public Service Electric and Gas Company for Approval of Its Clean Energy Future Energy Efficiency (“CEF-EE”) Program on a Regulated Basis, BPU Dkt. Nos. GO18101112 & EO18101113, Order at 20, 23 (Sept. 23, 2020).

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EDUCATION

Ph.D., Economics, Florida State University, 1995.
M.S., Economics, Florida State University, 1992.
M.S., International Affairs, Florida State University, 1988.
B.A., History, University of West Florida, 1987.
A.A., Liberal Arts, Pensacola State College, 1985.

Master's Thesis: *Nuclear Power Project Disallowances: A Discrete Choice Model of Regulatory Decisions*

Ph.D. Dissertation: *An Empirical Examination of Environmental Externalities and the Least-Cost Selection of Electric Generation Facilities*

ACADEMIC APPOINTMENTS

Louisiana State University, Baton Rouge, Louisiana

Center for Energy Studies

2014-Current	Executive Director
2007-Current	Director, Division of Policy Analysis
2006-Current	Professor
2003-2014	Associate Executive Director
2001-2006	Associate Professor
1999-2001	Research Fellow and Adjunct Assistant Professor
1995-2000	Assistant Professor

College of the Coast and the Environment (Department of Environmental Studies)

2014-Current	Professor (Joint Appointment with CES)
2010-Current	Director, Coastal Marine Institute
2010-2014	Adjunct Professor

E.J. Ourso College of Business Administration (Department of Economics)

2006-Current	Adjunct Professor
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2001-2006 Adjunct Associate Professor
1999-2000 Adjunct Assistant Professor

Michigan State University, East Lansing, Michigan

Institute of Public Utilities

2018-current Senior Fellow

Florida State University, Tallahassee, Florida

College of Social Sciences, Department of Economics

1995 Instructor

PROFESSIONAL EXPERIENCE

Acadian Consulting Group, Baton Rouge, Louisiana

2001-Current Consulting Economist/Principal
1995-1999 Consulting Economist/Principal

Econ One Research, Inc., Houston, Texas

1999-2001 Senior Economist

Florida Public Service Commission, Tallahassee, Florida

Division of Communications, Policy Analysis Section

1995 Planning & Research Economist

Division of Auditing & Financial Analysis, Forecasting Section

1993 Planning & Research Economist
1992-1993 Economist

Project for an Energy Efficient Florida/FlaSEIA, Tallahassee, Florida

1994 Energy Economist

Ben Johnson Associates, Inc., Tallahassee, Florida

1991-1992 Research Associate
1989-1991 Senior Research Analyst
1988-1989 Research Analyst

GOVERNMENT APPOINTMENTS

2020-Current Co-Chairperson, Energy Advisory Committee, World Trade Center
New Orleans, Louisiana.
2017-Current Member, National Petroleum Council.
U.S. Department of Energy.
2007-Current Louisiana Representative, Interstate Oil and Gas Compact

	Commission; Energy Resources, Research & Technology Committee.
2007-Current	Louisiana Representative, University Advisory Board Representative; Energy Council (Center for Energy, Environmental and Legislative Research).
2005	Member, Task Force on Energy Sector Workforce and Economic Development (HCR 322).
2003-2005	Member, Energy and Basic Industries Task Force, Louisiana Economic Development Council
2001-2003	Member, Louisiana Comprehensive Energy Policy Commission.

PUBLICATIONS: BOOKS AND MONOGRAPHS

1. *Power System Operations and Planning in a Competitive Market.* (2002). With Fred I. Denny. New York: CRC Press.
2. *Distributed Energy Resources: A Practical Guide for Service.* (2000). With Ritchie Priddy. London: Financial Times Energy.

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2. "Current Trends and Issues in Reforming State-level Solar Net Energy Metering Policies." (2020). *Journal of Energy Law and Resources.* Vol. VIII: 419-451.
3. "A cash flow model of an integrated industrial CCS-EOR project in a petrochemical corridor: a case study in Louisiana. (2019). With Brian Snyder and Michael Layne. *International Journal of Greenhouse Gas Control.*
4. "Understanding the challenges of industrial carbon capture and storage: An example in a U.S. petrochemical corridor." (2019). With Michael Layne and Brian Snyder. *International Journal of Sustainable Energy* 38(1):13-23.
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6. "Understanding the challenges of industrial carbon capture and storage: an example in a U.S. petrochemical corridor." (2018). With Brian Snyder and Michael Layne. *International Journal of Sustainable Energy.*
7. "Sea level rise and coastal inundation: a case study of the Gulf Coast energy infrastructure." (2018). With Siddhartha Narra. *Natural Resources.* 9: 150-174.

8. "The energy pillars of society: perverse interactions among human resource use, the economy and environmental degradation." (2018). With Adrian R.H. Wiegman, John W. Day, Christopher F. D'Elia, Jeffrey S. Rutherford, Charles Hall. *BioPhysical Economics and Resource Quality*. 3(2) 1-16.
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10. "Identifying Vulnerabilities of Working Coasts Supporting Critical Energy Infrastructure." (2016). With Siddhartha Narra. *Water*. 8(1).
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13. "An Empirical Analysis of Differences in Interstate Oil and Natural Gas Drilling Activity." (2012). With Mark J. Kaiser and Christopher J. Peters. *Exploration & Production: Oil and Gas Review*. 30(1): 18-22.
14. "The Value of Lost Production from the 2004-2005 Hurricane Seasons in the Gulf of Mexico." (2009). With Mark J. Kaiser and Yunke Yu. *Journal of Business Valuation and Economic Loss Analysis*. 4(2).
15. "Estimating the Impact of Royalty Relief on Oil and Gas Production on Marginal State Leases in the US." (2006). With Jeffrey M. Burke and Dmitry V. Mesyanzhinov. *Energy Policy* 34(12): 1389-1398.
16. "Using Competitive Bidding As A Means of Securing the Best of Competitive and Regulated Worlds." (2004). With Tom Ballinger and Elizabeth A. Downer. *NRRI Journal of Applied Regulation*. 2 (November): 69-85. (Received 2005 Best Paper Award by NRRI)
17. "Deregulation of Generating Assets and the Disposition of Excess Deferred Federal Income Taxes." (2004). With K.E. Hughes II. *International Energy Law and Taxation Review*. 10 (October): 206-212.
18. "Reflections on the U.S. Electric Power Production Industry: Precedent Decisions Vs. Market Pressures." (2003). With Robert F. Cope III and John W. Yeargain. *Journal of Legal, Ethical, and Regulatory Issues*. Volume 6, Number 1.
19. "A is for Access: A Definitional Tour Through Today's Energy Vocabulary." (2001) *Public Resources Law Digest*. 38: 2.
20. "A Comment on the Integration of Price Cap and Yardstick Competition Schemes in Electrical Distribution Regulation." (2001). With Steven A. Ostrover. *IEEE Transactions on Power Systems*. 16 (4): 940 -942.

21. "Modeling Regional Power Markets and Market Power." (2001). With Robert F. Cope. *Managerial and Decision Economics*. 22:411-429.
22. "A Data Envelopment Analysis of Levels and Sources of Coal Fired Electric Power Generation Inefficiency" (2000). With Williams O. Olatubi. *Utilities Policy*. 9 (2): 47-59.
23. "Cogeneration and Electric Power Industry Restructuring" (1999). With Andrew N. Kleit. *Resource and Energy Economics*. 21:153-166.
24. "Capacity and Economies of Scale in Electric Power Transmission" (1999). With Robert F. Cope and Dmitry Mesyanzhinov. *Utilities Policy* 7: 155-162.
25. "Oil Spills, Workplace Safety, and Firm Size: Evidence from the U.S. Gulf of Mexico OCS." (1997). With O. O. Iledare, A. G. Pulsipher, and Dmitry Mesyanzhinov. *Energy Journal* 4: 73-90.
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5. "Applications for Distributed Energy Resources in Oil and Gas Production: Methods for Reducing Flare Gas Emissions and Increasing Generation Availability" (2000). With Ritchie D. Priddy. *Proceedings of the International Energy Foundation – ENERGEX 2000*. July.
6. "Power System Operations, Control, and Environmental Protection in a Restructured Electric Power Industry" (1998). With Fred I. Denny. *IEEE Proceedings: Large Engineering Systems Conference on Power Engineering*. June: 294-298.

7. "New Paradigms for Power Engineering Education." (1997). With Fred I. Denny. *Proceedings of the International Association of Science and Technology for Development*. October: 499-504.
8. "Safety Regulations, Firm Size, and the Risk of Accidents in E&P Operations on the Gulf of Mexico Outer Continental Shelf" (1996). With Allan Pulsipher, Omowumi Iledare, and Bob Baumann. *Proceedings of the American Society of Petroleum Engineers: Third International Conference on Health, Safety, and the Environment in Oil and Gas Exploration and Production*, June.
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6. "Analysis of the Economic Impact Associated with Oil and Gas Activities on State Leases." (2002). With Dmitry Mesyanzhinov, Robert H. Baumann, and Allan G. Pulsipher. *Proceedings of the 2002 National IMPLAN Users Conference*: 149-155.
7. "Do Deepwater Activities Create Different Impacts to Communities Surrounding the Gulf OCS?" (2001). *Proceedings of the International Association for Energy Economics: 2001: An Energy Odyssey?* April.
8. "Modeling the Economic Impact of Offshore Activities on Onshore Communities." (2000). With Williams O. Olatubi. *Proceedings of the 20th Annual Information Transfer Meeting*. U.S. Department of Interior, Minerals Management Service: New Orleans, Louisiana.

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4. "Alaskan North Slope Natural Gas Development." (2003). In *Natural Gas and Electric Industries Analysis 2003*. With William E. Nebesky, Dmitry Mesyanzhinov, and Jeffrey M. Burke. Edited by Robert Willett. Houston, TX: Financial Communications Company, 185-205.
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- Robert Willett. With Martin J. Collette, Ritchie D. Priddy, and Jeffrey M. Burke. Houston, TX: Financial Communications Company, 114-131.
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 7. "Electric Power Generation." (2000). In the *Macmillan Encyclopedia of Energy*. Edited by John Zumerchik. New York: Macmillan Reference.

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2. Review of ***Electricity Transmission Pricing and Technology***, edited by Michael Einhorn and Riaz Siddiqi. (Boston: Kluwer Academic Publishers, 1996) pp. 282. ISBN 0-7923-9643-X. *Energy Journal* 18 (1997): 146-148.
3. Review of ***Electric Cooperatives on the Threshold of a New Era*** by Public Utilities Reports. (Vienna, Virginia: Public Utilities Reports, 1996) pp. 232. ISBN 0-910325-63-4. *Energy Journal* 17 (1996): 161-62.

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28. "Opportunities for Carbon Capture, Utilization and Storage in Louisiana." (2020). *LOGA Industry Report*. Summer: 18-21.
29. "The Challenges of the Regulatory Review of Diversification Mergers." (2016). With Michael W. Deupree. *Electricity Journal*. 29 (2016): 9-14.
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3. *Principal Investigator.* Understanding MISO long term infrastructure needs and stakeholder positions. (2017). Midcontinent Independent System Operator. Total Project: \$9,500, six months. Status: Completed.
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 23. *Principal Investigator*. “Energy Policy Development in Louisiana.” Louisiana Department of Natural Resources. Total Project: \$150,000. Status: Completed.
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33. *Principal Investigator*. "An Examination of the Opportunities for Drilling Incentives on State Leases." (2004). With Robert H. Baumann and Kristi A. R. Darby. Louisiana Office of Mineral Resources. Total Project Funding: \$75,000. Status: Completed.
34. *Principal Investigator*. "An Examination on the Development of Liquefied Natural Gas Facilities on the Gulf of Mexico." (2004). With Dmitry V. Mesyanzhinov and Mark J. Kaiser. U.S. Department of the Interior, Minerals Management Service. Total Project Funding \$101,054. Status: Completed.
35. *Principal Investigator*. "Examination of the Economic Impacts Associated with Large Customer, Industrial Retail Choice." (2004). With Dmitry V. Mesyanzhinov. Louisiana Mid-Continent Oil and Gas Association. Total Project Funding: \$37,000. Status: Completed.
36. *Principal Investigator*. "Economic Opportunities from LNG Development in Louisiana." (2003). With Dmitry V. Mesyanzhinov. Metrovision/New Orleans Chamber of Commerce and the Louisiana Department of Economic Development. Total Project Funding: \$25,000. Status: Completed.
37. *Principal Investigator*. "Marginal Oil and Gas Properties on State Leases in Louisiana: An Empirical Examination and Policy Mechanisms for Stimulating Additional Production." (2002). With Robert H. Baumann and Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: \$72,000. Status: Completed.
38. *Principal Investigator*. "A Collaborative Investigation of Baseline and Scenario Information for Environmental Impact Statements." (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. U.S. Department of Interior, Minerals Management Service. Total Project Funding: \$557,744. Status: Awarded, In Progress.
39. *Co-Principal Investigator*. "An Analysis of the Economic Impacts of Drilling and Production Activities on State Leases." (2002). With Robert H. Baumann, Allan G. Pulsipher, and

- Dmitry V. Mesyanzhinov. Louisiana Office of Mineral Resources. Total Project Funding: \$8,000. Status: Completed.
40. *Principal Investigator*. "Cost Profiles and Cost Functions for Gulf of Mexico Oil and Gas Development Phases for Input Output Modeling." (1998). With Dmitry Mesyanzhinov and Allan G. Pulsipher. U.S. Department of Interior, Minerals Management Service. Total Project Funding: \$244,956. Status: Completed.
 41. *Principal Investigator*. "An Economic Impact Analysis of OCS Activities on Coastal Louisiana." (1998). With Dmitry Mesyanzhinov and David Hughes. U.S. Department of Interior, Minerals Management Service. Total Project Funding: \$190,166. Status: Completed.
 42. *Principal Investigator*. "Energy Conservation and Electric Restructuring in Louisiana." (1997). Louisiana Department of Natural Resources." Petroleum Violation Escrow Program Funds. Total Project Funding: \$43,169. Status: Completed.
 43. *Principal Investigator*. "The Industrial Supply of Electricity: Commercial Generation, Self-Generation, and Industry Restructuring." (1996). With Andrew Kleit. Louisiana Energy Enhancement Program, LSU Office of Research and Development. Total Project Funding: \$19,948. Status: Completed.
 44. *Co-Principal Investigator*. "Assessing the Environmental and Safety Risks of the Expanded Role of Independents in Oil and Gas E&P Operations on the U.S. Gulf of Mexico OCS." (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, Grant Number 95-0056. Total Project Funding: \$109,361. Status: Completed.

ACADEMIC CONFERENCE PAPERS/PRESENTATIONS

1. "The changing nature of Gulf of Mexico energy infrastructure." (2017). Session 3B: New Directions in Social Science Research. 27th Gulf of Mexico Region Information Technology Meetings. U.S. Department of the Interior, Bureau of Ocean Energy Management, Environmental Studies Program. New Orleans, LA. August 24.
2. "Capacity utilization, efficiency trends, and economic risks for modern CHP installations." (2017). U.S. Department of Energy, 2017 Industrial Energy Technology Conference, New Orleans, LA June 21.
3. "Vulnerability assessment of the central Gulf of Mexico coast using a multi-dimensional approach." (2016). With Siddhartha Narra. Eighth International Conference on Environmental Science and Technology. June 6-10, Houston, TX.
4. "The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks." (2015). With Gregory Upton. Southern Economic Association Meeting 2015. New Orleans, Louisiana. November 23.
5. "The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks" (2015). With Gregory Upton. 38th IAEE International Conference, Antalya, Turkey. May 26.

6. "Modifying Renewables Policies to Sustain Positive Economic and Environmental Change" (2015). IEEE Annual Green Technologies ("Greentech") Conference. April 17.
7. "The Gulf Coast Industrial Investment Renaissance and New CHP Development Opportunities." (2014). Industrial Energy and Technology Conference, New Orleans, Louisiana. May 20.
8. "Estimating Critical Energy Infrastructure Value at Risk from Coastal Erosion" (2014). With Siddhartha Narra. American's Estuaries: 7th Annual Summit on Coastal and Estuarine Habitat Restoration. Washington, D.C., November 3-6.
9. "Economies of Scale, Learning Curves, and Offshore Wind Development Costs" (2012). With Gregory Upton. Southern Economic Association Annual Conference, New Orleans, LA November 17.
10. "Analysis of Risk and Post-Hurricane Reaction." (2009). 25th Annual Information Transfer Meeting. U.S. Department of the Interior, Minerals Management Service. January 7.
11. "Legacy Litigation, Regulation, and Other Determinants of Interstate Drilling Activity Differentials." (2008). With Christopher Peters and Mark Kaiser. 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.
12. "Gulf Coast Energy Infrastructure Renaissance: Overview." (2008). 28th Annual USAEE/IAEE North American Conference: Unveiling the Future of Future of Energy Frontiers. New Orleans, LA, December 3.
13. "Understanding the Impacts of Katrina and Rita on Energy Industry Infrastructure." (2008). American Chemical Society National Meetings, New Orleans, Louisiana. April 7.
14. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2007). With Kristi A. R. Darby and Michelle Barnett. International Association for Energy Economics, Wellington, New Zealand, February 19.
15. "Regulatory Issues in Rate Design, Incentives, and Energy Efficiency." (2007). 34th Annual Public Utilities Research Center Conference, University of Florida. Gainesville, FL. February 16.
16. "An Examination of LNG Development on the Gulf of Mexico." (2007). With Kristi A.R. Darby. US Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 9.
17. "OCS-Related Infrastructure on the GOM: Update and Summary of Impacts." (2007). U.S. Department of the Interior, Minerals Management Service. 24th Annual Information Technology Meeting. New Orleans, LA. January 10.
18. "The Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2006). With Michelle Barnett. Third National Conference on Coastal and Estuarine Habitat Restoration. Restore America's Estuaries. New Orleans, Louisiana, December 11.

19. "The Impact of Implementing a 20 Percent Renewable Portfolio Standard in New Jersey." (2006). With Seth E. Cureington. Mid-Continent Regional Science Association 37th Annual Conference, Purdue University, Lafayette, Indiana, June 9.
20. "The Impacts of Hurricane Katrina and Rita on Energy Infrastructure Along the Gulf Coast." (2006). Environment Canada: 2006 Arctic and Marine Oilspill Program. Vancouver, British Columbia, Canada.
21. "Hurricanes, Energy Markets, and Energy Infrastructure in the Gulf of Mexico: Experiences and Lessons Learned." (2006). With Kristi A.R. Darby and Seth E. Cureington. 29th Annual IAEE International Conference, Potsdam, Germany, June 9.
22. "An Examination of the Opportunities for Drilling Incentives on State Leases in Louisiana." (2005). With Kristi A.R. Darby. 28th Annual IAEE International Conference, Taipei, Taiwan (June).
23. "Fiscal Mechanisms for Stimulating Oil and Gas Production on Marginal Leases." (2004). With Jeffrey M. Burke. International Association of Energy Economics Annual Conference, Washington, D.C. (July).
24. "GIS and Applied Economic Analysis: The Case of Alaska Residential Natural Gas Demand." (2003). With Dmitry V. Mesyanzhinov. Presented at the Joint Meeting of the East Lakes and West Lakes Divisions of the Association of American Geographers in Kalamazoo, MI, October 16-18.
25. "Are There Any In-State Uses for Alaska Natural Gas?" (2002). With Dmitry V. Mesyanzhinov and William E. Nebesky. IAEE/USAEE 22nd Annual North American Conference: "Energy Markets in Turmoil: Making Sense of It All." Vancouver, British Columbia, Canada. October 7.
26. "The Economic Impact of State Oil and Gas Leases on Louisiana." (2002). With Dmitry V. Mesyanzhinov. 2002 National IMPLAN Users' Conference. New Orleans, Louisiana, September 4-6.
27. "Moving to the Front of the Lines: The Economic Impact of Independent Power Plant Development in Louisiana." (2002). With Dmitry V. Mesyanzhinov and Williams O. Olatubi. 2002 National IMPLAN Users' Conference. New Orleans, Louisiana, September 4-6.
28. "New Consistent Approach to Modeling Regional Economic Impacts of Offshore Oil and Gas Activities in the Gulf of Mexico." (2002). With Vicki Zatarain. 2002 National IMPLAN Users' Conference. New Orleans, Louisiana, September 4-6.
29. "Distributed Energy Resources, Energy Efficiency, and Electric Power Industry Restructuring." (1999). American Society of Environmental Science Fourth Annual Conference. Baton Rouge, Louisiana. December.
30. "Estimating Efficiency Opportunities for Coal Fired Electric Power Generation: A DEA Approach." (1999). With Williams O. Olatubi. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November.

31. "Applied Approaches to Modeling Regional Power Markets." (1999.) With Robert F. Cope. Southern Economic Association Sixty-ninth Annual Conference. New Orleans, November 1999.
32. "Parametric and Non-Parametric Approaches to Measuring Efficiency Potentials in Electric Power Generation." (1999). With Williams O. Olatubi. International Atlantic Economic Society Annual Conference, Montreal, October.
33. "Asymmetric Choice and Customer Benefits: Lessons from the Natural Gas Industry." (1999). With Rachelle F. Cope and Dmitry Mesyanzhinov. International Association of Energy Economics Annual Conference. Orlando, Florida. August.
34. "Modeling Regional Power Markets and Market Power." (1999). With Robert F. Cope. Western Economic Association Annual Conference. San Diego, California. July.
35. "Economic Impact of Offshore Oil and Gas Activities on Coastal Louisiana" (1999). With Dmitry Mesyanzhinov. Annual Meeting of the Association of American Geographers. Honolulu, Hawaii. March.
36. "Empirical Issues in Electric Power Transmission and Distribution Cost Modeling." (1998). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association. Sixty-Eighth Annual Conference. Baltimore, Maryland. November.
37. "Modeling Electric Power Markets in a Restructured Environment." (1998). With Robert F. Cope and Dan Rinks. International Association for Energy Economics Annual Conference. Albuquerque, New Mexico. October.
38. "Benchmarking Electric Utility Distribution Performance." (1998) With Robert F. Cope and Dmitry Mesyanzhinov. Western Economic Association, Seventy-sixth Annual Conference. Lake Tahoe, Nevada. June.
39. "Power System Operations, Control, and Environmental Protection in a Restructured Electric Power Industry." (1998). With Fred I. Denny. IEEE Large Engineering Systems Conference on Power Engineering. Nova Scotia, Canada. June.
40. "Benchmarking Electric Utility Transmission Performance." (1997). With Robert F. Cope and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-seventh Annual Conference. Atlanta, Georgia. November 21-24.
41. "A Non-Linear Programming Model to Estimate Stranded Generation Investments in a Deregulated Electric Utility Industry." (1997). With Robert F. Cope and Dan Rinks. Institute for Operations Research and Management Science Annual Conference. Dallas Texas. October 26-29.
42. "New Paradigms for Power Engineering Education." (1997). With Fred I. Denny. International Association of Science and Technology for Development, High Technology in the Power Industry Conference. Orlando, Florida. October 27-30
43. "Cogeneration and Electric Power Industry Restructuring." (1997). With Andrew N. Kleit. Western Economic Association, Seventy-fifth Annual Conference. Seattle, Washington. July 9-13.

44. "The Unintended Consequences of the Public Utilities Regulatory Policies Act of 1978." (1997). National Policy History Conference on the Unintended Consequences of Policy Decisions. Bowling Green State University. Bowling Green, Ohio. June 5-7.
45. "Assessing Environmental and Safety Risks of the Expanding Role of Independents in E&P Operations on the Gulf of Mexico OCS." (1996). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 16th Annual Information Transfer Meeting. New Orleans, Louisiana.
46. "Empirical Modeling of the Risk of a Petroleum Spill During E&P Operations: A Case Study of the Gulf of Mexico OCS." (1996). With Omowumi Iledare, Allan Pulsipher, and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.
47. "Input Price Fluctuations, Total Factor Productivity, and Price Cap Regulation in the Telecommunications Industry" (1996). With Farhad Niami. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.
48. "Recovery of Stranded Investments: Comparing the Electric Utility Industry to Other Recently Deregulated Industries" (1996). With Farhad Niami and Dmitry Mesyanzhinov. Southern Economic Association, Sixty-Sixth Annual Conference. Washington, D.C.
49. "Spatial Perspectives on the Forthcoming Deregulation of the U.S. Electric Utility Industry." (1996) With Dmitry Mesyanzhinov. Southwest Association of American Geographers Annual Meeting. Norman, Oklahoma.
50. "Comparing the Safety and Environmental Performance of Offshore Oil and Gas Operators." (1995). With Allan Pulsipher, Omowumi Iledare, Dmitry Mesyanzhinov, William Daniel, and Bob Baumann. U.S. Department of Interior, Minerals Management Service, 15th Annual Information Transfer Meeting. New Orleans, Louisiana.
51. "Empirical Determinants of Nuclear Power Plant Disallowances." (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.
52. "A Cross-Sectional Model of IntraLATA MTS Demand." (1995). Southern Economic Association, Sixty-Fifth Annual Conference. New Orleans, Louisiana.

ACADEMIC SEMINARS AND PRESENTATIONS

1. Panelist. "Fuel Security, Resource Adequacy & Value of Transmission." (2019). 6th Annual Electricity Dialogue at Northwestern University: Energy and Capacity: Transitions? Northwestern University Center of Law, Regulation, and Economic Growth.
2. "Air Emissions Regulation and Policy: The Recently Proposed Cross State Air Pollution Rule and the Implications for Louisiana Power Generation." Lecture before School of the Coast & Environment. November 5, 2011.
3. "Energy Regulation: Overview of Power and Gas Regulation." Lecture before School of the Coast & Environment, Course in Energy Policy and Law. October 5, 2009.

4. "Trends and Issues in Renewable Energy." Presentation before the School of the Coast & Environment, Louisiana State University. Spring Guest Lecture Series. May 4, 2007.
5. "CES Research Projects and Status." Presentation before the U.S. Department of the Interior, Minerals Management Service, Outer Continental Shelf Scientific Committee Meeting, New Orleans, LA May 22, 2007.
6. "Hurricane Impacts on Energy Production and Infrastructure." Presentation Before the 53rd Mineral Law Institute, Louisiana State University. April 7, 2006.
7. "Trends and Issues in the Natural Gas Industry and the Development of LNG: Implications for Louisiana. (2004) 51st Mineral Law Institute, Louisiana State University, Baton Rouge, LA. April 2, 2004.
8. "Electric Restructuring and Conservation." (2001). Presentation before the Department of Electrical Engineering, McNeese State University. Lake Charles, Louisiana. May 2, 2001.
9. "Electric Restructuring and the Environment." (1998). Environment 98: Science, Law, and Public Policy. Tulane University. Tulane Environmental Law Clinic. March 7, New Orleans, Louisiana.
10. "Electric Restructuring and Nuclear Power." (1997). Louisiana State University. Department of Nuclear Science. November 7, Baton Rouge, Louisiana.
11. "The Empirical Determinants of Co-generated Electricity: Implications for Electric Power Industry Restructuring." (1997). With Andrew N. Kleit. Florida State University. Department of Economics: Applied Microeconomics Workshop Series. October 17, Tallahassee, Florida.

PROFESSIONAL AND CIVIC PRESENTATIONS

1. "Consumer Perspectives on the Rate Design of the Future." (2020). National Association of State Utility Consumer Advocates ("NASUCA"). Annual Conference, November 10.
2. "Evaluation of Louisiana's Depleted Gas Reservoirs for Geological Carbon Sequestration." (2020). Louisiana Mid-Continent Oil and Gas Association ("LMOGA") Carbon Capture and Underground Storage ("CCUS") Committee Meeting. August 25.
3. "The 2020 Gulf Coast Energy Outlook: COVID-19 update." (2020). Baton Rouge Area Chamber of Commerce Business Webinar. COVID-19 and Global Supply Impacts on the Capital Region and Louisiana Economies. Baton Rouge, LA. June 3.
4. "Ratepayer benefits of reforming PURPA". (2020). Harvard Electricity Policy Group Webinar. PURPA: A time to reform or reduce its role? March 26.
5. "Pipeline industry: economic trends and outlook". (2020). Joint Industry Association Annual Meeting. Louisiana Mid-Continent Oil and Gas Association ("LMOGA") and the Louisiana Oil and Gas Association ("LOGA"). Lake Charles, LA March 5.

6. "The outlook for natural gas: storm clouds ahead?" (2020). National Association of State Utility Consumer Advocates ("NASUCA"). Natural Gas Committee Webinar, February 26.
7. "The 2020 Gulf Coast Energy Outlook". (2020). University of Louisiana Lafayette, Southern Unconventional Resources Center for Excellence. Lafayette, LA February 16.
8. "Opportunities for carbon capture, utilization, and storage in the Louisiana chemical corridor". (2020). Air and Waste Management Association, Louisiana Section Luncheon. Gonzales, LA January 16.
9. Panelist. (2020). Baton Route Advocate, 2020 Economic Outlook Summit. Baton Rouge Advocate. January 8.
10. "2020 Louisiana business climate outlook: the view from the energy sector." (2019). American Council of Engineering Companies Fall Conference. November 21, 2019. Baton Rouge, LA
11. "The urgency of PURPA reform in protecting ratepayers." (2019). Americans for Tax Reform, Fall 2019 Coalition Leaders Summit, November 14, 2019. New Orleans, LA.
12. "Louisiana's coast and the energy industry." (2019). 2019 API Delta Chapter Joint Society Luncheon Meeting. November 12, 2019, New Orleans, LA.
13. "Reforming PURPA: implications for ratepayers." (2019). Thomas Jefferson Institute for Public Policy, Annual Energy Summit, State Policy Network Annual Meeting. Colorado Springs, CO, October 28.
14. "Natural gas outlook: supply, demand and prices." (2019). National Association of State Utility Consumer Advocates, Natural Gas Committee Monthly Meeting. July 30, 2019.
15. "The economic impacts and outlook for LNG development on the Gulf Coast." (2019). 73rd Annual Meeting of the Southern Legislative Conference of the Council of State Governments. New Orleans, LA, July 14. (prepared presentation, hurricane cancellation)
16. "Natural gas outlook: supply, demand, and prices." (2019). NASUCA Mid-Year Meeting. Portland, OR, June 20.
17. "Overview of Louisiana LNG issues and trends." (2019). Berlin: LNG, Energy Security, and Diversity Reporting Tour, LSU Center for Energy Studies. Baton Rouge, LA, May 9.
18. "Overview of Louisiana energy issues and outlook." (2019). Australian Media Visit, Greater New Orleans, Inc./Baton Rouge Area Foundation. Baton Rouge, LA, April 29.
19. "Gulf Coast Energy Outlook 2019: Regional trends and outlook." (2019). Women's Energy Network. Baton Rouge, LA, April 23.
20. "MISO Grid Vision 2033." (2019). 2019 Spring Regulator and Policymaker Forum. New Orleans, LA, April 15-16.
21. "Ratepayer benefits of reforming PURPA." (2019). LSU Center for Energy Studies Industry Advisory Council Meeting. March 27.

22. "Incentives, risk, and the changing nature of regulation." (2019). NASUCA Water Committee monthly meeting/webinar. March 13.
23. "Gulf Coast Energy Outlook 2019: Production, trade and infrastructure trends." (2019). 66th Annual Mineral Board Institute Meetings. Baton Rouge, LA, March 14.
24. "A golden age: energy outlook 2019." (2019). Engineering News Record Webinar. February 13.
25. Panelist. (2019). Baton Route Advocate, 2019 Economic Outlook Summit. Baton Rouge Advocate. January 8.
26. "MISO Grid Vision 2033." (2018). 2018 Winter Regulatory and Policymaker Forum. New Orleans, LA, December 11.
27. "Gulf Coast Energy Outlook 2019." (2018). LSU Center for Energy Studies, Baton Rouge, LA, Fall 2018.
28. "How LNG is transforming Louisiana's energy economy." (2018). Louisiana State Bar Association, Public Utility Section. Baton Rouge, LA, November 30.
29. "Overview of Louisiana LNG issues and trends." (2018). Kean Miller Law Firm: Energy and Environmental Practice Group. Baton Rouge, LA, November 28.
30. "Infrastructure and capacity: challenges for development." (2018). Society of Utility and Regulatory Financial Analysts (SURFA) Annual Meeting, New Orleans, LA, April 20.
31. "Louisiana industrial cogeneration trends." (2018). Annual Louisiana Solid Waste Association Conference, Lafayette, LA, March 16.
32. "Gulf Coast industrial development: overview of trends and issues." (2018). Gulf Coast Power Association Meetings, New Orleans, LA, February 8.
33. "Energy outlook – reflection on market trends and Louisiana implications." (2017). IberiaBank Corporation Bank Board of Directors Meeting, New Orleans, LA. November 15.
34. "Integrated carbon capture and storage in the Louisiana chemical corridor." (2017). Industry Associates Advisory Council Meeting, Baton Rouge, LA. November 7.
35. "The outlook for natural gas and energy development on the Gulf Coast." (2017). Louisiana Chemical Association, Annual Meeting, New Orleans, LA. October 26.
36. "Critical energy infrastructure: the big picture on resiliency research." (2017). National Academies of Science, Engineering, and Medicine. New Orleans, LA. September 18.
37. "The changing nature of Gulf of Mexico energy infrastructure." (2017). 27th Gulf of Mexico Region Information Technology Meetings, New Orleans, LA, August 24.
38. "Capacity utilization, efficiency trends, and economic risks for modern CHP installations." (2017). Industrial Energy Technology Conference, New Orleans, LA. June 21.
39. "Crude oil and natural gas outlook: Where are we and where are we going?" (2017). CCREDC Economic Trends Panel. Corpus Christi, TX, June 15.

40. "Navigating through the energy landscape." (2017). Baton Rouge Rotary Luncheon. Baton Rouge, LA, May 24.
41. "The 2017-2018 Louisiana energy outlook." (2017). Junior Achievement of Greater New Orleans, JA BizTown Speaker Series. New Orleans, LA, May 12.
42. "The Gulf Coast energy economy: trends and outlook." (2017). Society for Municipal Analysts. New Orleans, LA, April 21.
43. "Gulf coast energy outlook." (2017). E.J. Ourso College of Business, Dean's Advisory Council, Energy Committee Meeting. Baton Rouge, LA, March 31.
44. "Recent trends in energy: overview and impact for the banking community." (2017). Oil and Gas Industry Update, Louisiana Bankers Association. Baton Rouge, LA, March 24.
45. "How supply, demand and prices have influenced unconventional development." (2016). Energy Annual Meeting, CLEER-University Advisory Board Lecture. New Orleans, LA, September 17.
46. "The Basics of Natural Gas Production, Transportation, and Markets." (2016). Center for Energy Studies. Baton Rouge, LA, August 1.
47. "Gulf Coast industrial development: trends and outlook." (2016). Investor Relations Group Meeting, Edison Electric Institute. New Orleans, LA, June 23.
48. "The future of policy and regulation: Unlocking the Treasures of Utility Regulation." (2016). Annual Meeting, National Conference of Regulatory Attorneys. Tampa, FL, June 20.
49. "Utility mergers: where's the beef?". (2016). National Association of State Utility Consumer Advocates Mid-Year Meetings. New Orleans, LA, June 6.
50. "Overview of the Clean Power Plan and its application to Louisiana." (2016). Shell Oil Company Internal Meeting. April 12.
51. "Energy and economic development on the Gulf Coast: trends and emerging challenges." (2016). Gas Processors Association Meeting. New Orleans, LA, April 11.
52. "Unconventional Oil and Gas Drilling Trends and Issues." (2016). French Delegation Visit, LSU Center for Energy Studies. March 16.
53. "Gulf Coast Industrial Growth: Passing clouds or storms on the horizon?" (2016). Gulf Coast Power Association Meetings. New Orleans, LA, February 18.
54. "The Transition to Crisis: What do the recent changes in energy markets mean for Louisiana?" (2016). Louisiana Independent Study Group. February 2.
55. "Regulatory and Ratepayer Issues in the Analysis of Utility Natural Gas Reserves Purchases" (2016). National Association of State Utility Consumer Advocates Gas Consumer Monthly Meeting. January 25.
56. "Emerging Issues in Fuel Procurement: Opportunities & Challenges in Natural Gas Reserves Investment." (2015). National Association of State Utility Consumer Advocates Annual Meeting. Austin, Texas. November 9.

57. "Trends and Issues in Net Metering and Solar Generation." (2015). Louisiana Rural Electric Cooperative Meeting. November 5.
58. "Electric Power: Industry Overview, Organization, and Federal/State Distinctions." (2015). EUCI. October 16.
59. "Natural Gas 101: The Basics of Natural Gas Production, Transportation, and Markets." (2015). Council of State Governments Special Meeting on Gas Markets. New Orleans, LA. October 14.
60. "Update and General Business Matters." (2015). CES Industry Associates Meeting. Baton Rouge, Louisiana. Fall 2015.
61. "The Impact of Infrastructure Cost Recovery Mechanisms on Pipeline Replacements and Leaks." (2015). 38th IAEE 2015 International Conference. Antalya, Turkey. May 26.
62. "Industry on the Move – What's Next?" (2015). Event Sponsored by Regional Bank and 1012 Industry Report. May 5.
63. "The State of the Energy Industry and Other Emerging Issues." (2015). Lex Mundi Energy & Natural Resources Practice Group Global Meeting. May 5.
64. "Energy, Louisiana, and LSU." (2015). LSU Science Café. Baton Rouge, Louisiana. April 28.
65. "Energy Market Changes and Impacts for Louisiana." (2015). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 22.
66. "Incentives, Risk and the Changing Nature of Utility Regulation." (2015). NARUC Staff Subcommittee on Accounting and Finance Meetings, New Orleans, Louisiana. April 22.
67. "Modifying Renewables Policies to Sustain Positive and Economic Change." (2015). IEEE Annual Green Technologies ("Greentech Conference"). April 17.
68. "Louisiana's Changing Energy Environment." (2015). John P. Laborde Energy Law Center Advisory Board Spring Meeting, Baton Rouge, Louisiana. March 27.
69. "The Latest and the Long on Energy: Outlooks and Implications for Louisiana." (2015). Iberia Bank Advisory Board Meeting, Baton Rouge, Louisiana. February 23.
70. "A Survey of Recent Energy Market Changes and their Potential Implications for Louisiana." (2015). Vistage Group, New Orleans, Louisiana. February 4.
71. "Energy Prices and the Outlook for the Tuscaloosa Marine Shale." (2015). Baton Rouge Rotary Club, Baton Rouge, Louisiana. January 28.
72. "Trends in Energy & Energy-Related Economic Development." (2014). Miller and Thompson Presentation, Baton Rouge, Louisiana. December 30.
73. "Overview EPA's Proposed Rule Under Section 111(d) of the Clean Air Act: Impacts for Louisiana." (2014). Louisiana State Bar: Utility Section CLE Annual Meeting, Baton Rouge, Louisiana. November 7.
74. "Overview EPA's Proposed Clean Power Plan and Impacts for Louisiana." (2014). Clean

Cities Coalition Meeting, Baton Rouge, Louisiana. November 5.

75. "Impacts on Louisiana from EPA's Proposed Clean Power Plan." (2014). Air & Waste Management Annual Environmental Conference (Louisiana Chapter), Baton Rouge, Louisiana. October 29, 2014.
76. "A Look at America's Growing Demand for Natural Gas." (2014). Louisiana Chemical Association Annual Meeting, New Orleans, Louisiana. October 23.
77. "Trends in Energy & Energy-Related Economic Development." (2014). 2014 Government Finance Officer Association Meetings, Baton Rouge, Louisiana. October 9.
78. "The Conventional Wisdom Associated with Unconventional Resource Development." (2014). National Association for Business Economics Annual Conference, Chicago, Illinois. September 28.
79. Unconventional Oil & Natural Gas: Overview of Resources, Economics & Policy Issues. (2014). Society of Environmental Journalists Annual Meeting. New Orleans, Louisiana. September 4.
80. "Natural Gas Leveraged Economic Development in the South." (2014). Southern Governors Association Meeting, Little Rock, Arkansas. August 16.
81. "The Past, Present and Future of CHP Development in Louisiana." (2014). Louisiana Public Service Commission CHP Workshop, Baton Rouge, Louisiana. June 25.
82. "Regional Natural Gas Demand Growth: Industrial and Power Generation Trends." (2014). Kinetica Partners Shippers Meeting, New Orleans, Louisiana. April 30.
83. "The Technical and Economic Potential for CHP in Louisiana and the Impact of the Industrial Investment Renaissance on New CHP Capacity Development." (2014). Electric Power 2014, New Orleans, Louisiana. April 1.
84. "Industry Investments and the Economic Development of Unconventional Development." (2014). Tuscaloosa Marine Shale Conference & Expo, Natchez, Mississippi. March 31.
85. Discussion Panelist. Energy Outlook 2035: The Global Energy Industry and Its Impact on Louisiana, (2014). Grow Louisiana Coalition, Baton Rouge, Louisiana. March 18.
86. "Natural Gas and the Polar Vortex: Has Recent Weather Led to a Structural Change in Natural Gas Markets?" (2014). National Association of State Utility Consumer Advocates Monthly Gas Committee Meeting. February 19.
87. "Some Unconventional Thoughts on Regional Unconventional Gas and Power Generation Requirements." (2014). Gulf Coast Power Association Special Briefing, New Orleans, Louisiana. February 6.
88. "Leveraging Energy for Industrial Development." (2013). 2013 Governor's Energy Summit, Jackson, Mississippi. December 5.
89. "Natural Gas Line Extension Policies: Ratepayer Issues and Considerations." (2013). National Association of State Utility Consumer Advocates Annual Meeting, Orlando, Florida. November 19.

90. "Replacement, Reliability & Resiliency: Infrastructure & Ratemaking Issues in the Power & Natural Gas Distribution Industries." (2013). Louisiana State Bar, Public Utility Section Meetings. November 15.
91. "Natural Gas Markets: Leveraging the Production Revolution into an Industrial Renaissance." (2013). International Technical Conference, Houston, TX. October 11.
92. "Natural Gas, Coal & Power Generation Issues and Trends." (2013). Southeast Labor and Management Public Affairs Committee Conference, Chattanooga, Tennessee. September 27.
93. "Recent Trends in Pipeline Replacement Trackers." (2013). National Association of State Utility Consumer Advocates Monthly Gas Committee Meeting. September 19.
94. Discussion Panelist (2013). Think About Energy Summit, America's Natural Gas Alliance, Columbus Ohio. September 16-17.
95. "Future Test Years: Issues to Consider." (2013). National Regulatory Research Institute, Teleseminar on Future Test Years. August 28.
96. "Industrial Development Outlook for Louisiana." (2013). Louisiana Water Synergy Project Meetings, Jones Walker Law Firm, Baton Rouge, Louisiana. July 30.
97. "Natural Gas & Electric Power Coordination Issues and Challenges." (2013). Utilities State Government Organization Conference, Pointe Clear, Alabama. July 9.
98. "Natural Gas Market Issues & Trends." (2013). Western Conference of Public Service Commissioners, Santa Fe, New Mexico. June 3.
99. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Louisiana Chemical Association/Louisiana Chemical Industry Alliance Annual Legislative Conference, Baton Rouge, Louisiana. May 8.
100. "Infrastructure Cost Recovery Mechanism: Overview of Issues." (2013). Energy Bar Association Annual Meeting, Washington, D.C. May 1.
101. "GOM Offshore Oil and Gas." (2013). Energy Executive Roundtable, New Orleans, Louisiana. March 27.
102. "Louisiana Unconventional Natural Gas and Industrial Redevelopment." (2013). Risk Management Association Luncheon, March 21.
103. "Natural Gas Market Update and Emerging Issues." (2013). NASUCA Gas Committee Conference Call/Webinar, March 12.
104. "Unconventional Resources and Louisiana's Manufacturing Development Renaissance." (2013). Baton Rouge Press Club, De La Ronde Hall, Baton Rouge, LA, January 28.
105. "New Industrial Operations Leveraged by Unconventional Natural Gas." (2013) American Petroleum Institute-Louisiana Chapter. Lafayette, LA, Petroleum Club, January 14.
106. "What's Going on with Energy? How Unconventional Oil and Gas Development is Impacting Renewables, Efficiency, Power Markets, and All that Other Stuff." (2012).

- Atlanta Economics Club Monthly Meeting. Atlanta, GA. December 11.
107. "Trends, Issues, and Market Changes for Crude Oil and Natural Gas." (2012). East Iberville Community Advisory Panel Meeting. St. Gabriel, LA. September 26.
 108. "Game Changers in Crude and Natural Gas Markets." (2012). Chevron Community Advisory Panel Meeting. Belle Chase, LA, September 17.
 109. "The Outlook for Renewables in a Changing Power and Natural Gas Market." (2012). Louisiana Biofuels and Bioprocessing Summit. Baton Rouge, LA. September 11.
 110. "The Changing Dynamics of Crude and Natural Gas Markets." (2012). Chalmette Refining Community Advisory Panel Meeting. Chalmette, LA, September 11.
 111. "The Really Big Game Changer: Crude Oil Production from Shale Resources and the Tuscaloosa Marine Shale." (2012). Baton Rouge Chamber of Commerce Board Meeting. Baton Rouge, LA, June 27.
 112. "The Impact of Changing Natural Gas Prices on Renewables and Energy Efficiency." (2012). NASUCA Gas Committee Conference Call/Webinar. 12 June 2012.
 113. "Issues in Gas-Renewables Coordination: How Changes in Natural Gas Markets Potentially Impact Renewable Development" (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.
 114. "Issues in Natural Gas End-Uses: Are We Really Focusing on the Real Opportunities?" (2012). Energy Bar Association, Louisiana Chapter, Annual Meeting, New Orleans, LA. April 12, 2012.
 115. "The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana." (2012). Louisiana Oil and Gas Association Annual Meeting, Lake Charles, LA. February 27, 2012.
 116. "The Impact of Legacy Lawsuits on Conventional Oil and Gas Drilling in Louisiana." (2012) Louisiana Oil and Gas Association Annual Meeting. Lake Charles, Louisiana. February 27, 2012.
 117. "Louisiana's Unconventional Plays: Economic Opportunities, Policy Challenges. Louisiana Mid-Continent Oil and Gas Association 2012 Annual Meeting. (2012) New Orleans, Louisiana. January 26, 2012.
 118. "EPA's Recently Proposed Cross State Air Pollution Rule ("CSAPR") and Its Impacts on Louisiana." (2011). Bossier Chamber of Commerce. November 18, 2011.
 119. "Facilitating the Growth of America's Natural Gas Advantage." (2011). BASF U.S. Shale Gas Workshop Management Meeting. Florham Park, New Jersey. November 1, 2011.
 120. "CSAPR and EPA Regulations Impacting Louisiana Power Generation." (2011). Air and Waste Management Association (Louisiana Section) Fall Conference. Environmental Focus 2011: a Multi-Media Forum. Baton Rouge, LA. October 25, 2011.
 121. "Natural Gas Trends and Impact on Industrial Development." (2011). Central Gulf Coast Industrial Alliance Conference. Arthur R. Outlaw Convention Center. Mobile, AL.

September 22, 2011.

122. "Energy Market Changes and Policy Challenges." (2011). Southeast Manpower Tripartite Alliance ("SEMTA") Summer Conference. Nashville, TN September 2, 2011.
123. "EPA Regulations, Rates & Costs: Implications for U.S. Ratepayers." (2011). Workshop: "A Smarter Approach to Improving Our Environment." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 5, 2011.
124. Panelist/Moderator. Workshop: "Why Wait? Start Energy Independence Today." 38th Annual American Legislative Exchange Council ("ALEC") Meetings. New Orleans, LA. August 4, 2011.
125. "Facilitating the Growth of America's Natural Gas Advantage." Texas Chemical Council, Board of Directors Summer Meeting. San Antonio, TX. July 28, 2011.
126. "Creating Ratepayer Benefits by Reconciling Recent Gas Supply Opportunities with Past Policy Initiatives." National Association of State Utility Consumer Advocates ("NASUCA"), Monthly Gas Committee Meeting. July 12, 2011.
127. "Energy Market Trends and Policies: Implications for Louisiana." (2011). Lakeshore Lion's Club Monthly Meeting. Baton Rouge, Louisiana. June 20, 2011.
128. "America's Natural Gas Advantage: Securing Benefits for Ratepayers Through Paradigm Shifts in Policy." Southeastern Association of Regulatory Commissioners ("SEARUC") Annual Meeting. Nashville, Tennessee. June 14, 2011.
129. "Learning Together: Building Utility and Clean Energy Industry Partnerships in the Southeast." (2011). American Solar Energy Society National Solar Conference. Raleigh Convention Center, Raleigh, North Carolina. May 20, 2011.
130. "Louisiana Energy Outlook and Trends." (2011). Executive Briefing. Consul General of Canada. LSU Center for Energy Studies, Baton Rouge, Louisiana. May 24, 2011.
131. "Louisiana's Natural Gas Advantage: Can We Hold It? Grow It? Or Do We Need to be Worrying About Other Problems?" (2011). Louisiana Chemical Association Annual Legislative Conference, Baton Rouge, Louisiana, May 5, 2011.
132. "Energy Outlook and Trends: Implications for Louisiana. (2011). Executive Briefing, Legislative Staff, Congressman William Cassidy. LSU Center for Energy Studies, Baton Rouge, Louisiana. March 25, 2011.
133. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2011). Gas Committee, National Association of State Utility Consumer Advocates ("NASUCA"). February 15, 2011.
134. "Regulatory Issues in Inflation Adjustment Mechanisms and Allowances." (2010). 2010 Annual Meeting, National Association of State Utility Consumer Advocates ("NASUCA"), Omni at CNN Center, Atlanta, Georgia, November 16, 2010.
135. "How Current and Proposed Energy Policy Impacts Consumers and Ratepayers." (2010). 122nd Annual Meeting, National Association of Regulatory Utility Commissioners

- ("NARUC"), Omni at CNN Center, Atlanta, Georgia, November 15, 2010.
136. "Energy Outlook: Trends and Policies." (2010). 2010 Tri-State Member Service Conference; Arkansas, Louisiana, and Mississippi Electric Cooperatives. L'Auberge du Lac Casino Resort, Lake Charles, Louisiana, October 14, 2010.
 137. "Deepwater Moratorium and Louisiana Impacts." (2010). The Energy Council Annual Meeting. Gulf of Mexico Deepwater Horizon Accident, Response, and Policy. Beau Rivage Conference Center. Biloxi, Mississippi. September 25, 2010.
 138. "Overview on Offshore Drilling and Production Activities in the Aftermath of Deepwater Horizon." (2010) Jones Walker Banking Symposium. The Oil Spill: What Will it Mean for Banks in the Region? New Orleans, Louisiana. August 31, 2010.
 139. "Long-Term Energy Sector Impacts from the Oil Spill." (2010). Second Annual Louisiana Oil & Gas Symposium. The BP Gulf Oil Spill: Long-Term Impacts and Strategies. Baton Rouge Geological Society. August 16, 2010.
 140. "Overview and Issues Associated with the Deepwater Horizon Accident." (2010). Global Interdependence Meeting on Energy Issues. Baton Rouge, LA. August 12, 2010.
 141. "Overview and Issues Associated with the Deepwater Horizon Accident." (2010). Regional Roundtable Webinar. National Association for Business Economics. August 10, 2010.
 142. "Deepwater Moratorium: Overview of Impacts for Louisiana." Louisiana Association of Business and Industry Meeting. Baton Rouge, LA. June 25, 2010.
 143. Moderator. Senior Executive Roundtable on Industrial Energy Efficiency. U.S. Department of Energy Conference on Industrial Efficiency. Office of Renewable Energy and Energy Efficiency. Royal Sonesta Hotel, New Orleans, LA. May 21, 2010.
 144. "The Energy Outlook: Trends and Policies Impacting Southeastern Natural Gas Supply and Demand Growth." Second Annual Local Economic Analysis and Research Network ("LEARN") Conference. Federal Reserve Bank of Atlanta. March 29, 2010.
 145. "Natural Gas Supply Issues: Gulf Coast Supply Trends and Implications for Louisiana." Energy Bar Association, New Orleans Chapter Meeting. Jones Walker Law Firm. January 28, 2010, New Orleans, LA.
 146. "Potential Impacts of Federal Greenhouse Gas Legislation on Louisiana Industry." LCA Government Affairs Committee Meeting. November 10, 2009. Baton Rouge, LA
 147. "Regulatory and Ratemaking Issues Associated with Cost and Revenue Tracker Mechanisms." National Association of State Utility Consumer Advocates ("NASUCA") Annual Meeting. November 10, 2009.
 148. "Louisiana's Stakes in the Greenhouse Gas Debate." Louisiana Chemical Association and Louisiana Chemical Industry Alliance Annual Meeting: The Billing Dollar Budget Crisis: Catastrophe or Change? New Orleans, LA.
 149. "Gulf Coast Energy Outlook: Issues and Trends." Women's Energy Network, Louisiana Chapter. September 17, 2009. Baton Rouge, LA.

150. "Gulf Coast Energy Outlook: Issues and Trends." Natchez Area Association of Energy Service Companies. September 15, 2009, Natchez, MS.
151. "The Small Picture: The Cost of Climate Change to Louisiana." Louisiana Association of Business and Industry, U.S. Chamber of Commerce, Louisiana Oil and Gas Association, and LSU Center for Energy Studies Conference: Can Louisiana Make a Buck After Climate Change Legislation? August 21, 2009. Baton Rouge, LA.
152. "Carbon Legislation and Clean Energy Markets: Policy and Impacts." National Association of Conservation Districts, South Central Region Meeting. August 14, 2009. Baton Rouge, LA.
153. "Evolving Carbon and Clean Energy Markets." The Carbon Emissions Continuum: From Production to Consumption." Jones Walker Law Firm and LSU Center for Energy Studies Workshop. June 23, 2009. Baton Rouge, LA
154. "Potential Impacts of Cap and Trade on Louisiana Ratepayers: Preliminary Results." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.
155. "Natural Gas Outlook." (2009). Briefing before the Louisiana Public Service Commission. Business and Executive Meeting, May 12, 2009. Baton Rouge, LA.
156. "Gulf Coast Energy Outlook: Issues and Trends." (2009). ISA-Lafayette Technical Conference & Expo. Cajundome Conference Center. Lafayette, Louisiana. March 12, 2009.
157. "The Cost of Energy Independence, Climate Change, and Clean Energy Initiatives on Utility Ratepayers." (2009). National Association of Business Economics (NABE). 25th Annual Washington Economic Policy Conference: Restoring Financial and Economic Stability. Arlington, VA March 2, 2009.
158. Panelist, "Expanding Exploration of the U.S. OCS" (2009). Deep Offshore Technology International Conference and Exhibition. PennWell. New Orleans, Louisiana. February 4, 2009.
159. "Gulf Coast Energy Outlook." (2008.) Atmos Energy Regional Management Meeting. Louisiana and Mississippi Division. New Orleans, Louisiana. October 8, 2008.
160. "Background, Issues, and Trends in Underground Hydrocarbon Storage." (2008). Presentation before the LSU Center for Energy Studies Industry Advisory Board Meeting. Baton Rouge, Louisiana. August 27, 2008.
161. "Greenhouse Gas Regulations and Policy: Implications for Louisiana." (2008). Presentation before the Praxair Customer Seminar. Houston, Texas, August 14, 2008.
162. "Market and Regulatory Issues in Alternative Energy and Louisiana Initiatives." (2008). Presentation before the 2008 Statewide Clean Cities Coalition Conference: Making Sense of Alternative Fuels and Advanced Technologies. New Orleans, Louisiana, March 27, 2008.
163. "Regulatory Issues in Rate Design, Incentives, and Energy Efficiency." (2007)

- Presentation before the New Hampshire Public Utilities Commission. Workshop on Energy Efficiency and Revenue Decoupling. November 7, 2007.
164. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives, and Energy Efficiency." (2007). National Association of State Utility Consumer Advocates, Mid-Year Meeting. June 12, 2007.
 165. "Regulatory and Policy Issues in Nuclear Power Plant Development." (2007). LSU Center for Energy Studies Industry Advisory Council Meeting. Baton Rouge, LA. March 23, 2007.
 166. "Oil and Gas in the Gulf of Mexico: A North American Perspective." (2007). Canadian Consulate, Heads of Mission EnerNet Workshop, Houston, Texas. March 20, 2007.
 167. "Regulatory Issues for Consumer Advocates in Rate Design, Incentives & Energy Efficiency." (2007). National Association of State Utility Consumer Advocates ("NASUCA") Gas Committee Monthly Meeting. February 13, 2006.
 168. "Recent Trends in Natural Gas Markets." (2006). National Association of Regulatory Utility Commissioners, 118th Annual Convention. Miami, FL November 14, 2006.
 169. "Energy Markets: Recent Trends, Issues & Outlook." (2006). Association of Energy Service Companies (AESC) Meeting. Petroleum Club, Lafayette, LA, November 8, 2006.
 170. "Energy Outlook" (2006). National Business Economics Issues Council. Quarterly Meeting, Nashville, TN, November 1-2, 2006.
 171. "Global and U.S. Energy Outlook." (2006). Energy Virginia Conference. Virginia Military Institute, Lexington, VA October 17, 2006.
 172. "Interdependence of Critical Energy Infrastructure Systems." (2006). Cross Border Forum on Energy Issues: Security and Assurance of North American Energy Systems. Woodrow Wilson Center for International Scholars. Washington, DC, October 13, 2006.
 173. "Determining the Economic Value of Coastal Preservation and Restoration on Critical Energy Infrastructure." (2006) The Economic and Market Impacts of Coastal Restoration: America's Wetland Economic Forum II. Washington, DC September 28, 2006.
 174. "Relationships between Power and Other Critical Energy Infrastructure." (2006). Rebuilding the New Orleans Region: Infrastructure Systems and Technology Innovation Forum. United Engineering Foundation. New Orleans, LA, September 24-25, 2006.
 175. "Outlook, Issues, and Trends in Energy Supplies and Prices." (2006.) Presentation to the Southern States Energy Board, Associate Members Meeting. New Orleans, Louisiana. July 14, 2006.
 176. "Energy Sector Outlook." (2006). Baton Rouge Country Club Meeting. Baton Rouge, Louisiana. July 11, 2006.
 177. "Oil and Gas Industry Post 2005 Storm Events." (2006). American Petroleum Institute, Teche Chapter. Production, Operations, and Regulations Annual Meeting. Lafayette, Louisiana. June 29, 2006.
 178. "Concentration of Energy Infrastructure in Hurricane Regions." (2006). Presentation

- before the National Commission on Energy Policy Forum: Ending the Stalemate on LNG Facility Siting. Washington, DC. June 21, 2006.
179. "LNG—A Premier." (2006). Presentation Given to the U.S. Department of Energy's "LNG Forums." Los Angeles, California. June 1, 2006.
 180. "Regional Energy Infrastructure, Production and Outlook." (2006). Executive Briefing for Board of Directors, Louisiana Oil and Gas Plc., Enhanced Exploration, Inc. and Energy Self-Service, Inc. Covington, Louisiana, May 12, 2006.
 181. "The Impacts of the Recent Hurricane Season on Energy Production and Infrastructure and Future Outlook." Presentation before the Industrial Energy Technology Conference 2006. New Orleans, Louisiana, May 9, 2006.
 182. "Update on Regional Energy Infrastructure and Production." (2006). Executive Briefing for Delegation Participating in U.S. Department of Commerce Gulf Coast Business Investment Mission. Baton Rouge, Louisiana May 5, 2006.
 183. "Hurricane Impacts on Energy Production and Infrastructure." (2006). Presentation before the Interstate Natural Gas Association of America Mid-Year Meeting. Hyatt Regency Hill Country. April 21, 2006.
 184. "LNG—A Premier." Presentation Given to the U.S. Department of Energy's "LNG Forums." Astoria, Washington. April 28, 2006.
 185. Natural Gas Market Outlook. Invited Presentation Given to the Georgia Public Service Commission and Staff. Georgia Institute of Technology, Atlanta, Georgia. March 10, 2006.
 186. The Impacts of Hurricanes Katrina and Rita on Louisiana's Energy Industry. Presentation to the Louisiana Economic Development Council. Baton Rouge, Louisiana. March 8, 2006.
 187. Energy Markets: Hurricane Impacts and Outlook. Presentation to the 2006 Louisiana Independent Oil and Gas Association Annual Conference. L'Auberge du Lac Resort and Casino. Lake Charles, Louisiana. March 6, 2006
 188. Energy Market Outlook and Update on Hurricane Damage to Energy Infrastructure. Presentation to the Energy Council 2005 Global Energy and Environmental Issues Conference. Santa Fe, New Mexico, December 10, 2005.
 189. "Putting Our Energy Infrastructure Back Together Again." Presentation Before the 117th Annual Convention of the National Association of Regulatory Utility Commissioners (NARUC). November 15, 2005. Palm Springs, CA
 190. "Hurricanes and the Outlook for Energy Markets." Presentation before the Baton Rouge Rotary Club. November 9, 2005, Baton Rouge, LA.
 191. "Hurricanes, Energy Supplies and Prices." Presentation before the Louisiana Department of Natural Resources and Atchafalaya Basin Committee Meeting. November 8, 2005. Baton Rouge, LA.

192. "The Impact of the Recent Hurricane's on Louisiana's Energy Industry." Presentation before the Louisiana Independent Oil and Gas Association Board of Directors Meeting. November 8, 2005. Baton Rouge, LA.
193. "The Impact of the Recent Hurricanes on Louisiana's Infrastructure and National Energy Markets." Presentation before the Baton Rouge City Club Distinguished Speaker Series. October 13, 2005. Baton Rouge, LA.
194. "The Impact of the Recent Hurricanes on Louisiana's Infrastructure and National Energy Markets." Presentation before Powering Up: A Discussion About the Future of Louisiana's Energy Industry. Special Lecture Series Sponsored by the Kean Miller Law Firm. October 13, 2005. Baton Rouge, LA.
195. "The Impact of Hurricane Katrina on Louisiana's Energy Infrastructure and National Energy Markets." Special Lecture on Hurricane Impacts, LSU Center for Energy Studies, September 29, 2005.
196. "Louisiana Power Industry Overview." Presentation before the Clean Air Interstate Rule Implementation Stakeholders Meeting. August 11, 2005. Louisiana Department of Environmental Quality.
197. "CES 2005 Legislative Support and Outlook for Energy Markets and Policy." Presentation before the LMOGA/LCA Annual Post-Session Legislative Committee Meeting. August 10-13, 2005. Perdido Key, Florida.
198. "Electric Restructuring: Past, Present, and Future." Presentation to the Southeastern Association of Tax Administrators Annual Conference. Sheraton Hotel and Conference Facility. New Orleans, LA July 12, 2005.
199. "The Outlook for Energy." Lagniappe Studies Continuing Education Course. Baton Rouge, LA. July 11, 2005.
200. "The Outlook for Energy." Sunshine Rotary Club. Baton Rouge, LA. April 27, 2005.
201. "Background and Overview of LNG Development." Energy Council Workshop on LNG/CNG. Biloxi, Ms: Beau Rivage Resort and Hotel, April 9, 2005.
202. "Natural Gas Supply, Prices, and LNG: Implications for Louisiana Industry." Cytec Corporation Community Advisory Panel. Fortier, LA January 14, 2005.
203. "The Economic Opportunities for a Limited Industrial Retail Choice Plan." Louisiana Department of Economic Development. Baton Rouge, Louisiana. November 19, 2004.
204. "Energy Issues for Industrial Customers of Gas and Power." Louisiana Association of Business and Industry, Energy Council Meeting. Baton Rouge, Louisiana. October 11, 2004.
205. "Energy Issues for Industrial Customers of Gas and Power." Annual Meeting of the Louisiana Chemical Association and the Louisiana Chemical Industry Alliance. Point Clear, Alabama. October 8, 2004.

206. "Energy Issues for Industrial Customers of Gas and Power." American Institute of Chemical Engineers – New Orleans Section. New Orleans, LA. September 22, 2004.
207. "Natural Gas Supply, Prices and LNG: Implications for Louisiana Industry." Dow Chemical Company Community Advisory Panel Meeting. Plaquemine, LA. August 9, 2004.
208. "Energy Issues for Industrial Customers of Gas and Power." Louisiana Chemical Association Post-Legislative Meeting. Springfield, LA. August 9, 2004.
209. "LNG In Louisiana." Joint Meeting of the Louisiana Economic Development Council and the Governors Cabinet Advisory Council. Baton Rouge, LA. August 5, 2004.
210. "Louisiana Energy Issues." Louisiana Mid-Continent Oil and Gas Association Post Legislative Meetings. Sandestin, Florida. July 28, 2004.
211. "The Gulf South: Economic Opportunities Related to LNG." Presentation before the Energy Council's 2004 State and Provincial Energy and Environmental Trends Conference. Point Clear, AL, June 26, 2004.
212. "Natural Gas and LNG Issues for Louisiana." Presentation before the Rhodia Community Advisory Panel. May 20, 2004, Baton Rouge, LA.
213. "The Economic Opportunities for LNG Development in Louisiana." Presentation before the Louisiana Chemical Association Plant Managers Meeting. May 27, 2004. Baton Rouge, LA.
214. "The Economic Opportunities for LNG Development in Louisiana." Presentation before the Louisiana Chemical Association/Louisiana Chemical Industry Alliance Legislative Conference. May 26, 2004. Baton Rouge, LA.
215. "The Economic Opportunities for LNG Development in Louisiana." Presentation before the Petrochemical Industry Cluster, Greater New Orleans, Inc. May 19, 2004, Destrehan, LA.
216. "Industry Development Issues for Louisiana: LNG, Retail Choice, and Energy." Presentation before the LSU Center for Energy Studies Industry Associates. May 14, 2004, Baton Rouge, LA.
217. "The Economic Opportunities for LNG Development in Louisiana." Presentation before the Board of Directors, Greater New Orleans, Inc. May 13, 2004, New Orleans, LA.
218. "Natural Gas Outlook: Trends and Issues for Louisiana." Presentation before the Louisiana Joint Agricultural Association Meetings. January 14, 2004, Hotel Acadiana, Lafayette, Louisiana.
219. "Natural Gas Outlook" Presentation before the St. James Parish Community Advisory Panel Meeting. January 7, 2004, IMC Production Facility, Convent, Louisiana.
220. "Competitive Bidding in the Electric Power Industry." Presentation before the Association of Energy Engineers. Business Energy Solutions Expo. December 11-12, 2003, New Orleans, Louisiana.

221. "Regional Transmission Organization in the South: The Demise of SeTrans" Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. December 9, 2003. Baton Rouge, Louisiana.
222. "Affordable Energy: The Key Component to a Strong Economy." Presentation before the National Association of Regulatory Utility Commissioners ("NARUC"), November 18, 2003, Atlanta, Georgia.
223. "Natural Gas Outlook." Presentation before the Louisiana Chemical Association, October 17, 2003, Pointe Clear, Alabama.
224. "Issues and Opportunities with Distributed Energy Resources." Presentation before the Louisiana Biomass Council. April 17, 2003, Baton Rouge, Louisiana.
225. "What's Happened to the Merchant Energy Industry? Issues, Challenges, and Outlook" Presentation before the LSU Center for Energy Studies Industry Associates Advisory Council Meeting. November 12, 2002. Baton Rouge, Louisiana.
226. "An Introduction to Distributed Energy Resources." Presentation before the U.S. Department of Energy, Office of Renewable Energy and Energy Efficiency, State Energy Program/Rebuild America Conference, August 1, 2002, New Orleans, Louisiana.
227. "Merchant Energy Development Issues in Louisiana." Presentation before the Program Committee of the Center for Legislative, Energy, and Environmental Research (CLEER), Energy Council. April 19, 2002.
228. "Merchant Power Plants and Deregulation: Issues and Impacts." Presentation before 24th Annual Conference on Waste and the Environment. Sponsored by the Louisiana Department of Environmental Quality. Lafayette, Louisiana, Cajundome. March 18, 2002.
229. "Merchant Power and Deregulation: Issues and Impacts." Presentation before the Air and Waste Management Association Annual Meeting. Baton Rouge, LA, November 15, 2001.
230. "Moving to the Front of the Lines: The Economic Impact of Independent Power Production in Louisiana." Presentation before the LSU Center for Energy Studies Merchant Power Generation and Transmission Conference, Baton Rouge, LA. October 11, 2001.
231. "Economic Impacts of Merchant Power Plant Development in Mississippi." Presentation before the U.S. Oil and Gas Association Annual Oil and Gas Forum. Jackson, Mississippi. October 10, 2001.
232. "Economic Opportunities for Merchant Power Development in the South." Presentation before the Southern Governor's Association/Southern State Energy Board Meetings. Lexington, KY. September 9, 2001.
233. "The Changing Nature of the Electric Power Business in Louisiana." Presentation before the Louisiana Department of Environmental Quality. Baton Rouge, LA, August 27, 2001.
234. "Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Interagency Group on Merchant Power Development. Baton Rouge, LA, July 16, 2001.

235. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Office of the Governor. Baton Rouge, LA, July 16, 2001.
236. "The Changing Nature of the Electric Power Business in Louisiana: Background and Issues." Presentation before the Louisiana Department of Economic Development. Baton Rouge, LA, July 3, 2001.
237. "The Economic Impacts of Merchant Power Plant Development In Mississippi." Presentation before the Mississippi Public Service Commission. Jackson, Mississippi, March 20, 2001.
238. "Energy Conservation and Electric Restructuring." With Ritchie D. Priddy. Presentation before the Louisiana Department of Natural Resources. Baton Rouge, Louisiana, October 23, 2000.
239. "Pricing and Regulatory Issues Associated with Distributed Energy." Joint Conference by Econ One Research, Inc., the Louisiana State University Distributed Energy Resources Initiative, and the University of Houston Energy Institute: "Is the Window Closing for Distributed Energy?" Houston, Texas, October 13, 2000.
240. "Electric Reliability and Merchant Power Development Issues." Technical Meetings of the Louisiana Public Service Commission. Baton Rouge, LA. August 29, 2000.
241. "A Introduction to Distributed Energy Resources." Summer Meetings, Southeastern Association of Regulatory Utility Commissioners (SEARUC). New Orleans, LA. June 27, 2000.
242. Roundtable Moderator/Discussant. Mid-South Electric Reliability Summit. U.S. Department of Energy. New Orleans, Louisiana. April 24, 2000.
243. "Electricity 101: Definitions, Precedents, and Issues." Energy Council's 2000 Federal Energy and Environmental Matters Conference. Loews L'Enfant Plaza Hotel, Washington, D.C. March 11-13, 2000.
244. "LSU/CES Distributed Energy Resources Initiatives." Los Alamos National Laboratories. Office of Energy and Sustainable Systems. Los Alamos, New Mexico. February 16, 2000.
245. "Distributed Energy Resources Initiatives." Louisiana State University, Center for Energy Studies Industry Associates Meeting. Baton Rouge, Louisiana. December 15, 1999.
246. "Merchant Power Opportunities in Louisiana." Louisiana Mid-Continent Oil and Gas Association (LMOGA) Power Generation Committee Meetings. Baton Rouge, Louisiana. November 10, 1999.
247. Roundtable Discussant. "Environmental Regulation in a Restructured Market" The Big E: How to Successfully Manage the Environment in the Era of Competitive Energy. PUR Conference. New Orleans, Louisiana. May 24, 1999.
248. "The Political Economy of Electric Restructuring In the South" Southeastern Electric Exchange, Rate Section Annual Conference. New Orleans, Louisiana. May 7, 1999.

249. "The Dynamics of Electric Restructuring in Louisiana." Joint Meeting of the American Association of Energy Engineers and the International Association of Facilities Managers. Metairie, Louisiana. April 29, 1999.
250. "The Implications of Electric Restructuring on Independent Oil and Gas Operations." Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Lafayette, Louisiana, March 24, 1999.
251. "What's Happened to Electricity Restructuring in Louisiana?" Louisiana State University, Center for Energy Studies Industry Associates Meeting. March 22, 1999.
252. "A Short Course on Electric Restructuring." Central Louisiana Electric Company. Sales and Marketing Division. Mandeville, Louisiana, October 22, 1998.
253. "The Implications of Electric Restructuring on Independent Oil and Gas Operations." Petroleum Technology Transfer Council Workshop: Electrical Power Cost Reduction Methods in Oil and Gas Field Operations. Shreveport, Louisiana, October 13, 1998.
254. "How Will Utility Deregulation Affect Tourism." Louisiana Travel Promotion Association Annual Meeting, Alexandria, Louisiana. January 15, 1998.
255. "Reflections and Predictions on Electric Utility Restructuring in Louisiana." With Fred I. Denny. Louisiana State University, Center for Energy Studies Industry Associates Meeting. November 20, 1997.
256. "Electric Utility Restructuring in Louisiana." Hammond Chamber of Commerce, Hammond, Louisiana. October 30, 1997.
257. "Electric Utility Restructuring." Louisiana Association of Energy Engineers. Baton Rouge, Louisiana. September 11, 1997.
258. "Electric Utility Restructuring: Issues and Trends for Louisiana." Opelousas Chamber of Commerce, Opelousas, Louisiana. June 24, 1997.
259. "The Electric Utility Restructuring Debate In Louisiana: An Overview of the Issues." Annual Conference of the Public Affairs Research Council of Louisiana. Baton Rouge, Louisiana. March 25, 1997.
260. "Electric Restructuring: Louisiana Issues and Outlook for 1997." Louisiana State University, Center for Energy Studies Industry Associates Meeting, Baton Rouge, Louisiana, January 15, 1997.
261. "Restructuring the Electric Utility Industry." Louisiana Propane Gas Association Annual Meeting, Alexandria, Louisiana, December 12, 1996.
262. "Deregulating the Electric Utility Industry." Eighth Annual Economic Development Summit, Baton Rouge, Louisiana, November 21, 1996.
263. "Electric Utility Restructuring in Louisiana." Jennings Rotary Club, Jennings, Louisiana, November 19, 1996.
264. "Electric Utility Restructuring in Louisiana." Entergy Services, Transmission and Distribution Division, Energy Centre, New Orleans, Louisiana, September 12, 1996

265. "Electric Utility Restructuring" Louisiana Electric Cooperative Association, Baton Rouge, Louisiana, August 27, 1996.
266. "Electric Utility Restructuring -- Background and Overview." Louisiana Public Service Commission, Baton Rouge, Louisiana, August 14, 1996.
267. "Electric Utility Restructuring." Sunshine Rotary Club Meetings, Baton Rouge, Louisiana, August 8, 1996.
268. Roundtable Moderator, "Stakeholder Perspectives on Electric Utility Stranded Costs." Louisiana State University, Center for Energy Studies Seminar on Electric Utility Restructuring in Louisiana, Baton Rouge, May 29, 1996.
269. Panelist, "Deregulation and Competition." American Nuclear Society: Second Annual Joint Louisiana and Mississippi Section Meetings, Baton Rouge, Louisiana, April 20, 1996.

EXPERT WITNESS, LEGISLATIVE, AND PUBLIC TESTIMONY; EXPERT REPORTS, RECOMMENDATIONS, AND AFFIDAVITS

1. Answering Testimony. Docket No. RP20-614-000 and RP20-618-000. (2020). *Transcontinental Gas Pipe Line Company, LLC*. Issues: Tariff revisions, assessment of Transco claims.
2. Expert Testimony. Docket No. 16-036-FR. (2020). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. Direct and Surrebuttal. Issues: rate increases, investment and expenses trends, load forecast, historic year netting adjustment, reliability issues.
3. Expert Testimony. Docket No. 2019.12.101. (2020). Before the Public Service Commission of the State of Montana. In the Matter of NorthWestern Energy's Application for Approval of Capacity Resource Acquisition. Issues: sale of capital asset, evaluation benefits, ratepayer cost exposure, reserve fund.
4. Expert Testimony. Formal Case No. 1162. (2020). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service*. Issues: rate increase, revenue adjustment, weather normalization, rate design, revenue distribution.
5. Expert Testimony. Docket No. E-01345A-19-0236. (2020). Before the Arizona Corporation Commission. *In the Matter of the Application of Arizona Public Service Company for Ratemaking Purposes to Fix a Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop such Return*. Direct and Surrebuttal. Issues: Cost of Service, Revenue Distribution, Rate Design.
6. Expert Testimony. Docket No. 17-010-FR. (2020). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U*. Issues: rate increase, leak replacement and reduction, netting adjustment,

revenue deficiency, accounting policy changes.

7. Expert Testimony. Case No. U-20697. (2020). Before the Michigan Public Service Commission. *In the Matter of the Application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief.* Issues: cost of service, revenue distribution, rate design.
8. Expert Testimony. Docket No. 2019.09.058. (2020). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy's Annual PCCAM Filing and Application for Approval of Tariff Changes.* Issues: purchase power expenses, cost sharing, PCAAM power cost.
9. Expert Testimony. Formal Case No. 1156. (2020). Before the Public Service Commission of the District of Columbia. *In the matter of Potomac Electric Power Company for authority to implement a multiyear rate plan for electric distribution service in the district of Columbia.* Direct, Rebuttal, Surrebuttal, Supplemental, and Second Supplemental. Issues: revenue distribution, rate design, customer charge, performance metric policies, performance metric incentives.
10. Expert Testimony. Case No. U-20561. (2019). Before the Michigan Public Service Commission. *In the matter of the Application of DTE Electric Company for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority.* Issues: Cost of service, allocation of production plant, allocation of sub-transmission plant, revenue distribution.
11. Expert Testimony. Cause No. 45253. (2019). Before the Indiana Utility Regulatory Commission. *Petition of Duke Energy Indiana, LLC Pursuant to Ind. Code 8-1-2-42.7 and 8-1-2-61, for (1) Authority to Modify its Rates and Charges for Electric Utility Service through a Step-In of New Rates and Charges using a Forecasted Test Period; (2) Approval of New Schedules of Rates and Charges, General Rules and Regulations, and Riders; (3) Approval of a Federal Mandate Certificate Under Ind. Code 8-1-8.4-1; (4) Approval of Revised Electric Depreciation Rates Applicable to its Electric Plant in Service; (5) Approval of Necessary and Appropriate Accounting Deferral Relief; and (6) Approval of a Revenue Decoupling Mechanism for Certain Customers Classes.* Issues: Decoupling, revenue decoupling mechanism and design, commission policy, benchmarking analysis.
12. Expert Testimony. Docket 19-019-U. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Petition of Entergy Arkansas, LLC for Approval of a Build-Own-Transfer Arrangement for a Renewable Resource and for all other Related Approvals.* Issues: Solar investment, risk assessment, proposed rider.
13. Expert Testimony. Docket No. 16-036-FR. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U.* Issues: rate design, reliability, and formula rate plan.
14. Expert Testimony. Docket No. 19-019-U. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Petition of Entergy Arkansas, LLC for Approval of a Build-*

- Own-Transfer Arrangement for a Renewable Resource and for all other Related Approvals*. Issues: Solar project approval, ratepayer risk, cost allocation.
15. Expert Testimony. Docket No. 17-010-FR. (2019). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Centerpoint Energy Resources Corp. D/B/A Centerpoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U*. Issues: retail rates, leak analysis, revenue deficiency, investments.
 16. Expert Testimony. Case No. U-20471. (2019). Before the Michigan Public Service Commission. *In the matter of the Application of DTE Electric Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief*. Issues: load forecasting, least-cost system planning.
 17. Expert Report. Docket No. 18-004422. (2019). Before the State of Florida Division of Administrative Hearings. *Peoples Gas System vs. South Sumter Gas Company, LLC and the City of Leesburg*. Issues: retail rates, customer growth, sales trends and forecasts, policy, cost of service, socio-economic trends and forecasts.
 18. Expert Testimony. Docket Nos. GO18101112 and EO18101113. (2019). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric and Gas Company for Approval of its Clean Energy Future-Energy Efficiency (“CEF-EE”) Program on a Regulated Basis*. Issues: economic impact, cost benefit analysis, decoupling mechanisms.
 19. Expert Testimony. Docket Nos. EO18060629 and GO18060630. (2019). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric and Gas Company for Approval of the Second Energy Strong Program (Energy Strong II)*. Issues: economic impact, cost benefit analysis, infrastructure replacement, cost recovery tracker mechanisms.
 20. Expert Report. Docket No. 2011-AD-2. (2019). On Behalf of the Mississippi Public Service Commission. *Order Establishing Docket to Investigate the Development and Implementation of Net Metering Programs and Standards*. Issues: Net-metering, distributed generation.
 21. Expert Testimony. Docket No. D2018.2.12. (2018). Before the Public Service Commission of the State of Montana. *In the Matter of NorthWestern Energy’s Application for Authority to Increase Retail Electric Utility Service Rates and for Approval of Electric Service Schedules and Rules and Allocated Cost of Service and Rate Design*. Issues: Net-metering, cost of service, revenue distribution, rate design.
 22. Expert Testimony. Docket No. 19-SEPE-054-MER. (2018). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Sunflower Electric Power Corporation and Mid-Kansas Electric Company, Inc. for an Order Approving the Merger of Mid-Kansas Electric Company, Inc. into Sunflower Electric Power Corporation*. Issues: merger impacts, rates, tariffs.
 23. Expert Testimony. Docket No. 18-046-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Oklahoma Gas and Electric Company Pursuant to APSC Docket No. 16-052-U*. Issues: formula rate plan, plant

- investment and expenses benchmarking analysis, reliability.
24. Expert Testimony. Docket No. 16-036-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. Issues: rate design, reliability, and formula rate plan.
 25. Expert Testimony. Docket No. 2017-AD-0112. (2018). Before the Mississippi Public Service Commission. *In Re: Encouraging Stipulation of Matters in Connection with the Kemper County IGCC Project*. Issues: cost of service and rate design.
 26. Expert Affidavit. Docket No. 87011-E. (2018). Before the 16th Judicial District Court Parish of St. Martin State of Louisiana. *Bayou Bridge Pipeline, LLC versus 38.00 Acres, More or Less, Located in St. Martin Parish; Barry Scott Carline, et al.* Issues: economic impacts.
 27. Expert Testimony. Docket No. QO18080843. (2018). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Nautilus Offshore Wind, LLC for the Approval of the State Waters Wind Project and Authorizing Offshore Wind Renewable Energy Certificates*. Issues: regulatory policy and cost-benefit analyses.
 28. Expert Testimony. Docket No. ER18010029 and GR18010030. (2018). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Public Service Electric and Gas Company for Approval of an Increase in Electric and Gas Rates and for Changes in the Tariffs for Electric and Gas Service, B.P.U.N.J. No. 16 Electric and B.P.U.N.J No. 16 Gas, and for Changes in Depreciation Rates, Pursuant to N.J.S.A. 48:2-18, N.J.S.A. 48:2-21 and N.J.S.A. 48:2-21.1, and for Other Appropriate Relief*. Issues: rate proposal, revenue decoupling, regulatory policy, cost benchmarking.
 29. Expert Testimony. Docket No. T-34695. (2018). Before the Louisiana Public Service Commission. *In re: Application for a rate increase on service originating at Grand isle and termination at St. James for Crude Petroleum as currently outlined in LPSC Tariff No. 75.2*. Issues: cost of service, rate design, and alternative regulation.
 30. Expert Testimony. Docket No. 17-071-U. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Application of Black Hills Energy Arkansas, Inc. for Approval of a General Change in Rates and Tariffs*. Issues: cost of service, rate design, billing determinates.
 31. Expert Testimony. Docket No. 17-010-FR. (2018). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filing of CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U*. Issues: cost of service, rate design, alternative regulation, formula rate plan.
 32. Expert Testimony. Case No. PU-17-398. (2018). Before the North Dakota Public Service Commission. *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in North Dakota*. Issues: cost of service, marginal cost of service, and rate design.
 33. Expert Testimony. Docket No. 20170179-GU. (2018). Before the Florida Public Service Commission. *In re: Petition for rate increase and approval of depreciation study by Florida*

- City Gas*. On Behalf of the Citizens of the State of Florida. Issues: policy issues concerning long-term gas capacity procurement.
34. Expert Testimony. Docket No. 18-KCPE-095-MER. (2018). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Merger of Westar, Inc. and Great Plains Energy Incorporated*. On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger/acquisition policy, financial risk, and ring-fencing.
 35. Expert Testimony. Docket No. GR17070776. (2018). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism (“GSMP II”). Issues: economic impact, infrastructure replacement program rider, pipeline replacement, leak rate comparisons and cost benefit analysis.
 36. Expert Affidavit. Case No. 18-489. (2018). Before the Civil District Court for the Parish of Orleans, State of Louisiana. *Bayou Bridge Pipeline, LLC versus The White Castle Lumber and Shingle Company Limited and Jeanerette Lumber & Shingle CO. L.L.C.* Issues: economic impact of crude oil pipeline development.
 37. Expert Testimony. Docket No. 16-036-FR. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U*. On behalf of the Office of the Arkansas Attorney General Leslie Rutledge. Issue: cost of service, rate design, alternative regulation, formula rate plan.
 38. Expert Testimony. Docket No. 2017-AD-0112. (2017). Before the Mississippi Public Service Commission. *In re: Encouraging Stipulation of Matters in Connection with the Kemper County IGCC Project*. On Behalf of the Mississippi Public Utilities Staff. Issues: financial analysis, rates and cost trends, economic impacts of proposal.
 39. Expert Testimony. Case No. 2017-00179. (2017). Before the Public Service Commission, Commonwealth of Kentucky. *Electronic Application of Kentucky power Company For (1) A General Adjustment of Its Rates for Electric Service; (2) An Order Approving Its 2017 Environmental Compliance Plan; (3) An Order Approving Its Tariffs and Riders; (4) An Order Approving Accounting Practices to Establish a Regulatory Asset or Liability Related to the Big Sandy 1 Operation Rider; and (5) An Order Granting All Other Required Approvals and Relief*. Issues: rate design, revenue allocation, economic development.
 40. Expert Testimony. Docket No. 17-010-FR. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filing of CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Arkansas Gas Pursuant to APSC Docket No. 15-098-U*. Issues: cost of service, rate design, alternative regulation, formula rate plan.
 41. Expert Testimony. Formal Case No. 1142. (2017). Before the Public Service Commission of the District of Columbia. *In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.* On Behalf of the Office of the People’s Counsel. Issues: merger/acquisition policy,

- financial risk, ring-fencing, and reliability.
42. Expert Testimony. D.P.U. 17-05. (2017). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00.* On Behalf of the Massachusetts Office of the Attorney General Office of Ratepayer Advocacy. Issues: performance-based ratemaking, multi-factor productivity estimation.
 43. Deposition and Testimony. (2017) Before the Nebraska Section 70, Article 13 Arbitration Panel. *Northeast Nebraska Public Power District, City of South Sioux City Nebraska; City of Wayne, Nebraska; City of Valentine, Nebraska; City of Beatrice, Nebraska; City of Scribner, Nebraska; Village of Walthill, Nebraska, vs. Nebraska Public Power District.* On the Behalf of Baird Holm LLP for the Plaintiffs. Issues: rate discounts; cost of service; utility regulation, economic harm.
 44. Expert Testimony. Docket No. 16-052-U. (2017). Before the Arkansas Public Service Commission. *In the Matter of the Application of the Oklahoma Gas and Electric Company for Approval of a General Change in Rates, Charges and Tariffs.* On the Behalf of the Office of Arkansas Attorney General Leslie Rutledge. Issues: cost of service, rate design, alternative regulation, formula rate plan.
 45. Expert Testimony. Docket No. 16-KCPE-593-ACQ. (2016). Before the Kansas Corporation Commission. *In the Matter of the Joint Application of Great Plains Energy Incorporated, Kansas City Power & Light Company, and Westar Energy, Inc. for Approval of the Acquisition of Westar, Inc. by Great Plains Energy Incorporated.* On the Behalf of the Kansas Electric Power Cooperative, Inc. Issues: merger/acquisition policy, financial risk, and ring-fencing.
 46. Expert Testimony. Formal Case No. 1139. (2016). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service.* On the Behalf of the Office of the People's Counsel for the District of Columbia. Issues: cost of service, rate design, alternative regulation.
 47. Expert Affidavit. Docket No. CP15-558-000 (2016). Before the United States of America Federal Energy Regulatory Commission. *PennEast Pipeline Company, LLC.* Affidavit and Reply Affidavit. On the Behalf of the New Jersey Division of Rate Counsel. Issues: pipeline capacity, peak day requirements.
 48. Expert Testimony. Docket No. RPU-2016-0002. (2016). Before the Iowa Utilities Board. *In re: Iowa American Water Company application for revision of rates.* On behalf of the Citizens of the State of Florida. Issue: revenue stabilization mechanism, revenue decoupling.
 49. Expert Testimony. Docket No. 15-015-U. (2016). Before the Arkansas Public Service Commission. *In the Matter of the Formula Rate Plan Filings of Entergy Arkansas, Inc., Pursuant to APSC Docket No. 15-015-U.* On behalf of the Office of the Arkansas Attorney General Leslie Rutledge. Issue: formula rate plan evaluation.

50. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated)*. On behalf of the Citizens of the State of Florida. Issue: load forecasting.
51. Expert Testimony. Docket Nos. 160021-EI, 160061-EI, 160062-EI, and 160088-EI. (2016). Before the Florida Public Service Commission. *In re: Petition for rate increase by Florida Power & Light Company (consolidated)*. On behalf of the Citizens of the State of Florida. Issue: off-system sales incentives.
52. Expert Testimony. Project No. 5-103. (2016). United States of America Federal Energy Regulatory Commission. *Confederated Salish and Kootenai Tribes Energy Keepers, Incorporated*. On behalf of the Flathead, Mission, and Jocko Valley Irrigation Districts and the Flathead Joint Board of Control of the Flathead, Mission, and Jocko Valley Irrigation Districts.
53. Expert Testimony. Docket No. 15-098-U. (2016). Before the Arkansas Public Service Commission. *In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas for a General Change or Modification in its Rates, Charges and Tariffs*. On behalf of the Office of the Arkansas Attorney General. Issues: formula rate plan, cost of service and rate design.
54. Expert Testimony. BPU Docket No. GM15101196. (2016). *In the Matter of the Merger of Southern Company and AGL Resources, Inc.* On behalf of the New Jersey Division of Rate Counsel. Issues: merger standards of review, customer dividend contributions, synergy savings and costs to achieve, ratemaking treatment of merger-related costs.
55. Expert Testimony. Docket No. 15-078-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Joint Application of SourceGas Inc., SourceGas LLC, SourceGas Holdings LLC and Black Hills Utility Holdings, Inc. for all Necessary Authorizations and Approvals for Black Hills Utility Holdings, Inc. to Acquire SourceGas Holdings LLC*. On behalf of the Office of the Arkansas Attorney General. Issues: public policy and regulatory policy associated with the acquisition.
56. Expert Testimony. Docket No. 15-031-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of SourceGas Arkansas Inc. for an Order Approving the Acquisition of Certain Storage Facilities and the Recovery of Investments and Expenses Associated Therewith*. On behalf of the Office of the Arkansas Attorney General. Issues: cost-benefit analysis, transmission cost analysis, and a due diligence analysis.
57. Expert Testimony. Docket No. 15-015-U. (2015). Before the Arkansas Public Service Commission. *In the Matter of the Application of Entergy Arkansas, Inc. for Approval of Changes in Rates for Retail Electric Service*. On behalf of the Office of the Arkansas Attorney General. Issues: economic development riders and production plant cost allocation.
58. Expert Testimony. Docket No. 7970. (2015). Before the Vermont Public Service Board. *Petition of Vermont Gas Systems, Inc., for a certificate of public good pursuant to 30*

V.S.A. § 248, authorizing the construction of the "Addison Natural Gas Project" consisting of approximately 43 miles of new natural gas transmission pipeline in Chittenden and Addison Counties, approximately 5 miles of new distribution mainlines in Addison County, together with three new gate stations in Williston, New Haven, and Middlebury, Vermont. On behalf of AARP-Vermont. Issues: net economic benefits of proposed natural gas transmission project.

59. Expert Testimony. File No. ER-2014-0370 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of Kansas City Power & Light Company for Authority Implement A General Rate Increase for Electric Service.* On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, class cost of service, and policy and ratemaking considerations in connection with electric vehicle charging stations.
60. Expert Testimony. File No. ER-2014-0351 (2015). Before the Public Service Commission of the State of Missouri. *In the Matter of The Empire District Electric Company for Authority To File Tariffs Increasing Rates for Electric Service Provided to Customers In the Company's Missouri Service Area.* On behalf of the Missouri Office of the People's Counsel. Issues: customer charges, rate design, revenue distribution, and class cost of service.
61. Expert Testimony. D.P.U. 14-130 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for approval by the Department of Public Utilities of the Company's 2015 Gas System Enhancement Program Plan, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
62. Expert Testimony. D.P.U. 14-131 (2015). Before the Massachusetts Department of Public Utilities. *Petition of The Berkshire Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
63. Expert Testimony. D.P.U. 14-132 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for approval by the Department of Public Utilities of the Companies' Gas System Enhancement Program for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
64. Expert Testimony. D.P.U. 14-133 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Liberty Utilities for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
65. Expert Testimony. D.P.U. 14-134 (2015). Before the Massachusetts Department of Public Utilities. *Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for*

- approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
66. Expert Testimony. D.P.U. 14-135 (2015). Before the Massachusetts Department of Public Utilities. *Petition of NSTAR Gas Company for approval by the Department of Public Utilities of the Company's Gas System Enhancement Program Plan for 2015, pursuant to G.L. c. 164, § 145, and for rates to be effective May 1, 2015.* On behalf of the Attorney General's Office. Issues: ratepayer protections, cost allocations, rate design, performance metrics.
 67. Expert Report. Docket No. X-33192 (2015). Before the Louisiana Public Service Commission. *Examination of the Comprehensive Costs and Benefits of Net Metering in Louisiana.* On behalf of the Louisiana Public Service Commission. Issues: cost-benefit, cost of service, rate impact.
 68. Expert Testimony. F.C. 1119 (2014). Before the District of Columbia Public Service Commission. *In the Matter of the Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC, and new Special Purpose Entity, LLC.* On behalf of the Office of the People's Counsel. Issues: economic impact analysis, reliability, consumer investment fund, regulatory oversight, impacts to competitive electricity markets.
 69. Expert Report. Civil Action 1:08-cv-0046 (2014). Before the U.S. District Court for the Southern District of Ohio. *Anthony Williams, et al., v. Duke Energy International, Inc., et al.* On behalf of Markovits, Stock & DeMarco, Attorneys & Counselors at Law. Issues: public utility regulation, electric power markets, economic harm.
 70. Expert Testimony. D.P.U. 14-64 (2014). Before the Massachusetts Department of Public Utilities. *NSTAR Gas Company/HOPCO Gas Services Agreement. On behalf of the Office of the Public Advocate.* Issues: certain ratemaking features associated with the proposed Gas Service Agreement.
 71. Expert Testimony. Docket Nos. 14-0224 and 14-0225 (2014). Before the Illinois Commerce Commission. *In the Matter of the Peoples Gas Light and Coke Company and North Shore Gas Company Proposed General Increase in Rates for Gas Service (consolidated).* On behalf of the People of the State of Illinois. Issues: test year expenses, cost benchmarking analysis, pipeline replacement, and leak rate comparisons.
 72. Expert Testimony. Docket 8191 (2014). Before the Vermont Public Service Board. *In Re: Petition of Green Mountain Power Corporation for Approval of a Successor Alternative Regulation Plan.* On the behalf of AARP-Vermont. Issues: Alternative Regulation.
 73. Expert Testimony. Docket No. 2013-00168 (2014). Before the Maine Public Utilities Commission. *In the Matter of the Request for Approval of an Alternative Rate Plan (ARP 2014) Pertaining to Central Maine Power Company.* On behalf of the Office of the Public Advocate. Issues: class cost of service study, marginal cost of service study, revenue distribution and rate design.

74. Expert Testimony. D.P.U. 13-90 (2013). Before the Massachusetts Department of Public Utilities. *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges and increase in base distribution rates for electric service.* On behalf of the Office of the Ratepayer Advocate. Issues: capital cost adjustment mechanism and performance-based regulation.
75. Expert Testimony. BPU Docket Nos. EO13020155 and GO13020156. (2013). Before the State of New Jersey Board of Public Utilities. *I/M/O The Petition of Public Service Electric & Gas Company for the Approval of the Energy Strong Program.* On behalf of the Division of Rate Counsel. Issues: economic impact, infrastructure replacement program rider, pipeline replacement, leak rate comparisons and cost benefit analysis.
76. Expert Testimony. D.P.U. 13-75 (2013). Before the Massachusetts Department of Public Utilities. *Investigation by the Department of Public Utilities on its Own Motion as to the Propriety of the Rates and Charges by Bay State Gas Company d/b/a Columbia Gas of Massachusetts set forth in Tariffs M.D.P.U. Nos. 140 through 173, and Approval of an Increase in Base Distribution Rates for Gas Service Pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq., filed with the Department on April 16, 2013, to be effective May 1, 2013.* On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement, and leak rate comparisons; environmental benefits analysis; O&M offset; and cost benchmarking analysis.
77. Expert Testimony. Docket No. 13-115 (2013). Before the Delaware Public Service Commission. *In the Matter of the Application of Delmarva Power & Light Company FOR an Increase in Electric Base Rates and Miscellaneous Tariff Changes* (Filed March 22, 2013). On the Behalf of Division of the Public Advocate. Issues: pro forma infrastructure proposal, class cost of service study, revenue distribution, and rate design.
78. Expert Testimony. Formal Case No. 1103 (2013). Before the Public Service Commission of the District of Columbia. *In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service.* On the Behalf of the Office of the People's Counsel of the District of Columbia. Issues: Pro forma adjustment for reliability investments.
79. Expert Testimony. Case No. 9326 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Baltimore Gas and Electric Company for Adjustments to its Electric and Gas Base Rates.* On the Behalf of the Maryland Office of the People's Counsel. Issues: Electric Reliability Investment ("ERI") initiatives, pro forma gas infrastructure proposal, tracker mechanisms, class cost of service study, revenue distribution, and rate design
80. Rulemaking Testimony. (2013). Before the Louisiana Tax Commission. Examination of Louisiana Assessors' Association Well Diameter Analysis, economic development policies regarding midstream assets and industrial development.
81. Expert Testimony. Case No. 9317 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Delmarva Power & Light Company for*

- Adjustments to its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.
82. Expert Testimony. Case No. 9311 (2013). Before the Public Service Commission of Maryland. *In the Matter of the Application of Potomac Electric Power Company for an Increase in its Retail Rates for the Distribution of Electric Energy*. Direct, and Surrebuttal. On the Behalf of the Maryland Office of the People's Counsel. Issues: Grid Resiliency Charge, tracker mechanisms, pipeline replacement, class cost of service study, revenue distribution, and rate design.
83. Expert Testimony. Docket No. 12AL-1268G (2013). Before the Public Utilities Commission of the State of Colorado. *In the Matter of the Tariff Sheets Filed by Public Service Company of Colorado with Advice No. 830 – Gas. Answer*. On the Behalf of the Colorado Office of Consumer Counsel. Issues: Pipeline System Integrity Adjustment, tracker mechanisms, pipeline replacement and leak rate comparisons.
84. Expert Testimony. BPU Docket No. EO12080721 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Public Service Electric & Gas Company for Approval of an Extension of Solar Generation Program*. On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal, Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design and net economic benefits.
85. Expert Testimony. BPU Docket No. EO12080726 (2013). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Loan III Program*. On the Behalf of the New Jersey Division of Rate Counsel. Direct, Rebuttal and Surrebuttal. Issues: solar energy market design, solar energy market conditions, solar energy program design.
86. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. December 17, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.
87. Expert Testimony. D.P.U. 12-25. (2012). Before the Massachusetts Department of Public Utilities. *In the Matter of Bay State Gas Company d/b/a/ Columbia Gas Company of Massachusetts Request for Increase in Rates*. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Target infrastructure replacement program rider, pipeline replacement and leak rate comparisons.
88. Expert Testimony. Docket Nos. UE-120436, et.al. (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue Decoupling, lost revenues, tracker mechanisms, attrition adjustments.

89. Expert Testimony. Case No. 9286. (2012) Before the Public Service Commission of Maryland. *In Re: Potomac Electric Power Company ("Pepco") General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.
90. Expert Testimony. Case No 9285. (2012) Before the Public Service Commission of Maryland. *In Re: the Delmarva Power and Light Company General Rate Case*. On the Behalf of the Maryland Office of the People's Counsel. Issues: Capital tracker mechanisms/reliability investment mechanisms, reliability issues, regulatory lag, class cost of service, revenue distribution, rate design.
91. Expert Testimony. Docket Nos. UE-110876 and UG-110877 (consolidated). (2012). Before the Washington Utilities and Transportation Commission. *Washington Utilities and Transportation Commission v. Avista Corporation D/B/A Avista Utilities*. On the Behalf of the Washington Attorney General, Office of the Public Counsel. Issues: Revenue Decoupling, lost revenues, tracker mechanisms.
92. Expert Testimony. BPU Docket No. EO11050314V. (2012). Before the New Jersey Board of Public Utilities. *In the Matter of the Petition of Fishermen's Atlantic City Windfarm, LLC for the Approval of the State Waters Project and Authorizing Offshore Wind Renewable Energy Certificates*. On the Behalf of the New Jersey Division of Rate Counsel. February 3, 2012. Issues: approval of offshore wind project and ratepayer financial support for the proposed project.
93. Expert Testimony. Docket No. NG 0067. (2012). Before the Public Service Commission of Nebraska. *In the Matter of the Application of SourceGas Distribution, LLC Approval of a General Rate Increase*. On the Behalf of the Public Advocate. January 31, 2012. Issues: Revenue Decoupling, Customer Adjustments, Weather Normalization Adjustments, Class Cost of Service Study, Rate Design.
94. Expert Testimony. Docket No. G-04204A-11-0158. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In the Matter of the Application of UNS Gas, Inc. for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of Its Arizona Properties*. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.
95. Expert Testimony. Formal Case Number 1087. (2011). Before the Public Service Commission of the District of Columbia. On the Behalf of the Office of the People's Counsel of the District of Columbia. *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*. Issues: Regulatory lag, ratemaking principles, reliability-related capital expenditure tracker proposals.
96. Expert Affidavit. Case No. 11-1364. (2011). *The State of Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission v. United States Environmental Protection Agency and Lisa P. Jackson*. Before the United States Court of Appeals for the District of Columbia Circuit. On the behalf of the State of

- Louisiana, the Louisiana Department of Environmental Quality, and the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.
97. Expert Affidavit. Docket No. EPA-HQ-OAR-2009-0491. (2011). Before the U.S. Environmental Protection Agency. *Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals*. On the Behalf of the Louisiana Public Service Commission. Issues: Impacts of environmental costs on electric utilities, compliance requirements, investment cost of mitigation equipment, multi-area dispatch modeling and plant retirements.
 98. Expert Testimony. Case No. 9296. (2011). Before the Maryland Public Service Commission. *On the Behalf of the Maryland Office of People's Counsel. In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges and Revise its Terms and Conditions for Gas Service*. Issues: Infrastructure Cost Recovery Rider; Class Cost of Service Modeling; Revenue Distribution; Rate Design.
 99. Expert Testimony. Docket No. G-01551A-10-0458. (2011). Before the Arizona Corporation Commission. On the Behalf of the Arizona Corporation Commission Staff. *In the Matter of the Application of Southwest Gas Corporation for the Establishment of Just and Reasonable Rates and Charges Designed to Realize A Reasonable Rate of Return on the Fair Value of its Properties throughout Arizona*. Issues: Revenue Decoupling; Class Cost of Service Modeling; Revenue Distribution; Rate Design.
 100. Expert Testimony. Docket No. 11-0280 and 11-0281. (2011). Before the Illinois Commerce Commission. On the Behalf of the Illinois Attorney General, the Citizens Utility Board, and the City of Chicago, Illinois. *In re: Peoples Gas Light and Coke Company and North Shore Natural Gas Company*. Issues: Revenue Decoupling and Rate Design. (Direct and Rebuttal)
 101. Expert Testimony. D.P.U. 11-01. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Electric Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Capital Cost Rider, Revenue Decoupling.
 102. Expert Testimony. D.P.U. 11-02. (2011). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. *Petition of the Fitchburg Electric and Gas Company (Gas Division) for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism*. Issues: Pipeline Replacement Rider, Revenue Decoupling.
 103. Expert Affidavit. Docket No. EL-11-13 (2011). Before the Federal Energy Regulatory Commission. *Petition for Preliminary Ruling, Atlantic Grid Operations*. On the Behalf of the New Jersey Division of Rate Counsel. Issues: Offshore wind generation development, offshore wind transmission development, ratemaking treatment of development costs, transmission development incentives.

104. Expert Opinion. Case No. CI06-195. (2011). Before the District Court of Jefferson County, Nebraska. On the Behalf of the City of Fairbury, Nebraska and Michael Beachler. In re: Endicott Clay Products Co. vs. City of Fairbury, Nebraska and Michael Beachler. Issues: rate design and ratemaking, time of use and time differentiated rate structures, empirical analysis of demand and usage trends for tariff eligibility requirements.
105. Expert Testimony. D.P.U. 10-114. (2010). Before the Massachusetts Department of Public Utilities. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Petition of the New England Gas Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. Issues: infrastructure replacement rider.
106. Expert Testimony. D.P.U. 10-70. (2010). Before the Massachusetts Department of Public Utilities. Petition of the Western Massachusetts Electric Company for Approval of A General Increase in Electric Distribution Rates and Approval of a Revenue Decoupling Mechanism. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure replacement rider; performance-based regulation; inflation adjustment mechanisms; and rate design.
107. Expert Testimony. G.U.D. Nos. 998 & 9992. (2010). Before the Texas Railroad Commission. In the Matter of the Rate Case Petition of Texas Gas Services, Inc. On the Behalf of the City of El Paso, Texas. Issues: Cost of service, revenue distribution, rate design, and weather normalization.
108. Expert Testimony. B.P.U Docket No. GR10030225. (2010). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of New Jersey Natural Gas Company for Approval of Regional Greenhouse Gas Initiative Programs and Associated Cost Recovery Mechanisms Pursuant to N.J.S.A. 48:3-98.1. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy proposals, solar securitization issues, solar energy policy issues.
109. Expert Testimony. D.P.U. 10-55. (2010). Before the Massachusetts Department of Public Utilities. Investigation Into the Propriety of Proposed Tariff Changes for Boston Gas Company, Essex Gas Company, and Colonial Gas Company. (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; pipeline-replacement rider; performance-based regulation; partial productivity factor estimates, inflation adjustment mechanisms; and rate design.
110. Expert Testimony. Cause No.43839. (2010). Before the Indiana Utility Regulatory Commission. In the Matter of Southern Indiana Gas and Electric Company d/b/a/ Vectren Energy Delivery of Indiana, Inc. (Vectren South-Electric). On the behalf of the Indiana Office of Utility Consumer Counselor (OUCC). Issues: revenue decoupling, variable production cost riders, gains on off-system sales, transmission cost riders.
111. Congressional Testimony. Before the United States Congress. (2010). U.S. House of Representatives, Committee on Natural Resources. Hearing on the Consolidated Land, Energy, and Aquatic Resources Act. June 30, 2010.
112. Expert Testimony. Before the City Counsel of El Paso, Texas; Public Utility Regulatory

- Board. (2010). On the Behalf of the City of El Paso. In Re: Rate Application of Texas Gas Services, Inc. Issues: class cost of service study (minimum system and zero intercept analysis), rate design proposals, weather normalization adjustment, and its cost of service adjustment clause, conservation adjustment clause proposals, and other cost tracker policy issues.
113. Expert Testimony. Docket 09-00183. (2010). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Chattanooga Gas Company for a General Rate Increase, Implementation of the EnergySMART Conservation Programs, and Implementation of a Revenue Decoupling Mechanism. On the Behalf of Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling and energy efficiency program review and cost effectiveness analysis.
 114. Expert Testimony and Exhibits. Docket No. 10-240. (2010). Before the Louisiana Office of Conservation. In Re: Cadeville Gas Storage, LLC. On the Behalf of Cardinal Gas Storage, LLC. Issues: alternative uses and relative economic benefits of conversion of depleted hydrocarbon reservoir for natural gas storage purposes.
 115. Expert Testimony. Docket No. 09505-EI. (2010). Before the Florida Public Service Commission. In Re: Review of Replacement Fuel Costs Associated with the February 26, 2008 outage on Florida Power & Light's Electrical System. On the Behalf of the Florida Office of Public Counsel for the Citizens of the State of Florida. Issues: Replacement costs for power outage, regulatory policy/generation development incentives, renewable and energy efficiency incentives.
 116. Expert Testimony. Docket 09-00104. (2009). Before the Tennessee Regulatory Authority. In the Matter of the Petition of Piedmont Natural Gas Company, Inc. to Implement a Margin Decoupling Tracker Rider and Related Energy Efficiency and Conservation Programs. On the Behalf of the Tennessee Attorney General, Consumer Advocate & Protection Division. Issues: revenue decoupling, energy efficiency program review, weather normalization.
 117. Expert Testimony. Docket Number NG-0060. (2009). Before the Nebraska Public Service Commission. In the Matter of SourceGas Distribution, LLC Approval for a General Rate Increase. On the Behalf of the Nebraska Public Advocate. October 29, 2009. Issues: revenue decoupling, inflation trackers, infrastructure replacement riders, customer adjustment rider, weather normalization rider, weather normalization adjustments, estimation of normal weather for ratemaking purposes.
 118. Expert Report and Deposition. Before the 23rd Judicial District Court, Parish of Assumption, State of Louisiana. On the Behalf of Dow Hydrocarbons and Resources, Inc. September 1, 2009. (Deposition, November 23-24, 2009). Issues: replacement and repair costs for underground salt cavern hydrocarbon storage.
 119. Expert Testimony. D.P.U. 09-39. Before the Massachusetts Department of Public Utilities. (2009). Investigation Into the Propriety of Proposed Tariff Changes for Massachusetts Electric Company and Nantucket Electric Company (d./b./a. National Grid). On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; infrastructure rider; performance-based regulation; inflation adjustment mechanisms; revenue distribution; and rate design.

120. Expert Testimony. D.P.U. 09-30. Before the Massachusetts Department of Public Utilities. (2009). In the Matter of Bay State Gas Company Request for Increase in Rates. On the Behalf of the Office of the Attorney General, Office of Ratepayer Advocacy. Issues: Revenue decoupling; target infrastructure replacement program rider; revenue distribution; and rate design.
121. Expert Testimony. Docket EO09030249. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric and Gas Company for Approval of a Solar Loan II Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design, renewable portfolio standards, solar energy, and renewable financing/loan program design.
122. Expert Testimony. Docket EO0920097. (2009). Before the New Jersey Board of Public Utilities. In the Matter of the Verified Petition of Rockland Electric Company for Approval of an SREC-Based Financing Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: solar energy market design; renewable energy portfolio standards; solar energy.
123. Expert Rebuttal Report. Civil Action No.: 2:07-CV-2165. (2009). Before the U.S. District Court, Western Division of Louisiana, Lake Charles Division. Prepared on the Behalf of the Transcontinental Pipeline Corporation. Issues: expropriation and industrial use of property.
124. Expert Testimony. Docket EO06100744. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Atlantic City Electric Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)
125. Expert Testimony. Docket EO08090840. (2008). Before the New Jersey Board of Public Utilities. In the Matter of the Renewable Portfolio Standard – Amendments to the Minimum filing Requirements for Energy Efficiency, Renewable Energy, and Conservation Programs and For Electric Distribution Company Submittals of Filings in connection with Solar Financing (Jersey Central Power & Light Company). On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: Solar energy market design; renewable energy portfolio standards; solar energy. (Rebuttal and Surrebuttal)
126. Expert Testimony. Docket UG-080546. (2008). Before the Washington Utilities and Transportation Commission. On the Behalf of the Washington Attorney General (Public Counsel Section). Issues: Rate Design, Cost of Service, Revenue Decoupling, Weather Normalization.
127. Congressional Testimony. (2008). Senate Republican Conference: Panel on Offshore Drilling in the Restricted Areas of the Outer Continental Shelf. September 18, 2008.

128. Expert Testimony. Appeal Number 2007-125 and 2007-299. (2008). Before the Louisiana Tax Commission. On the Behalf of Jefferson Island Storage and Hub, LLC (AGL Resources). Issues: Valuation Methodologies, Underground Storage Valuation, LTC Guidelines and Policies, Public Purpose of Natural Gas Storage. July 15, 2008 and August 20, 2008.
129. Expert Testimony. Docket Number 07-057-13. (2008). Before the Utah Public Service Commission. In the Matter of the Application of Questar Gas Company to File a General Rate Case. On the Behalf of the Utah Committee of Consumer Services. Issues: Cost of Service, Rate Design. August 18, 2008 (Direct, Rebuttal, Surrebuttal).
130. Rulemaking Testimony. (2008). Before the Louisiana Tax Commission. Examination of Replacement Cost Tables, Depreciation and Useful Lives for Oil and Gas Properties. Chapter 9 (Oil and Gas Properties) Section. August 5, 2008.
131. Legislative Testimony. (2008). Examination of Proposal to Change Offshore Natural Gas Severance Taxes (HB 326 and Amendments). Joint Finance and Appropriations Committee of the Alabama Legislature. March 13, 2008.
132. Public Testimony. (2007). Issues in Environmental Regulation. Testimony before Gubernatorial Transition Committee on Environmental Regulation (Governor-Elect Bobby Jindal). December 17, 2007.
133. Public Testimony. (2007). Trends and Issues in Alternative Energy: Opportunities for Louisiana. Testimony before Gubernatorial Transition Committee on Natural Resources (Governor-Elect Bobby Jindal). December 13, 2007.
134. Expert Report and Recommendation: Docket Number S-30336 (2007). Before the Louisiana Public Service Commission. In re: Entergy Gulf States, Inc. Application for Approval of Advanced Metering Pilot Program. Issues: pilot program for demand response programs and advanced metering systems.
135. Expert Testimony. Docket EO07040278 (2007). Before the New Jersey Board of Public Utilities. In the Matter of the Petition of Public Service Electric & Gas Company for Approval of a Solar Energy Program and An Associated Cost Recovery Mechanism. On the Behalf of the Department of the Public Advocate, Division of Rate Counsel. Issues: renewable energy market development, solar energy development, SREC markets, rate impact analysis, cost recovery issues.
136. Expert Testimony: Docket Number 05-057-T01 (2007). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Direct, Rebuttal, and Surrebuttal Testimony)
137. Expert Testimony (Non-sworn rulemaking testimony) Docket Number RR-2008, (2007). Before the Louisiana Tax Commission. In re: Commission Consideration of Amendment and/or Adoption of Tax Commission Real/Personal Property Rules and Regulations. Issues: Louisiana oil and natural gas production trends, appropriate cost measures for

- wells and subsurface property, economic lives and production decline curve trends.
138. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29213 & 29213-A, ex parte, (2007). Before the Louisiana Public Service Commission. In re: Investigation to determine if it is appropriate for LPSC jurisdictional electric utilities to provide and install time-based meters and communication devices for each of their customers which enable such customers to participate in time-based pricing rate schedules and other demand response programs. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: demand response programs, advanced meter systems, cost recovery issues, energy efficiency issues, regulatory issues.
 139. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29712, ex parte, (2007) Before the Louisiana Public Service Commission. In re: Investigation into the ratemaking and generation planning implications of nuclear construction in Louisiana. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: nuclear cost power plant development, generation planning issues, and cost recovery issues.
 140. Expert Testimony, Case Number U-14893, (2006). Before the Michigan Public Service Commission. In the Matter of SEMCO Energy Gas Company for Authority to Redesign and Increase Its Rates for the Sale and Transportation of Natural Gas In its MPSC Division and for Other Relief. On the behalf of the Michigan Attorney General. Issues: Rate Design, revenue decoupling, financial analysis, demand-side management program and energy efficiency policy. (Direct and Rebuttal Testimony).
 141. Expert Report, Recommendation, and Proposed Rule: Docket Number R-29380, ex parte, (2006). Before the Louisiana Public Service Commission. In re: An Investigation Into the Ratemaking and Generation Planning Implications of the U.S. EPA Clean Air Interstate Rule. On the behalf of the Louisiana Public Service Commission Staff. Report and Recommendation. Issues: environmental regulation and cost recovery; allowance allocations and air credit markets; ratepayer impacts of new environmental regulations.
 142. Expert Affidavit Before the Louisiana Tax Commission (2006). On behalf of ANR Pipeline, Tennessee Gas Transmission and Southern Natural Gas Company. Issues: Competitive nature of interstate and intrastate transportation services.
 143. Expert Affidavit Before the 19th Judicial District Court (2006). Suit Number 491, 453 Section 26. On behalf of Transcontinental Pipeline Corporation, et.al. Issues: Competitive nature of interstate and intrastate transportation services.
 144. Expert Testimony: Docket Number 05-057-T01 (2006). Before the Utah Public Service Commission. In the Matter of: Joint Application of Questar Gas Company, the Division of Public Utilities, and Utah Clean Energy for Approval of the Conservation Enabling Tariff Adjustment Options and Accounting Orders. On the behalf of the Utah Committee of Consumer Services. Issues: Revenue Decoupling, Demand-side Management; Energy Efficiency policies. (Rebuttal and Supplemental Rebuttal Testimony)
 145. Legislative Testimony (2006). Senate Committee on Natural Resources. Senate Bill 655

Regarding Remediation of Oil and Gas Sites, Legacy Lawsuits, and the Deterioration of State Drilling.

146. Expert Report: Rulemaking Docket (2005). Before the New Jersey Bureau of Public Utilities. In re: Proposed Rulemaking Changes Associated with New Jersey's Renewable Portfolio Standard. Expert Report. The Economic Impacts of New Jersey's Proposed Renewable Portfolio Standard. On behalf of the New Jersey Office of Ratepayer Advocate. Issues: Renewable Portfolio Standards, rate impacts, economic impacts, technology cost forecasts.
147. Expert Testimony: Docket Number 2005-191-E. (2005). Before the South Carolina Public Service Commission. On behalf of NewSouth Energy LLC. In re: General Investigation Examining the Development of RFP Rules for Electric Utilities. Issues: Competitive bidding; merchant development. (Direct and Rebuttal Testimony).
148. Expert Testimony: Docket No. 05-UA-323. (2005). Before the Mississippi Public Service Commission. On the behalf of Calpine Corporation. In re: Entergy Mississippi's Proposed Acquisition of the Attala Generation Facility. Issues: Asset acquisition; merchant power development; competitive bidding.
149. Expert Testimony: Docket Number 050045-EI and 050188-EI. (2005). Before the Florida Public Service Commission. On the behalf of the Citizens of the State of Florida. In re: Petition for Rate Increase by Florida Power & Light Company. Issues: Load forecasting; O&M forecasting and benchmarking; incentive returns/regulation.
150. Expert Testimony (non-sworn, rulemaking): Comments on Decreased Drilling Activities in Louisiana and the Role of Incentives. (2005). Louisiana Mineral Board Monthly Docket and Lease Sale. July 13, 2005
151. Legislative Testimony (2005). Background and Impact of LNG Facilities on Louisiana. Joint Meeting of Senate and House Natural Resources Committee. Louisiana Legislature. May 19, 2005.
152. Public Testimony. Docket No. U-21453. (2005). Technical Conference before the Louisiana Public Service Commission on an Investigation for a Limited Industrial Retail Choice Plan.
153. Expert Testimony: Docket No. 2003-K-1876. (2005). On Behalf of Columbia Gas Transmission. Expert Testimony on the Competitive Market Structure for Gas Transportation Service in Ohio. Before the Ohio Board of Tax Appeals.
154. Expert Report and Testimony: Docket No. 99-4490-J, *Lafayette City-Parish Consolidated Government, et. al. v. Entergy Gulf States Utilities, Inc. et. al.* (2005, 2006). On behalf of the City of Lafayette, Louisiana and the Lafayette Utilities Services. Expert Rebuttal Report of the Harborfront Consulting Group Valuation Analysis of the LUS Expropriation. Filed before 15th Judicial District Court, Lafayette, Louisiana.
155. Expert Testimony: ANR Pipeline Company v. Louisiana Tax Commission (2005), Number 468,417 Section 22, 19th Judicial District Court, Parish of East Baton Rouge, State of Louisiana Consolidated with Docket Numbers: 480,159; 489,776;480,160; 480,161;

- 480,162; 480,163; 480,373; 489,776; 489,777; 489,778;489,779; 489,780; 489,803; 491,530; 491,744; 491,745; 491,746; 491,912;503,466; 503,468; 503,469; 503,470; 515,414; 515,415; and 515,416. In re: Market structure issues and competitive implications of tax differentials and valuation methods in natural gas transportation markets for interstate and intrastate pipelines.
156. Expert Report and Recommendation: Docket No. U-27159. (2004). On Behalf of the Louisiana Public Service Commission Staff. Expert Report on Overcharges Assessed by Network Operator Services, Inc. Before the Louisiana Public Service Commission.
 157. Expert Testimony: Docket Number 2004-178-E. (2004). Before the South Carolina Public Service Commission. On behalf of Columbia Energy LLC. In re: Rate Increase Request of South Carolina Electric and Gas. (Direct and Surrebuttal Testimony)
 158. Expert Testimony: Docket Number 040001-EI. (2004). Before the Florida Public Service Commission. On behalf of Power Manufacturing Systems LLC, Thomas K. Churbuck, and the Florida Industrial Power Users Group. In re: Fuel Adjustment Proceedings; Request for Approval of New Purchase Power Agreements. Company examined: Florida Power & Light Company.
 159. Expert Affidavit: Docket Number 27363. (2004). Before the Public Utilities Commission of Texas. Joint Affidavit on Behalf of the Cities of Texas and the Staff of the Public Utilities Commission of Texas Regarding Certified Issues. In Re: Application of Valor Telecommunications, L.P. For Authority to Establish Extended Local Calling Service (ELCS) Surcharges For Recovery of ELCS Surcharge.
 160. Expert Report and Testimony. Docket 1997-4665-PV, 1998-4206-PV, 1999-7380-PV, 2000-5958-PV, 2001-6039-PV, 2002-64680-PV, 2003-6231-PV. (2003) Before the Kansas Board of Tax Appeals. (2003). In the Matter of the Appeals of CIG Field Services Company from orders of the Division of Property Valuation. On the Behalf of CIG Field Services. Issues: the competitive nature of natural gas gathering in Kansas.
 161. Expert Report and Testimony: Docket Number U-22407. Before the Louisiana Public Service Commission (2002). On the Behalf of the Louisiana Public Service Commission Staff. Company examined: Louisiana Gas Services, Inc. Issues: Purchased Gas Acquisition audit, fuel procurement and planning practices.
 162. Expert Testimony: Docket Number 000824-EI. Before the Florida Public Service Commission. (2002). On the Behalf of the Citizens of the State of Florida. Company examined: Florida Power Corporation. Issues: Load Forecasts and Billing Determinants for the Projected Test Year.
 163. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic Impacts of Merchant Power Generation.
 164. Expert Testimony: Docket Number 24468. (2001). On the Behalf of the Texas Office of Public Utility Counsel. Public Utility Commission of Texas Staff's Petition to Determine Readiness for Retail Competition in the Portion of Texas Within the Southwest Power Pool. Company examined: AEP-SWEPCO.

165. Expert Report. (2001) On Behalf of David Liou and Pacific Richland Products, Inc. to Review Cogeneration Issues Associated with Dupont Dow Elastomers, L.L.C. (DDE) and the Dow Chemical Company (Dow).
166. Expert Testimony: Docket Number 01-1049, Docket Number 01-3001. (2001) On behalf the Nevada Office of Attorney General, Bureau of Consumer Protection. Petition of Central Telephone Company-Nevada D/b/a Sprint of Nevada and Sprint Communications L.P. for Review and Approval of Proposed Revised Performance Measures and Review and Approval of Performance Measurement Incentive Plans. Before the Public Utilities Commission of Nevada.
167. Expert Affidavit: Multiple Dockets (2001). Before the Louisiana Tax Commission. On the Behalf of Louisiana Interstate Pipeline Companies. Testimony on the Competitive Nature of Natural Gas Transportation Services in Louisiana.
168. Expert Affidavit before the Federal District Court, Middle District of Louisiana (2001). Issues: Competitive Nature of the Natural Gas Transportation Market in Louisiana. On behalf of a Consortium of Interstate Natural Gas Transportation Companies.
169. Public Testimony: Louisiana Board of Commerce and Industry (2001). Testimony on the Economic and Ratepayer Benefits of Merchant Power Generation and Issues Associated with Tax Incentives on Merchant Power Generation and Transmission.
170. Expert Testimony: Docket Number 01-1048 (2001). Before the Public Utilities Commission of Nevada. On the Behalf of the Nevada Office of the Attorney General, Bureau of Consumer Protection. Company analyzed: Nevada Bell Telephone Company. Issues: Statistical Issues Associated with Performance Incentive Plans.
171. Expert Testimony: Docket 22351 (2001). Before the Public Utility Commission of Texas. On the Behalf of the City of Amarillo. Company analyzed: Southwestern Public Service Company. Issues: Unbundled cost of service, affiliate transactions, load forecasting.
172. Expert Testimony: Docket 991779-EI (2000). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Competitive Nature of Wholesale Markets, Regional Power Markets, and Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.
173. Expert Testimony: Docket 990001-EI (1999). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Regulatory Treatment of Incentive Returns on Gains from Economic Energy Sales.
174. Expert Testimony: Docket 950495-WS (1996). Before the Florida Public Service Commission. On the Behalf of the Citizens of the State of Florida. Company analyzed: Southern States Utilities, Inc. Issues: Revenue Repression Adjustment, Residential and Commercial Demand for Water Service.

175. Legislative Testimony. Louisiana House of Representatives, Special Subcommittee on Utility Deregulation. (1997). On Behalf of the Louisiana Public Service Commission Staff. Issue: Electric Restructuring.
176. Expert Testimony: Docket 940448-EG -- 940551-EG (1994). Before the Florida Public Service Commission. On the Behalf of the Legal Environmental Assistance Foundation. Companies analyzed: Florida Power & Light Company; Florida Power Corporation; Tampa Electric Company; and Gulf Power Company. Issues: Comparison of Forecasted Cost-Effective Conservation Potentials for Florida.
177. Expert Testimony: Docket 920260-TL, (1993). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: BellSouth Communications, Inc. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.
178. Expert Testimony: Docket 920188-TL, (1992). Before the Florida Public Service Commission. On the Behalf of the Florida Public Service Commission Staff. Company analyzed: GTE-Florida. Issues: Telephone Demand Forecasts and Empirical Estimates of the Price Elasticity of Demand for Telecommunication Services.

REFEREE AND EDITORIAL APPOINTMENTS

Contributor, 2014-2018, *Wall Street Journal*, *Journal Reports*, *Energy*

Editorial Board Member, 2015-2017, *Utilities Policy*

Referee, 2014-Current, *Utilities Policy*

Referee, 2010-Current, *Economics of Energy & Environmental Policy*

Referee, 1995-Current, *Energy Journal*

Contributing Editor, 2000-2005, *Oil, Gas and Energy Quarterly*

Referee, 2005, *Energy Policy*

Referee, 2004, *Southern Economic Journal*

Referee, 2002, *Resource & Energy Economics*

Committee Member, IAEE/USAEE Student Paper Scholarship Award Committee, 2003

PROPOSAL TECHNICAL REVIEWER

California Energy Commission, Public Interest Energy Research (PIER) Program (1999).

PROFESSIONAL ASSOCIATIONS

American Economic Association, American Statistical Association, Southern Economic Association, Western Economic Association, International Association of Energy Economists ("IAEE"), United States Association of Energy Economics ("USAEE"), the National Association for Business Economics ("NABE"), and the Energy Bar Association (National and Louisiana Chapter;

current Board member of LA chapter).

HONORS AND AWARDS

National Association of Regulatory Utility Commissioners (NARUC). Best Paper Award for papers published in the *Journal of Applied Regulation* (2004).

Baton Rouge Business Report, Selected as "Top 40 Under 40" (2003).

Omicron Delta Epsilon (1992-Current).

Interstate Oil and Gas Compact Commission (IOGCC) "Best Practice" Award for Research on the Economic Impact of Oil and Gas Activities on State Leases for the Louisiana Department of Natural Resources (2003).

Distinguished Research Award, Academy of Legal, Ethical and Regulatory Issues, Allied Academics (2002).

Florida Public Service Commission, Staff Excellence Award for Assistance in the Analysis of Local Exchange Competition Legislation (1995).

TEACHING EXPERIENCE

Energy and the Environment (Survey Course)

Principles of Microeconomic Theory

Principles of Macroeconomic Theory

Lecturer, Environmental Management and Permitting. Lecture in Natural Gas Industry, LNG and Markets.

Lecturer, Electric Power Industry Environmental Issues, Field Course on Energy and the Environment. (Dept. of Environmental Studies).

Lecturer, Electric Power Industry Trends, Principles Course in Power Engineering (Dept. of Electric Engineering).

Lecturer, LSU Honors College, Senior Course on "Society and the Coast."

Continuing Education. Electric Power Industry Restructuring for Energy Professionals.

"The Gulf Coast Energy Situation: Outlook for Production and Consumption." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, New Orleans, LA, December 2, 2004

"The Impact of Hurricane Katrina on Louisiana's Energy Infrastructure and National Energy Markets." Educational Course and Lecture Prepared for the Foundation for American Communications and the Society for Professional Journalists, Houston, TX, September 13, 2005.

"Forecasting for Regulators: Current Issues and Trends in the Use of Forecasts, Statistical, and Empirical Analyses in Energy Regulation." Instructional Course for State Regulatory Commission Staff. Institute of Public Utilities, Kellogg Center, Michigan State University. July 8-9, 2010.

“Regulatory and Ratemaking Issues with Cost and Revenue Trackers.” Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 29, 2010.

“Demand Modeling and Forecasting for Regulators.” Michigan State University, Institute of Public Utilities. Advanced Regulatory Studies Program. September 30, 2010.

“Demand Modeling and Forecasting for Regulators.” Michigan State University, Institute of Public Utilities, Forecasting Workshop, Charleston, SC. March 7-9, 2011.

“Regulatory and Cost Recovery Approaches for Smart Grid Applications.” Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 7-11, 2011.

“Regulatory and Ratemaking Issues Associated with Cost and Expense Adjustment Mechanisms.” Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 28, 2011.

“Utility Incentives, Decoupling, and Renewable Energy Programs.” Michigan State University, Institute of Public Utilities, Advanced Regulatory Studies Program. Lansing, Michigan. September 29, 2011.

“Regulatory and Cost Recovery Approaches for Smart Grid Applications.” Michigan State University, Institute of Public Utilities, Smart Grid Workshop for Regulators. Charleston, SC. March 6-8, 2012.

“Traditional and Incentive Ratemaking Workshop.” New Mexico Public Utilities Commission Staff. Santa Fe, NM October 18, 2012.

“Traditional and Incentive Ratemaking Workshop.” New Jersey Board of Public Utilities Staff. Newark, NJ. March 1, 2013.

“Natural Gas Issues and Recent Market Trends.” Michigan State University Institute of Public Utilities, GridSchool Regulatory Studies Program, East Lansing, Mich., March 29, 2017.

“Gas Supply Planning and Procurement: Regulatory Overview and issues.” Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 17, 2017.

“Natural Gas Supply Issues and Challenges.” Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 17, 2017.

“Incentives, Risk and Changes in the Nature of Regulation.” Michigan State University Institute of Public Utilities, Basic Regulatory Studies Program, East Lansing, Mich., Aug 18, 2017.

“Traditional and Alternative Forms of Regulation: Background and Overview.” Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

“Traditional and Alternative Forms of Regulation: Utility and policy motivations for risk and change.” Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

“Traditional and Alternative Forms of Regulation: Incentives and Formula Based Methods.” Michigan State University Institute of Public Utilities, Advanced Regulatory Studies Program, East Lansing, Mich., October 2, 2017.

THESIS/DISSERTATIONS COMMITTEES

Active:

- 1 Thesis Committee Memberships (Environmental Studies)
- 2 Ph.D. Dissertation Committee (Economics)

Completed:

- 8 Thesis Committee Memberships (Environmental Studies, Geography)
- 4 Doctoral Committee Memberships (Information Systems & Decision Sciences, Agricultural and Resource Economics, Economics, Education and Workforce Development).
- 2 Doctoral Examination Committee Membership (Information Systems & Decision Sciences, Education and Workforce Development)
- 1 Senior Honors Thesis (Journalism, Loyola University)

LSU SERVICE AND COMMITTEE MEMBERSHIPS

Committee Member, Energy Education Curriculum Committee. E.J. Ourso College of Business. LSU (2016-Current).

Chairman, LSU Energy Initiative/LSU Energy Council (2014-Current).

Co-Director & Steering Committee Member, LSU Coastal Marine Institute (2009-2014).

CES Promotion Committee, Division of Radiation Safety (2006).

Search Committee Chair (2006), Research Associate 4 Position.

Search Committee Member (2005), Research Associate 4 Position.

Search Committee Member (2005), CES Communications Manager.

LSU Graduate Research Faculty, Associate Member (1997-2004); Full Member (2004-2010); Affiliate Member with Full Directional Rights (2011-2014); Full Member (2014-current).

LSU Faculty Senate (2003-2006).

Conference Coordinator. (2005-Current) Center for Energy Studies Conference on Alternative Energy.

LSU CES/SCE Public Art Selection Committee (2003-2005).

Conference Coordinator. Center for Energy Studies Annual Energy Conference/Summit. (2003-Current).

Conference Coordinator. Center for Energy Studies Seminar Series on Electric Utility Restructuring and Wholesale Competition. (1996-2003).

Co-Chairman, Review Committee, Louisiana Port Construction and Development Priority Program Rules and Regulations, On Behalf of the LSU Ports and Waterways Institute. (1997).

LSU Main Campus Cogeneration/Turbine Project, (1999-2000).

LSU InterCollege Environmental Cooperative. (1999-2001).

LSU Faculty Senate Committee on Public Relations (1997-1999).

LSU Faculty Senate Committee on Student Retention and Recruitment (1999-2003).

PROFESSIONAL SERVICE

Board Member (2018). Energy Bar Association, Louisiana Chapter.

Program Committee Member (2017). Gulf Coast Power Association Conference. New Orleans, LA.

Program Committee Member (2016). Gulf Coast Power Association Conference. New Orleans, LA.

Program Committee Member (2015). Gulf Coast Power Association Workshop/Special Briefing. "Gulf Coast Disaster Readiness: A Past, Present and Future Look at Power and Industry Readiness in MISO South."

Advisor (2008). National Association of Regulatory Utility Commissioners ("NARUC"). Study Committee on the Impact of Executive Drilling Moratoria on Federal Lands.

Steering Committee Member, Louisiana Representative (2008-Current). Southeast Agriculture & Forestry Energy Resources Alliance. Southern Policies Growth Board.

Advisor (2007-Current). National Association of State Utility Consumer Advocates ("NASUCA"), Natural Gas Committee.

Program Committee Chairman (2007-2008). U.S. Association of Energy Economics ("USAEE") Annual Conference, New Orleans, LA

Finance Committee Chairman (2007-2008). USAEE Annual Conference, New Orleans, LA

Committee Member (2006), International Association for Energy Economics ("IAEE") Nominating Committee.

Founding President (2005-2007) Louisiana Chapter, USAEE.

Secretary (2001) Houston Chapter, USAEE.

Advisor, Louisiana LNG Buyers/Developers Summit, Office of the Governor/Louisiana Department of Economic Development/Louisiana Department of Natural Resources, and Greater New Orleans, Inc. (2004).

Table of Schedules

Witness Dismukes
Docket Nos. QO19010040
and GO20090622

Title	Schedule
Summary of Proposed Program Budgets and CBA Results	Schedule DED-1
NJNG EE and Infrastructure Program Investments: 2009-2019	Schedule DED-2
NJNG and Average New Jersey Natural Gas Distribution Rates	Schedule DED-3
Company's Henry Hub, Tetco M3 and Tetco M3 Basis Prices: 2018-2040	CONFIDENTIAL Schedule DED-4
Partially Corrected NJCT CBRs	Schedule DED-5
Effects of Fine Particulate Emissions (PM2.5)	Schedule DED-6
Volatility Cost Studies Surveyed by the Company	Schedule DED-7

Summary of Proposed Programs and CBA Results

Program	Type of Program	Portfolio Basics				Cost Tests						Annual Expenses				
		Program Budget (\$)	Lifetime Savings (Dth)	Benefit-Cost Ratio (NJCT)	Revenue Req. (\$) (2021-2036)	New Jersey (NJCT)	Societal (SCT)	Total Resource (TRC)	Participant (PCT)	Program Administrator (PAC)	Ratepayer Impact Measure (RIM)	Year 1 Budget	Year 2 Budget	Year 3 Budget (\$)	Total Budget	Average Annual Expenditures
EE Products	Core	\$ 56,768,985	5,104,592	1.5		1.5	4.4	0.9	1.9	1.4	0.8	\$ 17,735,694	\$ 19,144,201	\$ 19,889,090	\$ 56,768,985	\$ 18,922,995
HPwES	Core	29,773,752	1,145,089	1.0		1.0	2.2	0.6	1.7	0.7	0.5	9,323,595	9,994,119	10,456,038	29,773,752	9,924,584
Multi-family	Core	25,542,959	580,406	2.0		2.0	4.3	1.2	2.3	1.5	1.0	7,399,156	8,497,326	9,646,477	25,542,959	8,514,320
Comm & Presc.	Core	23,690,811	1,164,203	4.5		4.5	9.6	2.8	8.5	1.3	0.9	6,983,149	7,801,006	8,906,656	23,690,811	7,896,937
DI	Core	48,911,127	1,510,401	5.6		5.6	11.2	4.0	4.9	3.1	1.4	15,197,998	16,463,881	17,249,248	48,911,127	16,303,709
Core		\$184,687,634	9,504,692	2.5		2.5	5.7	1.6	2.8	1.8	1.0	\$ 56,639,592	\$ 61,900,533	\$ 66,147,509	\$ 184,687,634	\$ 61,562,545
Behavioral	Utility-led	\$ 5,275,086	714,733	1.8		1.8	2.4	1.4	2.9	1.4	0.8	\$ 1,846,158	\$ 1,756,148	\$ 1,672,780	\$ 5,275,086	\$ 1,758,362
QHEC	Utility-led	5,271,145	52,424	0.9		0.9	1.9	0.6	10.2	0.6	0.5	1,806,547	1,708,523	1,756,075	5,271,145	1,757,048
Mod. Inc Weath.	Utility-led	6,948,607	205,061	0.6		0.6	1.2	0.3	1.6	0.3	0.3	2,283,306	2,287,063	2,378,238	6,948,607	2,316,202
Energy Mgmt	Utility-led	3,277,081	41,805	0.6		0.6	1.8	0.4	0.9	0.8	0.6	1,031,917	1,046,717	1,198,447	3,277,081	1,092,360
Eng. Solutions	Utility-led	43,731,495	1,992,652	1.2		1.2	2.4	0.7	1.3	1.0	0.8	13,582,555	14,717,585	15,431,355	43,731,495	14,577,165
Hybrid Heat	Utility-led	5,573,851	303,694	1.2		1.2	8.4	0.6	2.4	0.5	0.4	1,370,059	1,924,043	2,279,749	5,573,851	1,857,950
Utility-led		\$ 70,077,265	3,310,368	1.2		1.2	2.4	0.7	1.5	0.9	0.7	\$ 21,920,542	\$ 23,440,079	\$ 24,716,644	\$ 70,077,265	\$ 23,359,088
Portfolio		\$ 3,468,667	-	-		-	0.5	-	n/a	-	-	\$ 1,404,261	\$ 1,022,704	\$ 1,041,701	\$ 3,468,667	\$ 1,156,222
Portfolio		\$ 3,468,667	-	-		-	0.5	-	n/a	-	-	\$ 1,404,261	\$ 1,022,704	\$ 1,041,701	\$ 3,468,667	\$ 1,156,222
Total		\$258,233,566	12,815,060	2.0	\$228,163,094	2.0	4.8	1.4	2.4	1.6	1.0	\$ 79,964,395	\$ 86,363,316	\$ 91,905,854	\$ 258,233,566	\$ 86,077,855

NJNG EE and Infrastructure Program Investments: 2009-2019

NJNG Program	Start Year	End Year	Requested Investment ---- (million \$) ----	Authorized Investment
Infrastructure Investment				
Accelerated Infrastructure Investment Program ("AIP") I	2009	2011	\$ 70.80	\$ 70.80
Accelerated Infrastructure Investment Program ("AIP") II	2011	2012	\$ 60.15	\$ 60.15
Safety Acceleration and Facility Enhancement Program ("SAFE")	2012	2016	\$ 204.00	\$ 130.00
NJ Reinvestment in System Enhancement ("NJ RISE")	2014	2015	\$ 102.50	\$ 102.50
Safety Acceleration and Facility Enhancement Program ("SAFE") II	2016	2021	\$ 200.00	\$ 200.00
Infrastructure Investment Program ("IIP")	2019	2024	\$ 507.00	\$ 150.00
Total			\$ 1,144.45	\$ 713.45

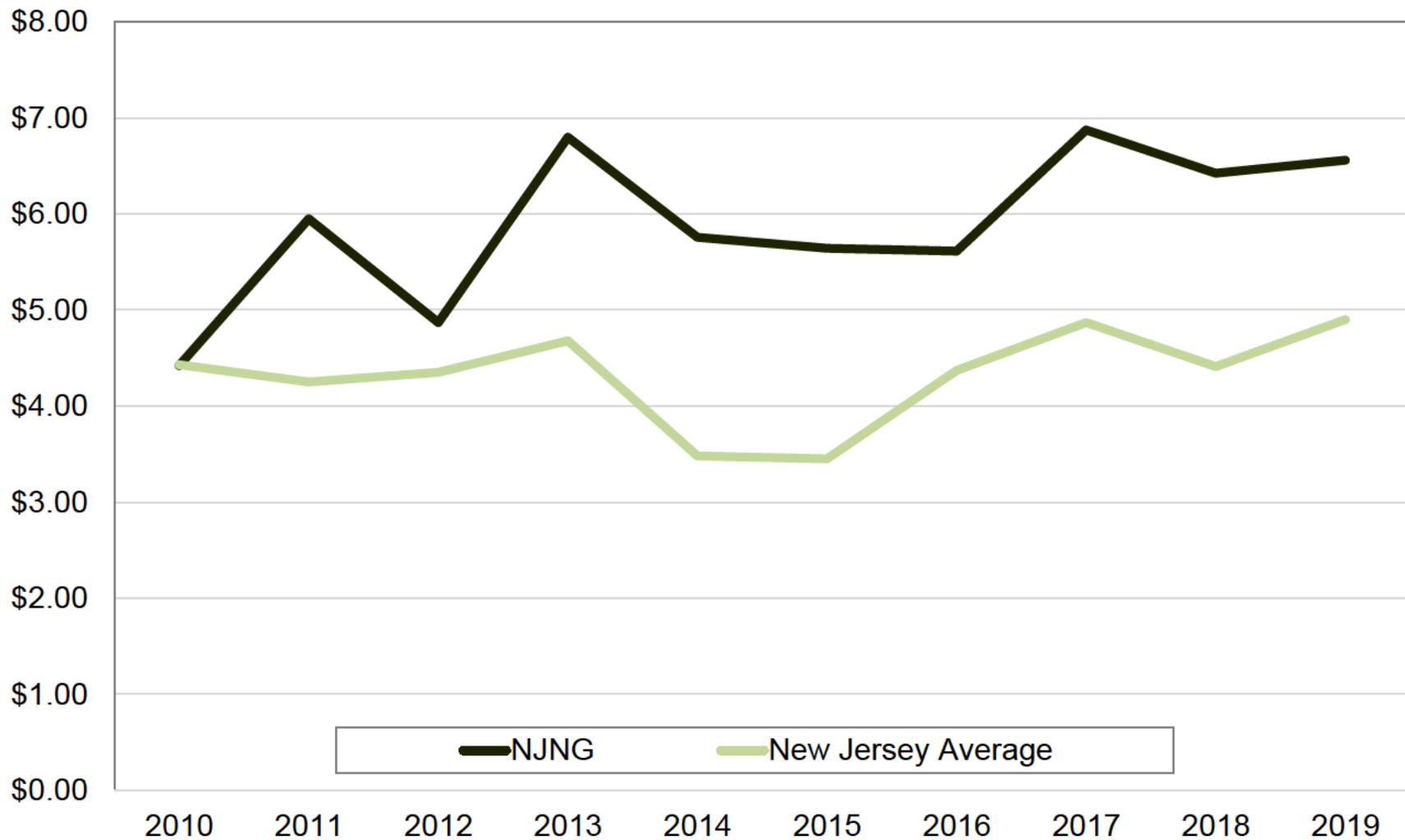
Source: In the Matter of The Proceeding Decision and Order for Infrastructure Investment Approving Stipulation and a Cost Recovery Mechanism for All Gas and Electric Utilities. Docket No. EO09010049; In the Matter of the Petition of New Jersey Natural Gas Company for Approval of an Accelerated Energy Infrastructure Investment Program Pursuant to N.J.S.A. 48:2-23, and for Approval of Necessary Changes to Gas Rate and Changes in the Company's Tariff for Gas Service Pursuant to N.J.S.A. 48:2-21. Docket Nos. GO09010052 and GR07110889. Decision and Order Approving Stipulation. April 16, 2009. In the Matter of the Petition of New Jersey Natural Gas Company for Approval of an Extension of the Accelerated Energy Infrastructure Investment Program Pursuant To N.J.S.A. 48:2-23 and for Approval of Necessary Changes in the Company's Tariff for Gas Service Pursuant To N.J.S.A. 48:2-21 Et Seq. Docket Nos. GR07110889; GR10100793. Decision and Order Approving Stipulation. March 30, 2011; In the Matter of the Petition of New Jersey Natural Gas Company for Approval of the safety Acceleration and Facility Enhancement Program Pursuant to N.J.S.A 48:2-23, and for Approval of the Associated Recovery Mechanism Pursuant to N.J.SA 48:2-21 and N.J.SA 2-21.1. Docket No. GO12030255. Order. October 23, 2012; In the Matter of the Board's Establishment of a Generic Proceeding to Review the Costs, Benefits and Reliability Impacts of Major Storm Event Mitigation Efforts, Docket No. AX13030197; and in the Matter of the Petition of New Jersey Natural Gas Company for Approval of the NJ Rise Program and Associated Rate Recovery Mechanism, Docket No. GR13090828. Decision and Order Approving Stipulation. July 23, 2014; In the Matter of the Petition of New Jersey Natural Gas Company for Approval of an Increase in Gas Base Rates and for Changes in its Tariff for Gas Service, Approval of the SAFE Program Extension, and Approval of SAFE Extension and NJ RISE Rate Recovery Mechanisms Pursuant to N.J.S.A. 48:2-21, 48:2-21.1 and for Changes to Depreciation Rates for Gas Property Pursuant to N.J.S.A. 48:2-18; BPU Docket No. GR15111304 and OAL PUC 00738-16. September 23, 2016; In the Matter of the Petition of New Jersey Natural Gas Company for Approval to Implement an Infrastructure Investment Program ("IIP") and Associated Cost Recovery Mechanism Pursuant to N.J.S.A. 48:2-21 and N.J.A.C. 14:3-2A. Decision and Order Approving Stipulation of Settlement. Docket No. GR19020278. October 28, 2020.

NJNG EE and Infrastructure Program Investments: 2009-2019

Witness Dismukes
Docket Nos. QO19010040
and GO20090622
Schedule DED-2
Page 2 of 2

NJNG Program	Total Budget ---- (million \$) ----	Total Expenditures
Energy Efficiency		
SAVEGREEN 2010 Program	\$ 14.32	\$ 13.20
SAVEGREEN 2012 Program	30.80	28.90
SAVEGREEN 2013 Program	83.70	78.98
SAVEGREEN 2015 Program	85.24	59.90
SAVEGREEN 2018 Program	140.28	30.35
Total Energy Efficiency	\$ 354.33	\$ 211.34

NJNG and Average New Jersey Natural Gas Distribution Rates



Partially Corrected NJCT CBRs

Program	NJNG - New Jersey Cost Test	
	Original Benefit-Cost Ratios	Partially Corrected Benefit-Cost Ratios
Behavioral	1.8	1.6
EE Products	1.5	1.1
HPwES	1.0	0.8
QHEC	0.9	0.8
Mod. Inc Weath.	0.6	0.5
Multi-family	2.0	1.5
Comm & Presc.	4.5	3.8
Energy Mgmt	0.6	0.5
Eng. Solutions	1.2	0.9
DI	5.6	4.6
Hybrid Heat	1.2	0.8
Total Portfolio	2.0	1.6

Effects of Fine Particulate Emissions (PM2.5)

Category	Specific Effect	Effect has been Quantified	Effect has been Monetized
Reduced Incidence of Mortality from Exposure to Ozone	Premature mortality based on short-term study estimates (all ages)	✓	✓
	Premature mortality based on long-term study estimates (age 30-99)	—	—
Reduced Incidence of Morbidity from Exposure to Ozone	Hospital admissions - respiratory causes (age > 65)	✓	✓
	Hospital admissions - respiratory causes (age < 2)	✓	✓
	Emergency department visits for asthma (all ages)	✓	✓
	Minor restricted-activity days (age 18-65)	✓	✓
	School absence days (age 5-17)	✓	✓
	Decreased outdoor worker productivity (age 18-65)	—	—
	Other respiratory effects (e.g., premature aging of lungs)	—	—
	Cardiovascular and nervous system effects	—	—
Reduced Incidence of Premature Morality from Exposure to PM _{2.5}	Reproductive and developmental effects	—	—
	Adult premature mortality based on cohort study estimates and expert elicitation estimates (age > 25 or age > 30)	✓	✓
Reduced Incidence of Morbidity from Exposure to PM _{2.5}	Infant mortality (age < 1)	✓	✓
	Non-fatal heart attacks (age > 18)	✓	✓
	Hospital admissions—respiratory (all ages)	✓	✓
	Hospital admissions—cardiovascular (age > 20)	✓	✓
	Emergency room visits for asthma (all ages)	✓	✓
	Acute bronchitis (age 8-12)	✓	✓
	Lower respiratory symptoms (age 7-14)	✓	✓
	Upper respiratory symptoms (asthmatics age 9-11)	✓	✓
	Asthma exacerbation (asthmatics age 6-18)	✓	✓
	Lost work days (age 18-65)	✓	✓
	Minor restricted-activity days (age 18-65)	✓	✓
	Chronic Bronchitis (age > 26)	—	—
	Emergency room visits for cardiovascular effects (all ages)	—	—
	Strokes and cerebrovascular disease (age 50-79)	—	—
	Other cardiovascular effects (e.g., other ages)	—	—
	Other respiratory effects (e.g., pulmonary function, non-asthma ER visits, non-bronchitis chronic diseases, other ages and populations)	—	—
	Reproductive and developmental effects (e.g., low birth weight, pre-term births, etc.)	—	—
Cancer, mutagenicity, and genotoxicity effects	—	—	

Volatility Cost Studies Surveyed by the Company

Study	Author(s)	Focus of Study	Price Adder	Focuses on EE?	Year Published
Net Metering in Mississippi	Stanton et al., Synapse Energy	Specific to net metering; no specific energy source	10%	—	2014
Analysis of New England fixed-price electricity contracts	Hornby et al., Synapse Energy	Natural gas and fuel oil	8-10%	✓	2013
PacifiCorp Resource Plan	Rocky Mountain Power	Large overview of all types of energy	9.60%	✓	2013
Solar PV cost-benefit study in New Jersey and Pennsylvania ¹	Stanton et al., Synapse Energy	Specific to net metering; no specific energy source	7.5-18%	—	2014
Analysis of natural Gas, fixed-price contracts	Bolinger et al., Lawrence Berkley National Lab	Natural gas, fixed-price model	17-24%	✓	2002
Analysis of fixed-price contracts for residential customers in Or	Walden Labs	Fixed-price model; coal model before new administrati	8%	—	2013
Vermont Guidelines on Program Screening	Vermont Public Service Board	Natural gas, fuel oil, general renewable portfolio	10%	✓	2015
Oregon Guidelines on Program Screening ¹	Stanton et al., Synapse Energy	Specific to net metering; no specific energy source	10%	—	2014
Value of EE to Reduce Wholesale Price Volatility ²	Baatz, Barrett, Stickles	Review of PJM structure	14%	—	2018

Notes: (1) This study is based upon Net Metering in Mississippi by Synapse Energy; (2) This is a review of PJM as a whole; however, it does mention natural gas volatility.

Source: Direct Testimony of Brendon J. Baatz, p. 14 fn 12.