

**DIVISION OF PUBLIC UTILITIES & CARRIERS
JOINT PRE-FILED DIRECT TESTIMONY**

DIRECT TESTIMONY OF:

JOEL MUNOZ, DIVISION OF PUBLIC UTILITIES & CARRIERS

JENNIFER KALLAY, SYNAPSE ENERGY ECONOMICS, INC.

TIM WOOLF, SYNAPSE ENERGY ECONOMICS, INC.

**On the Topic of the
2023 Annual Energy Efficiency Plan**

November 4, 2022

Table of Contents

1. INTRODUCTION 1
 Joel Munoz 1
 Jennifer Kallay 2
 Tim Woolf 4

2. PURPOSE OF THIS TESTIMONY 5

3. SUMMARY OF KEY ELEMENTS, CONCLUSIONS, AND RECOMMENDATIONS
 REGARDING THE 2023 *EE PLAN* 7

4. ACT ON CLIMATE 11

5. THE VALUE OF GREENHOUSE GAS EMISSIONS 11

6. COST-EFFECTIVENESS 16

7. BUDGETS 21

8. PERFORMANCE INCENTIVE MECHANISM 27

9. RECOMMENDATIONS 31

Exhibit JM-JK-TW-1: Resume of Jennifer Kallay
Exhibit JM-JK-TW-2: Resume of Tim Woolf

1 **1. INTRODUCTION**

2 **Joel Munoz**

3 **Q. MR. MUNOZ, PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

4 A. My name is Joel Munoz. My business address is 89 Jefferson Boulevard, Warwick, Rhode
5 Island 02888.

6 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?**

7 A. I am employed by the Rhode Island Division of Public Utilities and Carriers (Division). I
8 am a Rate Analyst assigned to energy-efficiency-related filings.

9 **Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL**
10 **BACKGROUND.**

11 A. I received a Bachelor of Arts in History and a Master of History Degree from Providence
12 College. I received a Juris Doctorate from Suffolk University School of Law. Prior to
13 joining the Division of Public Utilities, I worked for the Law Offices of Edward G. Lawson,
14 the City of Pawtucket, Legal Department, and the Rhode Island Attorney General's Office,
15 Civil Division.

16 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE RHODE ISLAND PUBLIC**
17 **UTILITIES COMMISSION?**

18 A. Yes, I have testified before the Rhode Island Public Utilities Commission (Commission)
19 in energy-efficiency-related matters. Most recently, I testified before the Commission

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 regarding the *2021–2023 EE Plan* and *2021 EE Plan* in Docket 5076 and *2022 EE Plan* in
2 Docket 5189.

3 **Jennifer Kallay**

4 **Q. MS. KALLAY, PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

5 A. My name is Jennifer Kallay. My business address is 485 Massachusetts Avenue,
6 Cambridge, Massachusetts, 02139. I am employed by Synapse Energy Economic Inc.
7 (Synapse) as a Senior Associate.

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

9 A. Synapse is a research and consulting firm specializing in electricity and gas industry
10 regulation, planning, and analysis. Our work covers a range of issues, including economic
11 and technical assessments of demand-side and supply-side energy resources; energy
12 efficiency policies and programs; power sector transformation; integrated resource
13 planning; electricity market modeling and assessment; renewable resource technologies
14 and policies; and climate change strategies. Synapse works for a wide range of clients,
15 including state attorneys general, offices of consumer advocates, trade associations, public
16 utility commissions, environmental advocates, the U.S. Environmental Protection Agency,
17 U.S. Department of Energy, U.S. Department of Justice, the Federal Trade Commission,
18 and the National Association of Regulatory Utility Commissioners. Synapse has over 40
19 professional staff with extensive experience in the electricity industry.

1 **Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL**
2 **BACKGROUND.**

3 A. I have 15 years of professional experience analyzing the benefits and costs of energy
4 efficiency efforts for jurisdictions in the United States and Canada including
5 Massachusetts, Rhode Island, Hawaii, Vermont, New Jersey, Arkansas, Minnesota,
6 Virginia, Prince Edward's Island, Ontario, and Nova Scotia. Since 2012, I have supported
7 the Rhode Island Division of Ratepayer Advocate in assessing the impacts of utility energy
8 efficiency plans and delivery strategies on customers. My work entails reviewing different
9 regulatory approaches to spur energy efficiency; assessing the ability of utility energy
10 efficiency plans to tap into cost-effective potential; researching best practice program
11 designs and policies; understanding and accounting for the full benefits of energy
12 efficiency; and conducting rate and bill impact, participant, and cost-effectiveness
13 analyses. I received a Bachelor of Arts in Journalism from the University of Maryland and
14 a Master of Energy and Environmental Analysis Degree from Boston University. My
15 resume is attached as Exhibit JM/JK/TW-1.

16 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE RHODE ISLAND PUBLIC**
17 **UTILITIES COMMISSION?**

18 A. Yes, I have testified before the Commission in energy-efficiency-related matters. Most
19 recently, I testified before the Commission regarding the *2021–2023 EE Plan* and *2021 EE*
20 *Plan* in Docket 5076 and *2022 EE Plan* in Docket 5189.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 **Tim Woolf**

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

3 A. My name is Tim Woolf. My business address is 485 Massachusetts Avenue, Cambridge,
4 Massachusetts, 02139. I am employed by Synapse as a Senior Vice President.

5 **Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL**
6 **BACKGROUND.**

7 A. Before joining Synapse, I was a commissioner at the Massachusetts Department of Public
8 Utilities (DPU) from 2007 through 2011. In that capacity, I was responsible for overseeing
9 a substantial expansion of clean energy policies, including significantly increased
10 ratepayer-funded energy efficiency programs; an update of the DPU energy efficiency
11 guidelines; the implementation of decoupled rates for electric and gas companies; the
12 promulgation of net metering regulations; review and approval of smart grid pilot
13 programs; and review and approval of long-term contracts for renewable power. I was also
14 responsible for overseeing a variety of other dockets before the Commission, including
15 several electric and gas utility rate cases.

16 Prior to being a commissioner at the Massachusetts DPU, I was employed as the Vice
17 President at Synapse Energy Economics; a Manager at Tellus Institute; the Research
18 Director at the Association for the Conservation of Energy; a Staff Economist at the
19 Massachusetts Department of Public Utilities; and a Policy Analyst at the Massachusetts
20 Executive Office of Energy Resources. I hold a Masters in Business Administration from

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 Boston University, a Diploma in Economics from the London School of Economics, a BS
2 in Mechanical Engineering and a BA in English from Tufts University. My resume is
3 attached as Exhibit JM/JK/TW-2.

4 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE RHODE ISLAND PUBLIC**
5 **UTILITIES COMMISSION?**

6 A. Yes, I have testified before the Commission in energy-efficiency-related matters. Most
7 recently, I testified before the Commission regarding the *2021–2023 EE Plan* and *2021 EE*
8 *Plan* in Docket 5076 and *2022 EE Plan* in Docket 5189.

9 **2. PURPOSE OF THIS TESTIMONY**

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

11 A. We are testifying on behalf of the Division of Public Utilities and Carriers.

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

13 A. The purpose of this testimony is to provide a review of some key elements of the filed plan
14 for the Commission’s deliberations. The Division reviewed the Narragansett Electric
15 Company d/b/a Rhode Island Energy’s (RIE or the Company) 2023 Annual EE Plan filed
16 on September 30, 2022 referred to herein as the *2023 EE Plan*, to ensure: (1) compliance
17 with R.I. Gen. Laws § 39-1-27.1 (Least Cost Procurement Statute); (2) adherence to the
18 PUC’s Least Cost Procurement (LCP) Standards; (3) advancement of the State of Rhode
19 Island’s energy policies and the goals of R.I. Gen. Laws § 42-6.2-2 (Act on Climate); and

1 (4) promotion of the general interest and welfare of Rhode Island ratepayers. The Division
2 hired Synapse as its expert consultant to assist in its review of RIE’s *2023 EE Plan*.

3 **Q. WHAT IS THE ROLE OF THE DIVISION OF PUBLIC UTILITIES AND**
4 **CARRIERS IN THE DEVELOPMENT OF THE *2023 EE PLAN*?**

5 A. As the Ratepayer Advocate for Rhode Island, the Division monitors the energy efficiency
6 plans on a year-round basis by: (1) observing monthly Technical Working Group (TWG)
7 meetings for both residential programs, and commercial and industrial programs; (2)
8 monitoring and reviewing presentations and documents shared within the TWG meetings;
9 (3) examining programs and conducting informal data requests; (4) reviewing informal
10 monthly status reports issued to the Energy Efficiency & Resource Management Council’s
11 (EERMC) consultants; (5) attending Best Practices meetings when invited by the
12 Company; (6) monitoring the EERMC’s meetings, presentations, and budgets; (7)
13 reviewing drafts of the proposed energy efficiency plans and commenting, as necessary;
14 and (8) reviewing the annual and three-year plans, as filed, for consistency with the LCP
15 Statute and Standards, as well as for affordability for Rhode Island ratepayers. The Division
16 is neither a “stakeholder” *per se* of the TWG, nor a signatory or settling party to the *2023*
17 *EE Plan*. While the Division may agree with certain concepts or approaches in an energy
18 efficiency plan, the Division always reserves its full rights to thoroughly examine all
19 aspects of the plan to ensure that the plan is the best it can be for Rhode Island ratepayers.

1 **3. SUMMARY OF KEY ELEMENTS, CONCLUSIONS, AND RECOMMENDATIONS**
2 **REGARDING THE 2023 EE PLAN**

3 **Q. PLEASE SUMMARIZE THE KEY ELEMENTS OF THE 2023 EE PLAN.**

4 A. The key elements of the *2023 EE Plan* are as follows:

- 5 • The *2023 EE Plan* is the third annual plan within the overarching *2021–2023 EE*
6 *Plan*, the second annual plan since the State passed the *Act on Climate* in 2021, and
7 the first annual plan since the State passed the 100 percent Renewable Energy
8 Standard by 2033 in 2022.
- 9 • The Company proposes to change the methodology for valuing greenhouse gas
10 emissions (GHG) reductions, resulting in a much higher value for avoided GHG
11 emissions. This change significantly impacts the cost-effectiveness analysis results
12 for the *2023 EE Plan*, specifically the RI Test benefit-cost analysis and cost of
13 supply. The Company’s *2023 EE Plan* also proposes to change its calculation of
14 the cost of supply to include only those non-energy impact benefits associated with
15 income-eligible rate discounts and reductions in arrearage and utility carrying costs.
- 16 • The Company inflated program costs to reflect increases in equipment costs, but it
17 did not make corresponding adjustments to the avoided cost calculations.
- 18 • The *2023 EE Plan* proposes a budget decrease of \$3.11 million or 2.1 percent. This
19 includes a budget decrease of \$3.15 million for the electric portfolio which is slightly
20 offset by a budget increase of \$43,000 for the gas portfolio. The electric budget

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 includes a projected carryover of \$32 million from underspending in 2022 from the
2 Commercial & Industrial sector.

- 3 • The *2023 EE Plan* proposes a \$4.3 million performance incentive mechanism (PIM)
4 target incentive pool, which is a decrease in the PIM of \$94,000 or 2.1 percent
5 compared to 2022. The proposed 2023 PIM target incentive pool for the electric
6 portfolio is \$3.5 million, which is an increase of \$111,000 over 2022 due to an
7 increase in projected net benefits. The proposed 2023 PIM target pool for the gas
8 portfolio is \$795,000 which is a decrease of \$205,000 from 2022 due to a decrease
9 in projected net benefits. The Company's *2023 EE Plan* also proposes removing the
10 legislatively mandated Rhode Island Infrastructure Bank (RIIB), Office of Energy
11 Resources (OER), and EERMC costs from the PIM-eligible costs.

12 **Q. PLEASE SUMMARIZE THE DIVISION'S CONCLUSIONS ON THE *2023 EE***
13 ***PLAN*?**

14 A. The Division concludes the following regarding the *2023 EE Plan*:

- 15 • The *2023 EE Plan* is consistent with the LCP Statute and Standards.
- 16 • The *2023 EE Plan* supports the *Act on Climate*, particularly in meeting GHG
17 reduction goals.
- 18 • The Company's proposed change in methodology for calculating the value of
19 non-embedded GHG emissions should be rejected for the *2023 EE Plan*.
20 Instead, the Company should complete the three-year plan cycle using the

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 same methodology used in 2022. The Company should update the RI Test and
2 TRC test benefit-cost ratios and the cost of supply in the *2023 EE Plan*
3 accordingly.

- 4 • Discussions of a proposed new methodology for calculating the value of GHG
5 emissions should be deferred until early 2023, to allow for a thorough vetting
6 and analysis by all parties, with a goal of resolving for implementation in the
7 next three-year plan.
- 8 • The Company's application of inflationary impacts to costs and not to benefits
9 (as described on Bates Page 91) is an imbalance that should be reviewed in the
10 next three-year plan.
- 11 • The Company has not satisfactorily demonstrated with clear and convincing
12 evidence how its proposed budget is realistically aligned with historical
13 spending in 2020, 2021, and 2022.
- 14 • As set forth in the *2023 EE Plan* on Bates pages 87 through 89, the Company's
15 proposal to include only those non-energy impact benefits associated with
16 income-eligible rate discounts and reductions in arrearage and utility carrying
17 costs in its calculation of the cost of supply is sound, because these are utility
18 system costs.
- 19 • The *2023 EE Plan* PIM put forth by the Company is consistent with the
20 guidance laid out in Order No. 24225 as part of Docket 5076 and Order No.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 24440 as part of Docket 5189 and presents updates to the target incentive pools
2 and the service quality adjustments to reflect changes in projected net benefits
3 in the plan. The Division supports the Company’s proposal to remove the
4 RIIB, OER, and EERMC budgets from the PIM-eligible costs.

- 5 • The Division’s full review of the *2023 EE Plan* is incomplete at this time and
6 will continue with the Company’s responses to data requests.

7 **Q. PLEASE SUMMARIZE THE DIVISION’S RECOMMENDATIONS**

8 A. The Division recommends:

- 9 ○ The Commission reject the social cost of carbon (SCC) methodology proposed by
10 the Company for the *2023 EE Plan* year and order the Company to use the New
11 England marginal abatement cost (MAC) method for this final year of the three-
12 year energy efficiency plan.
- 13 ○ The Commission open a docket or conduct a technical session early in 2023 to
14 examine methodologies for valuing GHG emissions reductions, with a goal of
15 completing in sufficient time for inclusion in the next three-year energy efficiency
16 plan.
- 17 ○ The Company investigate adjustment factors to account for the inflationary impacts
18 on avoided costs. These adjustment factors should be applied to the avoided costs
19 used in the energy efficiency potential study and next three-year energy efficiency
20 plan.
- 21 ○ The Commission consider reducing the overall budget for 2023 to be aligned with
22 historical spending in 2020, 2021, and 2022.

- 1 ○ The Commission permit the Division to issue further recommendations upon
2 completion of discovery.

3 **4. ACT ON CLIMATE**

4 **Q. DOES THE *2023 EE PLAN* SUPPORT EFFORTS TO ADDRESS CLIMATE**
5 **ISSUES IN THE STATE?**

6 A. Yes, the *2023 EE Plan* supports the *Act on Climate*, particularly in meeting GHG reduction
7 goals. The Company's *2023 EE Plan* will avoid more than 75,000 short tons of carbon in
8 2023, making it a tool in reaching the ambitious and accelerated GHG reduction goals set
9 out in the *Act on Climate*.

10 **5. THE VALUE OF GREENHOUSE GAS EMISSIONS**

11 **Q. WHAT METHOD HAS THE COMPANY USED IN THE PAST TO ESTIMATE**
12 **THE VALUE OF GHG EMISSIONS?**

13 A. In the *2021 and 2022 EE Plans* the Company used an estimate of GHG emissions from the
14 2021 *Avoided Energy Supply Costs in New England* (AESC) study that employs the New
15 England MAC method of estimating these values. This method results in GHG emissions
16 values of \$124 per short ton of carbon dioxide (in 15 year levelized terms, in 2021 dollars),
17 which is equal to 4.7¢/kWh (in 15 year levelized terms, in 2021 dollars).

The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 Q. HOW IS THE COMPANY ESTIMATING THE VALUE OF GREENHOUSE GAS
2 EMISSIONS IN THE *2023 EE PLAN*?

3 A. The Company is proposing a new method for estimating the value of GHG emissions. It is
4 proposing to use an updated SCC value that was determined in a Supplemental Study to
5 the 2021 AESC (Supplemental 2021 AESC).¹ This updated SCC value is equal to \$393 per
6 short ton of carbon dioxide (in 15 year levelized terms, in 2021 dollars), which is equal to
7 roughly 15¢/kWh (in 15 year levelized terms, in 2021 dollars). The Company claims that
8 this method for estimating the value of GHG emissions is consistent with the *Act on*
9 *Climate* and reflects a more recent, and therefore more accurate, assessment of the value
10 of GHG emissions.²

11 For comparison purposes, Table 1 presents a summary of the GHG values provided by the
12 2021 AESC and the AESC Supplemental Study. The first three rows present the GHG
13 values estimated using the MAC method, and the last two rows present the GHG values
14 estimated using the SCC method. As indicated in this table, the value of GHG emissions
15 can vary significantly depending upon the method used to estimate the value.

¹ Synapse Energy Economics, *AESC 2021 Supplemental Study: Update to Social Cost of Carbon Recommendation*, prepared for the AESC Supplemental Study Group, October 12, 2021 (Supplemental 2021 AESC). This study was overseen by a Massachusetts stakeholder group that included all Massachusetts energy efficiency program administrators, as well as the Massachusetts Department of Energy Resources, the Massachusetts Department of Environmental Protection, the Office of the Massachusetts Attorney General, and the Massachusetts Energy Efficiency Advisory Council.

² 2023 EEP, Attachment 4, pages 12-13.

The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 **Table 1. GHG Emission Values from the 2021 AESC and Supplemental Study**

Method for Estimating GHG Values	Value (\$/short ton)	Value (¢/kWh)
Global MAC	92	3.41
New England MAC: electric	125	4.74
New England MAC: multiple sectors	493	19.72
SCC from 2021 AESC	128	4.87
SCC from AESC Supplemental Study	393	15.0

2 *Sources: 2021 AESC Study, page 17. Supplemental AESC Study, pages 18 and 20.*

3 *Values are in 15 year levelized terms, in 2021 dollars.*

4 **Q. HOW DOES THE COMPANY APPLY THIS NEW VALUE OF GHG EMISSIONS**
5 **IN THE 2023 EE PLAN?**

6 A. The Company, for the first time in Rhode Island, uses a hybrid approach which applies the
7 historically utilized New England MAC for some end-uses and the SCC for others. The
8 Company employs the New England MAC for measures that involve new fossil fuel
9 process heating, space heating, or water heating equipment regardless of the customer's
10 prior heating source and employs the SCC method for all other measures. This hybrid
11 approach is based on the approach used in Massachusetts.³

12 **Q. WHAT IS THE DIVISION'S POSITION ON THIS NEW METHOD FOR**
13 **ESTIMATING THE VALUE OF GHG EMISSIONS?**

14 A. The Division opposes this approach, both for the use of a new methodology, as well as the
15 hybrid nature of the methodology. The Division is highly cognizant of the importance of
16 addressing the requirements of the Rhode Island *Act on Climate* and the role of energy

³ 2023 EEP, Attachment 4, page 12.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 efficiency in meeting those requirements. The Division also recognizes the value of using
2 GHG emission value estimates that are up-to-date and reflect the specific conditions and
3 policy goals in Rhode Island.

4 However, the Division has concerns with the methodology proposed by the Company.
5 Calculations used to estimate the value of GHG emissions are highly complex. There are
6 multiple calculation methods that can be used for these calculations leading to very
7 different results and the results can vary dramatically depending upon several key
8 assumptions. The Division submits that this is a complex issue which will significantly
9 affect the cost-effectiveness analysis of energy efficiency programs. Therefore, a change
10 in methodology requires considerably more discussion and vetting by stakeholders before
11 being applied to an energy efficiency plan. Further, we do not agree with the Company's
12 hybrid approach for using different GHG values for emissions from different of end-uses.

13 **Q. WHAT GHG VALUE AND METHODOLOGY DOES THE DIVISION**
14 **RECOMMEND FOR THE *2023 EE PLAN*?**

15 A. The Division recommends that the Company continue to use the New England MAC
16 methodology.

17 **Q. WOULD USING THE GHG VALUE FROM THE *2022 EE PLAN* HAVE ANY**
18 **PRACTICAL IMPACTS ON THE *2023 EE PLAN*?**

19 A. According to the Company, using the former GHG value is likely to have no practical
20 impact on the programs in the *2023 EE Plan* because the programs continue to be cost-
21 effective even with the former number. The Company represents that it examined the cost-

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 effectiveness of its proposed 2023 programs using the previous GHG value assumption
2 and found that all programs would still be cost-effective.⁴ The Division issued data requests
3 on this topic which remain outstanding at the time of this submission. As such, the Division
4 would request the opportunity to provide further comment after its receipt of discovery.

5 **Q. HOW DO YOU RECOMMEND THAT THE COMMISSION ADDRESS THIS**
6 **ISSUE AFTER THE *2023 EE PLAN*?**

7 A. The Division recommends that the Commission address this issue in more detail in early
8 2023, to provide an opportunity to discuss advantages and disadvantages of different
9 options and to provide more complete evidence for the Commission to decide on this
10 important input. It is imperative that this process be completed prior to the assessment of
11 energy efficiency potential and initiation of the three-year planning process. The resulting
12 methodology should then be applied in developing the assessment of energy efficiency
13 potential and as key inputs into the cost-effectiveness analysis for the next three-year
14 energy efficiency plan.

⁴ Direct Testimony of Moreira, Feldman, Li, Kessler, and Crayne, in Docket 22-33-EE, page 33.

1 **6. COST-EFFECTIVENESS**

2 **Q. HOW WILL THE DIVISION’S TESTIMONY IN THIS SECTION BE AFFECTED**
3 **BY UPDATES TO THE VALUE OF GREENHOUSE GAS EMISSIONS**
4 **REDUCTION METHODOLOGY?**

5 A. The testimony in this section is based on the information contained in the *2023 EE Plan*
6 filed on September 30, 2022 and corrected on October 13, 2022. This information includes
7 the calculation of carbon benefits using a new methodology proposed by the Company,
8 which the Division requests that the Commission reject. The Division has also asked
9 discovery questions that, once received, will provide new values for this section of the
10 testimony. The Division plans to submit supplemental testimony on the topic of cost-
11 effectiveness based on the Company’s responses to this discovery.

12 **Q. PLEASE SUMMARIZE THE COST-EFFECTIVENESS OF THE *2023 EE PLAN***
13 **PROPOSED BY THE COMPANY BASED UPON THE RI TEST BENEFIT-COST**
14 **RATIOS.**

15 A. The electric and gas benefit-cost ratios are increasing in 2023 as compared to 2022, due to
16 an increase in carbon benefits. Table 2 shows the increase in electric portfolio RI Test
17 benefit-cost ratios by sector and overall, for 2023 versus 2022.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 **Table 2. Electric RI Test Benefit-Cost Ratios**

Electric	2022 Plan	2023 Plan	Difference (2023 vs. 2022)	% Difference (2023 vs. 2022)
Non-Income Eligible Residential	1.57	2.43	0.86	54.8%
Income Eligible Residential	2.03	2.15	0.12	5.9%
Commercial & Industrial	1.98	2.86	0.88	44.4%
Total	1.77	2.51	0.74	41.8%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Electric Plan from Docket No. 22-33-EE, The Narragansett Electric Company's d/b/a Rhode Island Energy's Annual Energy Efficiency Plan for 2023, September 30, 2022.

2
3 Table 3 shows the increase in gas portfolio RI Test benefit-cost ratios in the Non-Income-
4 Eligible Residential sector and overall, for 2023 versus 2022, and a decrease for the
5 Income-Eligible Residential and Commercial & Industrial sectors. The increase in the Non-
6 Income-Eligible Residential sector is offsetting the decreases in the Income-Eligible
7 Residential and Commercial & Industrial sectors.

8 **Table 3. Gas RI Test Benefit-Cost Ratios**

Gas	2022 Plan	2023 Plan	Difference (2023 vs. 2022)	% Difference (2023 vs. 2022)
Non-Income Eligible Residential	1.36	2.24	0.88	64.7%
Income Eligible Residential	3.28	2.66	(0.62)	-18.9%
Commercial & Industrial	4.79	4.76	(0.03)	-0.6%
Total	2.72	2.95	0.23	8.5%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Gas Plan from Docket No. 22-33-EE, 2023 Annual Energy Efficiency Plan Corrections to Gas Performance Incentive Earnings Opportunity and Benefits for Home Energy Reports, October 13, 2022.

9

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 Table 4 shows the change in RI Test benefits and costs for 2023 versus 2022 for the electric
2 portfolio. Electric portfolio costs increased by \$1.1 million from 2022 to 2023, due to
3 increases in customer contributions and the performance incentive. Electric portfolio
4 benefits increased by \$90.6 million due to a tripling of the carbon benefits.

5 **Table 4. Electric RI Test Benefits and Costs**

Electric		2022		2023		Difference (2023 vs. 2022)	
		\$	% Distribution	\$	% Distribution	\$	% Distribution
Capacity	Summer Generation	\$ 6,555,000	3%	\$ 5,670,000	2%	\$ (885,000)	-1%
	Capacity DRIPE	\$ 12,794,000	6%	\$ 13,605,000	4%	\$ 811,000	-1%
	Transmission	\$ 15,917,000	7%	\$ 15,453,000	5%	\$ (464,000)	-2%
	Distribution	\$ 15,770,000	7%	\$ 17,542,000	6%	\$ 1,772,000	-1%
	Reliability	\$ 1,270,000	1%	\$ 1,667,000	1%	\$ 397,000	0%
Electric Energy	Winter Peak	\$ 19,785,000	9%	\$ 16,131,000	5%	\$ (3,654,000)	-4%
	Winter Off Peak	\$ 16,456,000	7%	\$ 13,812,000	4%	\$ (2,644,000)	-3%
	Summer Peak	\$ 10,491,000	5%	\$ 9,321,000	3%	\$ (1,170,000)	-2%
	Summer Off Peak	\$ 6,894,000	3%	\$ 6,494,000	2%	\$ (400,000)	-1%
	Electric Energy DRIPE	\$ 22,659,000	10%	\$ 18,366,000	6%	\$ (4,293,000)	-4%
Non-Electric Benefits	Natural Gas	\$ (2,397,000)	-1%	\$ (698,000)	0%	\$ 1,699,000	1%
	Oil	\$ 17,547,000	8%	\$ 22,872,000	7%	\$ 5,325,000	-1%
	Other-Resource	\$ 2,083,000	1%	\$ 3,877,000	1%	\$ 1,794,000	0%
	Non-Resource	\$ 32,688,000	15%	\$ 29,828,000	9%	\$ (2,860,000)	-5%
Societal	Carbon Benefits	\$ 44,432,000	20%	\$ 139,316,000	44%	\$ 94,884,000	24%
	Nox Benefits	\$ 1,241,000	1%	\$ 1,521,000	0%	\$ 280,000	0%
Total Benefits (excluding Econ)		\$ 224,185,000	100%	\$ 314,777,000	100%	\$ 90,592,000	0%
Program Implementation		\$ 105,281,000	85%	\$ 102,018,000	81%	\$ (3,263,000)	-3%
Customer Contribution		\$ 15,795,000	13%	\$ 20,064,000	16%	\$ 4,269,000	3%
Performance Incentive		\$ 3,390,000	3%	\$ 3,501,000	3%	\$ 111,000	0%
Total Costs		\$ 124,466,000	100%	\$ 125,583,400	100%	\$ 1,117,400	0%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Electric Plan from Docket No. 22-33-EE, The Narragansett Electric Company's d/b/a Rhode Island Energy's Annual Energy Efficiency Plan for 2023, September 30, 2022.

6
7 Table 5 shows the change in RI Test benefits and costs for 2023 versus 2022 for the gas
8 portfolio. Gas portfolio costs decreased by \$0.9 million from 2022 to 2023, due to
9 decreases in customer contributions and the performance incentive. Gas portfolio benefits

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 increased by \$7.8 million. Carbon benefits increased by \$34.2 million, but \$24.9 million
2 of this increase was offset by a reduction in non-resource benefits.

3 **Table 5. Gas RI Test Benefits and Costs**

Gas		2022		2023		Difference	
		\$	% Distribution	\$	% Distribution	\$	% Distribution
Natural Gas Benefits	Natural Gas	\$ 32,674,000	26%	\$ 29,750,000	23%	\$ (2,924,000)	-4%
	Natural Gas DRIPE	\$ 462,000	0%	\$ 313,000	0%	\$ (149,000)	0%
Capacity	Summer Generation	\$ 106,000	0%	\$ 347,000	0%	\$ 241,000	0%
	Capacity DRIPE	\$ 214,000	0%	\$ 808,000	1%	\$ 594,000	0%
	Transmission	\$ 139,000	0%	\$ 477,000	0%	\$ 338,000	0%
	Distribution	\$ 138,000	0%	\$ 586,000	0%	\$ 448,000	0%
	Reliability	\$ 11,000	0%	\$ 41,000	0%	\$ 30,000	0%
Electric Energy	Winter Peak	\$ 71,000	0%	\$ 94,000	0%	\$ 23,000	0%
	Winter Off Peak	\$ 82,000	0%	\$ 92,000	0%	\$ 10,000	0%
	Summer Peak	\$ 83,000	0%	\$ 212,000	0%	\$ 129,000	0%
	Summer Off Peak	\$ 72,000	0%	\$ 179,000	0%	\$ 107,000	0%
	Electric Energy DRIPE	\$ 64,000	0%	\$ 138,000	0%	\$ 74,000	0%
Non-Electric and Non-Gas Benefits	Oil and Oil DRIPE	\$ -	0%	\$ -	0%	\$ -	0%
	Other-Resource	\$ 747,000	1%	\$ 662,000	1%	\$ (85,000)	0%
	Non-Resource	\$ 59,170,000	48%	\$ 34,233,000	26%	\$ (24,937,000)	-22%
Societal	Carbon Benefits	\$ 27,205,000	22%	\$ 61,446,000	47%	\$ 34,241,000	25%
	Nox Benefits	\$ 2,811,000	2%	\$ 2,514,000	2%	\$ (297,000)	0%
Total Benefits (excluding Econ)		\$ 124,049,000	100%	\$ 131,892,000	100%	\$ 7,843,000	0%
Program Implementation		\$ 36,081,500	79%	\$ 36,154,000	81%	\$ 72,500	2%
Customer Contribution		\$ 8,562,700	19%	\$ 7,815,700	17%	\$ (747,000)	-1%
Performance Incentive		\$ 1,000,000	2%	\$ 795,200	2%	\$ (204,800)	0%
Total Costs		\$ 45,644,200	100%	\$ 44,764,900	100%	\$ (879,300)	0%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Gas Plan from Docket No. 22-33-EE, 2023 Annual Energy Efficiency Plan Corrections to Gas Performance Incentive Earnings Opportunity and Benefits for Home Energy Reports, October 13, 2022.

4
5 **Q. PLEASE SUMMARIZE THE COST-EFFECTIVENESS OF THE 2023 EE PLAN**
6 **PROPOSED BY THE COMPANY BASED UPON THE COST OF SUPPLY.**

7 The electric and gas portfolios are cost-effective because the cost of the energy efficiency
8 programs is lower than the cost of supply. Table 6 depicts the cost of the energy efficiency

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 programs, cost of supply, and the difference between the two costs for the electric and gas
2 portfolios.

3 **Table 6. Electric and Gas Cost of Energy Efficiency Programs vs. Cost of Supply**

	Electric	Gas
Cost of EE Programs (\$M)	\$125.6	\$44.7
Cost of Supply (\$M)	\$284.6	\$97.5
Difference (\$M, EE Programs-Supply)	(\$159.0)	(\$52.8)

4 *Source: Docket No. 22-33-EE, The Narragansett Electric Company's d/b/a Rhode Island Energy's Annual Energy Efficiency Plan for 2023, Table 16. Costs of Energy Efficiency and Costs of Energy Supply, Bates Page 89, September 30, 2022.*

5 The Company proposes to include only those non-energy impacts that are utility system
6 costs in its calculation of the cost of supply. These include: (1) costs associated with energy
7 being sold at the income-eligible rate and (2) costs associated with arrearage and utility
8 carrying from unpaid energy bills. Together, these costs represent \$260,000 of the electric
9 cost of supply (0.1 percent) and \$535,000 of the gas cost of supply (0.5 percent).⁵

10 **Q. WHAT IS THE DIVISION'S POSITION ON THE COST-EFFECTIVENESS OF**
11 **THE 2023 EE PLAN PROPOSED BY THE COMPANY BASED UPON THE COST**
12 **OF SUPPLY.**

13 The Division supports the proposed updates to the cost of supply because the non-energy
14 impact benefits associated with income-eligible rate discounts and reductions in arrearage
15 and utility carrying costs are utility system costs.

⁵ 2023 EE Plan. Table 16. Costs of Energy Efficiency and Costs of Energy Supply. Bates page 89.

1 **Q. DOES THE DIVISION HAVE ANY FURTHER COMMENTS ON COST-**
2 **EFFECTIVENESS?**

3 A. Yes. The Division understands that the Company inflated program costs to reflect increases
4 in equipment costs, but without corresponding adjustments to the avoided cost calculations.
5 The Company did not adjust avoided costs to reflect increases in equipment costs because
6 it applied the avoided cost values from the 2021 AESC. The Division submits that these
7 unaccounted-for impacts are significant enough to warrant further adjustments and
8 application of these adjustments to the energy efficiency potential study and next three-
9 year energy efficiency plan.

10 **7. BUDGETS**

11 **Q. PLEASE SUMMARIZE THE *2023 EE PLAN* BUDGETS PROPOSED BY THE**
12 **COMPANY.**

13 A. The proposed *2023 EE Plan* electric and gas budgets represent a combined 2.1 percent
14 decrease from the *2022 EE Plan* electric and gas budgets and is in conformance with the
15 Commission's guidance in Order 24225. The proposed electric budget is decreasing from
16 \$108.7 million in 2022 to \$105.5 million in 2023, a decrease of \$3.1 million dollars or 2.9
17 percent. The proposed gas budget is increasing from \$36.91 million in 2022 to \$36.95
18 million in 2023, an increase of \$43,000 dollars or 0.1 percent. Table 7 provides this budget
19 summary.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 **Table 7. Budget Summary**

	2022 Plan	2023 Plan	Difference (2023 vs. 2022)	% Difference (2023 vs. 2022)
Electric	\$ 108,671,300	\$ 105,519,200	\$ (3,152,100)	-2.9%
Gas	\$ 36,906,000	\$ 36,948,800	\$ 42,800	0.1%
Total Budget	\$ 145,577,300	\$ 142,468,000	\$ (3,109,300)	-2.1%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Electric Plan from Docket No. 22-33-EE, The Narragansett Electric Company's d/b/a Rhode Island Energy's Annual Energy Efficiency Plan for 2023, September 30, 2022.

3) 2023 Gas Plan from Docket No. 22-33-EE, 2023 Annual Energy Efficiency Plan Corrections to Gas Performance Incentive Earnings Opportunity and Benefits for Home Energy Reports, October 13, 2022.

2

3 In the proposed electric budget, the Company Incentive is increasing by 3 percent and the

4 Non-Income-Eligible Residential, Income-Eligible Residential, Commercial & Industrial

5 and Regulatory budgets are decreasing by 1.9 to 5.9 percent. The Regulatory and Non-

6 Income-Eligible Residential components are decreasing by a greater percentage than the

7 Commercial & Industrial and Income-Eligible Residential components. Table 8 provides a

8 more detailed budget breakout for the electric portfolio.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 **Table 8. Electric Budget Breakout**

Electric	2022 Plan	2023 Plan	Difference (2023 vs. 2022)	% Difference (2023 vs. 2022)
Non-Income Eligible Residential	\$ 32,857,400	\$ 31,371,200	\$ (1,486,200)	-4.5%
Income Eligible Residential	\$ 16,814,300	\$ 16,331,300	\$ (483,000)	-2.9%
Commercial & Industrial	\$ 49,564,100	\$ 48,626,000	\$ (938,100)	-1.9%
Regulatory	\$ 6,045,400	\$ 5,689,500	\$ (355,900)	-5.9%
Company Incentive	\$ 3,390,200	\$ 3,501,200	\$ 111,000	3.3%
Total Budget	\$ 108,671,400	\$ 105,519,200	\$ (3,152,200)	-2.9%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Electric Plan from Docket No. 22-33-EE, The Narragansett Electric Company's d/b/a Rhode Island Energy's Annual Energy Efficiency Plan for 2023, September 30, 2022.

2
3 In the proposed gas budget, the Company Incentive is decreasing 20 percent, the Income-
4 Eligible Residential, Commercial & Industrial, and Regulatory budgets are decreasing by
5 2.9 to 7.1 percent, and the Non-Income-Eligible Residential budget is increasing by 8.7
6 percent. Table 9 provides a more detailed budget breakout for the gas portfolio.

7 **Table 9. Gas Budget Breakout**

Gas	2022 Plan	2023 Plan	Difference (2023 vs. 2022)	% Difference (2023 vs. 2022)
Non-Income Eligible Residential	\$ 14,875,000	\$ 16,171,400	\$ 1,296,400	8.7%
Income Eligible Residential	\$ 9,317,600	\$ 8,658,600	\$ (659,000)	-7.1%
Commercial & Industrial	\$ 9,435,800	\$ 9,160,700	\$ (275,100)	-2.9%
Regulatory	\$ 2,277,600	\$ 2,162,900	\$ (114,700)	-5.0%
Company Incentive	\$ 1,000,000	\$ 795,200	\$ (204,800)	-20.5%
Total Budget	\$ 36,906,000	\$ 36,948,800	\$ 42,800	0.1%

Sources:

1) 2022 Plan from Docket 5189, 2022 Annual Energy Efficiency Program Plan Compliance, Second Revised Electric and Gas Tables, January, 27, 2022.

2) 2023 Gas Plan from Docket No. 22-33-EE, 2023 Annual Energy Efficiency Plan Corrections to Gas Performance Incentive Earnings Opportunity and Benefits for Home Energy Reports, October 13, 2022.

The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 Q. DOES THE DIVISION HAVE ANY CONCERNS RELATED TO THE ELECTRIC
2 BUDGET PROPOSED IN THE *2023 EE PLAN*?

3 A. Yes. The Company's performance in recent years, summarized below, does not inspire
4 confidence that the Company presently has the ability to utilize the proposed *2023 EE Plan*
5 budget. Table E-1 of the *2023 EE Plan* projects an end-of-year balance for the *2022 EE*
6 *Plan* of \$32 million, coming exclusively from the Commercial & Industrial sector. The
7 Company has not identified with any specificity what incremental steps or activities it will
8 undertake to effectuate substantial and necessary course corrections to right-size its
9 activities to match its proposed budget in 2023. This observation is not necessarily a
10 criticism solely of the Company's efforts, but rather a combination of post-pandemic
11 realities such as inflation, supply-chain delays, labor issues, and unrest across the globe
12 affecting energy markets.

13 The Division submits that the Company has a responsibility to collect from its customers
14 an amount commensurate with its ability to utilize in a calendar year. Right-sized budget
15 funding is more critical now that Rhode Island ratepayers find themselves faced with
16 historically high electricity and gas rates. The Division's review highlights the fact that
17 there has been consistent and significant underspending relative to proposed budgets since
18 the pandemic began.

19 Based on the Company's filed Year-End Reports, the *2020 EE Plan* had a year-end balance
20 of almost \$23 million, the *2021 EE Plan* had a year-end balance of over \$20 million, and
21 as mentioned above, the *2022 EE Plan* has a projected year-end balance of over \$32

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 million. The Company spent 83 percent of its electric implementation budget of \$106
 2 million or \$88 million in the *2020 EE Plan*. The Company spent 85 percent of its electric
 3 implementation budget of \$111 million or \$94.5 million in the *2021 EE Plan*. In the *2022*
 4 *EE Plan*, the Company submitted a Second Quarter Report projecting year-end forecast
 5 spend of 91 percent, or \$95.6 million, of its \$105 million electric implementation budget.
 6 However, based on informal 3rd quarter reporting, it appears that the second quarter
 7 projections were overly optimistic. The average spend on the electric energy efficiency
 8 plans over the course of the pandemic years is about \$92.7 million with the average
 9 percentage of actual budget spend to proposed budget at 86 percent. The average spend in
 10 the three years prior to the pandemic, in the *2017, 2018, and 2019 EE Plans*, was about
 11 \$91.4 million with the average percentage of actual budget spend to proposed budget at
 12 100 percent. Table 10 provides a summary of the actual spend as compared to the
 13 implementation budget for *EE Plan* years 2017 to 2022.

Table 10. Actual Spend vs. Budget Spend for EE Plan Years 2017 through 2022

	EE Plan Year (\$000s)					
	2017	2018	2019	2020	2021	2022
Budget (without Company Incentive)	\$88,511	\$86,933	\$97,847	\$106,029	\$111,286	\$105,281
Actual Spend	\$88,348	\$85,215	\$100,729	\$88,224	\$94,564	\$95,806
Percentage of Budget Spent	100%	98%	103%	83%	85%	91%
Year-End Balance	\$9,415	\$0	\$3,745	\$22,821	\$20,359	\$32,258

16 The Company states that the recent acquisition has brought in new leadership with a
 17 renewed focus on executing on planned budgets and that its proposed budget is based on
 18 realistic expectations. However, the Company has not convinced the Division with any
 19 specifics that this coming year will be any different from previous pandemic years,

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 including the *2022 EE Plan*. In the Division’s opinion, the ripple effects of inflation,
2 workforce shortages, and supply chain issues will likely have the same impact relative to
3 budgetary spend on the *2023 EE Plan* that it did on the *2020, 2021, and 2022 EE Plans*.

4 As such, the Division submits that this plan year may present an opportunity for the
5 Commission to reset and right-size the budget for post-pandemic conditions to be aligned
6 with realistic spending projections, based on the year-end results of 2020, 2021, and 2022.

7 **Q. DOES THE DIVISION HAVE ANY OTHER CONCERNS REGARDING TRENDS**
8 **IN THE *2023 EE PLAN* OVERALL?**

9 A. Yes, the Division is concerned with the dramatic decreases in MWh annual and lifetime
10 savings for ratepayers and resulting increase in cost per dollar for kWh savings. Table 11
11 summarizes this trend over time.

12 **Table 11. Cost per Annual and Lifetime Savings (\$/kWh) for EE Plan Years 2017 through 2023**

	EE Plan Year (\$000s)						
	2017	2018	2019	2020	2021	2022 (as approved)	2023 (as filed)
Budget Spend	\$ 91,087	\$ 93,924	\$ 107,438	\$ 91,443	\$ 97,987	\$ 108,671	\$105,519
MWh Annual Savings	232,023	206,209	190,159	157,356	131,365	111,983	99,358
MWh Lifetime Savings	2,327,916	1,848,845	1,624,417	1,299,159	1,046,790	833,808	685,209
Cost per kWh of Annual Savings	\$ 0.39	\$ 0.46	\$ 0.56	\$ 0.58	\$ 0.75	\$ 0.97	\$ 1.06
Cost per kWh of Lifetime Savings	\$ 0.04	\$ 0.05	\$ 0.07	\$ 0.07	\$ 0.09	\$ 0.13	\$ 0.15

13
14 While the Division acknowledges other benefits such as reduced carbon emissions and
15 economic development, which continue to make these programs cost-effective as required
16 by the LCP Statute and instrumental to the goals of the *Act on Climate*, the Division cannot

1 ignore the fact that ratepayers are spending more and more on energy efficiency while at
2 the same receiving less and less in the way of direct kWh savings benefits.

3 **8. PERFORMANCE INCENTIVE MECHANISM**

4 **Q. PLEASE SUMMARIZE THE INCENTIVE MECHANISM PROPOSED BY THE**
5 **COMPANY FOR THE 2023 EE PLAN.**

6 A. The Company has adopted the same incentive mechanism that was approved by the
7 Commission for the *2022 EE Plan*, with one modification. In Order 24225, issued on
8 September 21, 2021 as part of Docket 5076, the Commission updated the energy efficiency
9 performance incentive framework to better incentivize the Company to meet Rhode
10 Island's goals while balancing ratepayer costs. Order 24440, issued on July 11, 2022 as
11 part of Docket 5189, the Commission, approved the incentive mechanism for the *2022 EE*
12 *Plan* and updated the payout rates to reflect the updated PIM-eligible net benefits of the
13 *2022 EE Plan*. The *2023 EE Plan* incentive put forth by the Company is consistent with
14 the guidance laid out in these two orders and presents updates to the target incentive pools
15 and the service quality adjustments to reflect changes in projected net benefits in the plan.

16 **Q. WHAT MODIFICATIONS HAS THE COMPANY PROPOSED TO THE**
17 **INCENTIVE MECHANISM APPROVED BY THE COMMISSION FOR THE 2022**
18 **EE PLAN?**

19 A. The Company proposes removing legislatively mandated transfers to the RIIB, OER, and
20 the EERMC from PIM-eligible costs.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 **Q. WHAT IS THE DIVISION’S POSITION ON THE COMPANY’S PROPOSAL TO**
2 **REMOVE THE RIIB, OER, AND EERMC BUDGETS FROM THE PIM-**
3 **ELIGIBLE COSTS?**

4 A. The Division supports this modification. The Company has no control over these regulatory
5 costs, and they do not directly influence the Company’s implementation of the energy
6 efficiency programs. Therefore, these costs should not be included in the incentive
7 mechanism.

8 **Q. PLEASE SUMMARIZE THE TARGET EARNINGS INCENTIVES IN THE *EE***
9 ***PLAN*.**

10 A. The PIMs for the electric and gas programs for 2023 are summarized in Table 12 and Table
11 13.

12 **Table 12. Summary of Company Incentives - Electric (\$000)**

	Eligible Costs	Eligible Benefits	Eligible Net Benefits	Payout Rate	Target Incentive
Non-Income Eligible Residential	\$ 29,683	\$ 36,594	\$ 6,911	10%	\$ 698
Income Eligible Residential	\$ 16,615	\$ 8,431	\$ (8,184)	25%	\$ -
Commercial & Industrial	\$ 43,174	\$ 70,910	\$ 27,736	10%	\$ 2,803
Total	\$ 89,472	\$ 115,935	\$ 26,463	13%	\$ 3,501

Source:

*2023 Electric Plan from Docket No. 22-33-EE, The Narragansett Electric Company’s d/b/a
Rhode Island Energy’s Annual Energy Efficiency Plan for 2023, September 30, 2022.*

13

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

1 **Table 13. Summary of Company Incentives – Gas (\$000)**

	Eligible Costs	Eligible Benefits	Eligible Net Benefits	Payout Rate	Target Incentive
Non-Income Eligible Residential	\$ 16,892	\$ 13,040	\$ (3,852)	25%	\$ -
Income Eligible Residential	\$ 9,379	\$ 3,390	\$ (5,990)	25%	\$ -
Commercial & Industrial	\$ 9,817	\$ 15,986	\$ 6,170	12%	\$ 722
Total	\$ 36,088	\$ 32,416	\$ (3,672)	0%	\$ 722

Source:

2023 Gas Plan from Docket No. 22-33-EE, 2023 Annual Energy Efficiency Plan Corrections to Gas Performance Incentive Earnings Opportunity and Benefits for Home Energy Reports, October 13, 2022.

2

3 **Q. HOW DO THE PROPOSED 2023 TARGET INCENTIVE POOLS COMPARE**
4 **WITH THE 2022 TARGET INCENTIVE POOLS?**

5 A. The proposed 2023 electric program target incentive pool equals \$3,501,153, which is
6 \$110,988 *greater than* the incentive pool in 2022 due to an increase in projected net
7 benefits. The 2023 gas program target incentive pool is set at \$721,940, which is \$278,060
8 *less than* the pool in 2022 due to a decrease in projected net benefits.⁶ The relevant metrics
9 used to determine these incentive target pools are detailed in Table 12 and Table 13.

10 **Q. WHAT IS THE DIVISION’S POSITION ON THE PROPOSED 2023 TARGET**
11 **INCENTIVE POOLS.**

12 A. The Division does not oppose the proposed target incentive pools. In Docket 5189, the
13 Division recommended that the target incentive pool should be revisited each year to ensure
14 that it reflects the conditions of the new plan. In Order No. 24445, the Commission was

⁶ 2022 EE Plan, page 66.

1 clear that the target incentive pool should be modified each year to reflect changes to the
2 eligible net benefits of the program.⁷

3 The payout rates set the proportion of the eligible PIM benefits that can be used for the
4 target incentive pool. If the payout rates are held constant from year to year, then the target
5 incentive pool will automatically adjust to reflect the same proportion of the eligible net
6 benefits.⁸ The Company has held the payout rates constant since the *2022 EE Plan* and
7 therefore has complied with the Commission's directive to reflect changes in the net
8 benefits.⁹

9 **Q. HOW DO THE PROPOSED 2023 SERVICE QUALITY ADJUSTMENTS (SQAS)**
10 **COMPARE WITH THE 2022 SQAS?**

11 A. The Non-Income-Eligible Residential electric program is estimated to have positive PIM-
12 eligible net benefits. Consequently, the Non-Income-Eligible Residential program is not
13 subject to an SQA in the *2023 EE Plan*. This is a change from the *2022 EE Plan*, where
14 this program had negative PIM-eligible net benefits and therefore was subject to an SQA.

15 For the Income-Eligible Residential electric program, which still has negative PIM-eligible
16 net benefits, the Company proposes to reduce the maximum service adjustment from

⁷ Order 24445, page 25.

⁸ For those sectors with negative eligible net benefits, the payout rates do not affect the target incentive pool. For these sectors, the service quality adjustments determine the ultimate target incentive pool, as described below.

⁹ Further, this approach results in target incentive pools that are 3.9% of the electricity program budgets and 2.0% of the gas program budgets, which is a reasonable outcome for this benchmark. This approach provides the Company with incentives equal to roughly 70 basis points for the electric program and 20 basis points for the gas program, which should be sufficient to motivate the Company to optimize the eligible net benefits of these programs.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony
Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf**

1 \$443,300 in 2022 to \$326,469 in 2023. This downward adjustment is based on the
2 percentage reduction in PIM-eligible benefits for this sector, relative to the *2022 EE Plan*.¹⁰

3 For the gas programs, the Company is proposing to reduce the maximum SQA for Income-
4 Eligible Residential from \$171,275 in 2022 to \$123,176 in 2023 and increase the maximum
5 SQA for Non-Income-Eligible Residential from \$290,063 in 2022 to \$344,262 in 2023.
6 These adjustments are based on the percentage changes in the PIM-eligible benefits for
7 these sectors, relative to the *2022 EE Plan*.¹¹

8 **Q. WHAT IS THE DIVISION’S POSITION ON THE PROPOSED 2023 SQAS?**

9 A. The Division supports the proposed 2023 SQAs proposed by the Company. These
10 adjustments are consistent with the Commission directives and reflect the changes to the
11 PIM-eligible benefits relative to the *2022 EE Plan*.

12 **9. RECOMMENDATIONS**

13 **Q. PLEASE SUMMARIZE THE DIVISION’S RECOMMENDATIONS.**

14 A. The Division recommends:

15 ○ The Commission reject the SCC methodology proposed by the Company for the
16 *2023 EE Plan* year and order the Company to use the New England MAC method
17 for this final year of the three-year energy efficiency plan.

¹⁰ 2023 EE Plan, page 66.

¹¹ 2023 EE Plan, page 66.

**The Narragansett Electric Company
d/b/a Rhode Island Energy
Docket 22-33-EE: 2023 Annual Plan
Division Direct Testimony**

Witnesses: Joel Munoz, Jennifer Kallay, and Tim Woolf

- 1 ○ The Commission open a docket or conduct a technical session early in 2023 to
2 examine methodologies for valuing GHG emissions reductions, with a goal of
3 completing in sufficient time for inclusion in the next three-year energy efficiency
4 plan.

- 5 ○ The Commission consider reducing the overall budget for 2023 to be aligned with
6 historical spending in 2020, 2021, and 2022.

- 7 ○ The Commission permit the Division to issue further recommendations upon
8 completion of discovery.

9 **Q. DOES THIS CONCLUDE OF THE DIVISION’S DIRECT TESTIMONY?**

10 **A. Yes, it does.**

11

Jennifer Kallay, Senior Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617-453-7034
jkallay@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Associate*, June 2013 – present, *Associate*, July 2008 – June 2013, *Research Associate*, January 2007 – July 2008.

More than a decade of experience analyzing the benefits and costs of electric and natural gas energy efficiency efforts for jurisdictions in the United States and Canada. Most recently, Ms. Kallay is researching and analyzing policies and practices regarding transportation, utility transformation, resiliency and utility/community engagement on energy-related issues, and strategies that cities and towns can use to reduce emissions.

- Managing the Synapse project team responsible for reviewing Green Community Annual Reports, verifying whether municipalities have reached their 20 percent energy reduction goals, and developing a Progress Report for the program highlighting achievements to date. Identifies strategies that are effective across towns and makes recommendations to continue to advance and improve the program.
- Developing a City of Burlington net zero energy roadmap for the Burlington Electric Department. Includes assembling baseline emissions and a trajectory, setting a net zero energy trajectory and milestone goals, and assessing and selecting policies and practices to achieve net zero energy.
- Researching the safety benefits of CAFE Standards and future transportation developments like vehicle electrification, ride sharing, and autonomous vehicles.

Boston University's Center for Energy and Environmental Studies, Boston, MA. *Research Assistant for Professor Robert Kaufmann*, January 2006 – January 2007.

Modeled land use change in the Amazon using spatial, economic, climatic, and physical variables and GIS and regression techniques.

Digitas, Inc, Boston, MA. *Manager*, November 1999 – August 2005.

Researched, designed, and executed reporting solutions to assess the effectiveness of marketing strategies based on consumer behavior. Customized analyses to gain insight into environmental influences on marketing performance and designed and built models to predict sales/revenue and inform business economics using relational databases.

PROFESSIONAL ACTIVITIES

Wakefield Energy Conservation Committee. *Appointed Member.* 2007–2008. Assisted with issuing an RFP for energy service companies to perform energy efficiency upgrades to municipally-owned and operated buildings, reviewing responses and selecting a provider.

EDUCATION

Boston University, Boston, MA

Master of Arts in Energy and Environmental Analysis, Spring 2007. Graduate course work in multivariate statistical analysis, environmental economics, risk assessment, energy, GIS, climate change, and environmental policy.

University of Maryland, College Park, MD

Bachelor of Arts in Journalism, Spring 1999. Presidential Scholarship and Honors Program.

CONFERENCES AND MEETINGS

- *Presenter,* Synapse webinar discussing the many benefits from more stringent fuel economy standards and highlighting future transportation developments, 2018.
- *Participant,* Northeast Public Power Association Annual Conference, 2018.
- *Project partner,* Sandia National Laboratories Stakeholder Advisory Group to discuss a national path forward on resilience planning, 2018.
- *Presenter,* ACEEE Summer Study on EE in Buildings, 2016.
- *Presenter,* Synapse webinar on strategies to mitigate equity concerns of energy efficiency programs, 2015.
- *Discussant,* IEA Energy Efficiency Markets workshop, 2015.
- *Presenter,* ACI Chesapeake Regional Home Performance Conference, 2014.
- *Panelist/Presenter,* IEA Experts Roundtable on Energy Provider and Consumer Benefits of Energy Efficiency, 2013.
- *Moderator,* International Energy Program Evaluation Conference (IEPEC) – Benchmarking Program Administrator and State Level Energy Efficiency Efforts Panel, 2011.

SELECTED PUBLICATIONS

Kallay, J., A. Napoleon, K. Takahashi, E. Sinclair, T. Woolf. 2021. *Opportunities for Evergy Kansas to Address Energy Equity Within its Integrated Resource Plan and Other Planning Processes.* Synapse Energy Economics for Union of Concerned Scientists.

Kallay, J., A.S. Hopkins, C. Odom, J. Ramey, J. Stevenson, R. Broderick, R. Jeffers, B. Garcia. 2021. *The Quest for Public Purpose Microgrids for Resilience: Considerations for Regulatory Approval*. Synapse Energy Economics for Sandia National Labs.

Kallay, J., A. Napoleon, J. Hall, B. Havumaki, A. Hopkins, M. Whited, T. Woolf, J. Stevenson, R. Broderick, R. Jeffers, B. Garcia. 2021. *Regulatory Mechanisms to Enable Investments in Electric Utility Resilience*. Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., S. Letendre, T. Woolf, B. Havumaki, S. Kwok, A. Hopkins, R. Broderick, R. Jeffers, K. Jones, M. DeMenno. 2021. *Application of a Standard Approach to Benefit-Cost Analysis for Electric Grid Resilience Investments*. Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., A. Napoleon, B. Havumaki, J. Hall, C. Odom, A. Hopkins, M. Whited, T. Woolf, M. Chang, R. Broderick, R. Jeffers, B. Garcia. 2021. *Performance Metrics to Evaluate Utility Resilience Investments*. Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., A. Hopkins, A. Napoleon, B. Havumaki, J. Hall, M. Whited, M. Chang, R. Broderick, R. Jeffers, K. Jones, M. DeMenno. 2021. *The Resilience Planning Landscape for Communities and Electric Utilities*. Synapse Energy Economics for Sandia National Laboratories.

Napoleon, A., J. Hall, J. Kallay, M. Chang, P. Eash-Gates, N. L. Seidman, C. James, D. Torre, D. Brutkoski, J. Migden-Ostrander, K. Colburn, K. Maddux, D. Harlow, M. Power. 2020. *Energy Infrastructure: Sources of Inequities and Policy Solutions for Improving Community Health and Wellbeing*. Synapse Energy Economics, Regulatory Assistance Project, and Community Action Partnership for the Robert Wood Johnson Foundation.

Knight, P. J. Frost, J. Kallay, S. Letendre, J. Hall. 2020. *Assessing the Impacts Climate Change May Have on Maine's Economy, Revenues, and Investment Decisions*. Synapse Energy Economics and Eastern Research Group for the State of Maine's Department of the Governor's Office of Policy Innovation and the Future.

Napoleon, A., J. Kallay, K. Takahashi. 2020. *Utility Energy Efficiency and Building Electrification Portfolios Through 2025: A Brief on the New York Public Service Commission's Recent Order*. Synapse Energy Economics for the Natural Resources Defense Council.

Kallay, J., A. Hopkins, J. Frost, A. Napoleon, K. Takahashi, J. Slason, G. Freeman, D. Grover, B. Swanson. 2019. *Net Zero Energy Roadmap for the City of Burlington, Vermont*. Synapse Energy Economics and Resource Systems Group for Burlington Electric Department.

Napoleon, A., T. Woolf, K. Takahashi, J. Kallay, B. Havumaki. 2019. *Comments in the New York Public Service Commission Case 18-M-0084: In the Matter of a Comprehensive Energy Efficiency Initiative*. Comments related to NY Utilities report regarding energy efficiency budgets and targets, collaboration, heat pump technology, and low- and moderate-income customers and requests for approval. Prepared by Synapse Energy Economics on behalf of Natural Resources Defense Council.

Allison, A., A. Napoleon, J. Kallay. 2019. *Maine Low-Income Home Energy Burden Study*. Synapse Energy Economics for the Maine Office of the Public Advocate.

Havumaki, B., J. Kallay, K. Takahashi, T. Woolf. 2019. *All-Electric Solid Oxide Fuel Cells as an Energy Efficiency Measure*. Synapse Energy Economics for Bloom Energy.

Takahashi, K., B. Havumaki, J. Kallay, T. Woolf. 2019. *Bloom Fuel Cells: A Cost-Effectiveness Brief*. Synapse Energy Economics for Bloom Energy.

Kallay, J., A. Napoleon. 2019. Comments and Revised Comments on EfficiencyOne's Proposed Enhancements to its Rate and Bill Impact Model. Synapse Energy Economics for the Nova Scotia Utility and Review Board.

Hall, J., R. Wilson, J. Kallay. 2018. *Effects of the Draft CAFE Standard Rule on Vehicle Safety*. Synapse Energy Economics on behalf of Consumers Union.

Whited, M., J. Kallay, D. Bhandari, B. Havumaki. 2018. *Driving Transportation Electrification Forward in Pennsylvania: Considerations for Effective Transportation Electrification Ratemaking*. Synapse Energy Economics for the Natural Resources Defense Council.

Hall, J., J. Kallay, A. Napoleon, K. Takahashi, M. Whited. 2018. *Locational and Temporal Values of Energy Efficiency and other DERs to Transmission and Distribution Systems*. Synapse Energy Economics.

DOER. 2017. *Massachusetts Green Communities Program: 2016 Progress Report*.

Kallay, J., A. Napoleon, M. Chang. 2016. *Opportunities to Ramp Up Low-Income Energy Efficiency to Meet States and National Climate Policy Goals*. Synapse Energy Economics.

Napoleon, A., K. Takahashi, J. Kallay, T. Woolf. 2016. "Evaluation, Measurement, and Verification in Virginia." Synapse Energy Economics for Clean Energy Solutions Inc., Virginia Energy Efficiency Council, and Virginia Department of Mines, Minerals and Energy.

Kallay, J., K. Takahashi, A. Napoleon, T. Woolf. 2015. *Fair, Abundant, and Low-Cost: A Handbook for Using Energy Efficiency in Clean Power Plan Compliance*. Synapse Energy Economics for the Energy Foundation.

IEA. 2014. *Capturing the Multiple Benefits of Energy Efficiency*. Expert advisor on Chapter 6. Energy Delivery.

Brockway, N., J. Kallay, E. Malone. 2014. *Low-Income Assistance Strategy Review*. Synapse Energy Economics for the Ontario Energy Board.

Woolf, T., E. Malone, J. Kallay. 2014. *Rate and Bill Impacts of Vermont Energy Efficiency Programs*. Synapse Energy Economics for the Vermont Public Service Department.

Woolf T., E. Malone, J. Kallay, K. Takahashi. 2013. *Energy Efficiency Cost-Effectiveness Screening in the Northeast and Mid-Atlantic States*. Synapse Energy Economics for Northeast Energy Efficiency Partnerships, Inc. (NEEP).

Woolf T., J. Kallay, E. Malone, T. Comings, M. Schultz, J. Conyers. 2012. *Commercial & Industrial Customer Perspectives on Massachusetts Energy Efficiency Program*. Synapse Energy Economics for Massachusetts Energy Efficiency Advisory Council.

Hurley D., K. Takahashi, B. Biewald, J. Kallay, R. Maslowski. 2008. *Cost and Benefits of Electric Utility Energy Efficiency in Massachusetts*. Synapse Energy Economics for Northeast Energy Efficiency Council.

Swanson C., R. Hornby, J. Kallay. 2007. *Avoided Gas Supply Costs in New York*. Synapse Energy Economics for Keyspan Energy.

Hornby R., C. Swanson, M. Drunsic, D. White, P. Chernick, B. Biewald, J. Kallay. 2007. *Avoided Energy Supply Costs in New England: 2007 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Takahashi K., B. Biewald, L. Johnson, J. Kallay. 2007. *Greenhouse Gas Reduction Strategies of Electric and Gas Companies in North America*. Synapse Energy Economics for Tokyo Gas.

Resume updated January 2022.

Tim Woolf, Senior Vice President

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617-453-7031
twoolf@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Vice President*, 2019 – Present, *Vice President*, 2011 – 2019.

Provides expert consulting on the economic, regulatory, consumer, environmental, and public policy implications of the electricity and gas industries. The primary focus of work includes technical and economic analyses, electric power system planning, climate change strategies, energy efficiency programs and policies, renewable resources and related policies, power plant performance and economics, air quality, and many related aspects of consumer and environmental protection.

Massachusetts Department of Public Utilities, Boston, MA. *Commissioner*, 2007 – 2011.

Oversaw a significant expansion of clean energy policies as a consequence of the Massachusetts Green Communities Act, including an aggressive expansion of ratepayer-funded energy efficiency programs; the implementation of decoupled rates for electric and gas companies; an update of the DPU energy efficiency guidelines; the promulgation of net metering regulations; review of smart grid pilot programs; and review of long-term contracts for renewable power. Oversaw six rate case proceedings for Massachusetts electric and gas companies. Played an influential role in the development of price responsive demand proposals for the New England wholesale energy market. Served as President of the New England Conference of Public Utility Commissioners from 2009-2010. Served as board member on the Energy Facilities Siting Board from 2007-2010. Served as co-chair of the Steering Committee for the Northeast Energy Efficiency Partnership's Regional Evaluation, Measurement and Verification Forum.

Synapse Energy Economics Inc., Cambridge, MA. *Vice President*, 1997 – 2007.

Tellus Institute, Boston, MA. *Senior Scientist, Manager of Electricity Program*, 1992 – 1997.

Association for the Conservation of Energy, London, England. *Research Director*, 1991 – 1992.

Massachusetts Department of Public Utilities, Boston, MA. *Staff Economist*, 1989 – 1990.

Massachusetts Office of Energy Resources, Boston, MA. *Policy Analyst*, 1987 – 1989.

Energy Systems Research Group, Boston, MA. *Research Associate*, 1983 – 1987.

Union of Concerned Scientists, Cambridge, MA. *Energy Analyst*, 1982-1983.

EDUCATION

Boston University, Boston, MA

Master of Business Administration, 1993

London School of Economics, London, England

Diploma, Economics, 1991

Tufts University, Medford, MA

Bachelor of Science in Mechanical Engineering,
1982

Tufts University, Medford, MA

Bachelor of Arts in English, 1982

REPORTS

Malone, E., D. Goldberg, S. Kwok, T. Woolf. 2022. *The Cape Light Compact's Low-Income Energy Efficiency Programs: Challenges and Opportunities*. Synapse Energy Economics for The Cape Light Compact.

Kallay, J., A. Napoleon, K. Takahashi, E. Sinclair, T. Woolf. 2021. *Opportunities for Evergy Kansas to Address Energy Equity Within its Integrated Resource Plan and Other Planning Processes*. Synapse Energy Economics for Union of Concerned Scientists.

Takahashi, K., T. Woolf, B. Havumaki, D. White, D. Goldberg, S. Kwok, A. Takasugi. 2021. *Missed Opportunities: The Impacts of Recent Policies on Energy Efficiency Programs in Midwestern States*. Synapse Energy Economics for the Midwest Energy Efficiency Alliance.

Liburd, S., E. Sinclair, T. Woolf, C. Roberto. 2021. *Hosting Capacity Analysis and Distribution Grid Data Security*. Synapse Energy Economics for the Northern Plains Resource Council.

Kallay, J., A. Napoleon, B. Havumaki, J. Hall, C. Odom, A. Hopkins, M. Whited, T. Woolf, M. Chang, R. Broderick, R. Jeffers, B. Garcia. 2021. *Performance Metrics to Evaluate Utility Resilience Investments*. Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., S. Letendre, T. Woolf, B. Havumaki, S. Kwok, A. Hopkins, R. Broderick, R. Jeffers, K. Jones, M. DeMenno. 2021. *Application of a Standard Approach to Benefit-Cost Analysis for Electric Grid Resilience Investments*. Synapse Energy Economics for Sandia National Laboratories.

Woolf, T., B. Havumaki, S. Letendre, C. Odom, J. Hall. 2021. *Macroeconomic Impacts of the Rhode Island Community Remote Net Metering Program*. Synapse Energy Economics for the Rhode Island Division of Public Utilities and Carriers.

Woolf, T., D. Bhandari, C. Lane, J. Frost, B. Havumaki, S. Letendre, C. Odom. 2021. *Benefit-Cost Analysis of the Rhode Island Community Remote Net Metering Program*. Synapse Energy Economics for the Rhode Island Division of Public Utilities and Carriers.

Woolf, T., L. Schwartz, B. Havumaki, D. Bhandari, M. Whited. 2021. *Benefit-Cost Analysis for Utility-Facing Grid Modernization Investments: Trends, Challenges, and Considerations*. Prepared by Lawrence

Berkeley National Laboratory and Synapse Energy Economics for the Grid Modernization Laboratory Consortium of the U.S. Department of Energy.

National Energy Screening Project. 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance.

Glick, D., D. Bhandari, C. Roberto, T. Woolf. 2020. *Review of benefit-cost analysis for the EPA's proposed revisions to the 2015 Steam Electric Limitations Guidelines*. Synapse Energy Economics for Earthjustice and Environmental Integrity Project.

Knight, P., E. Camp, D. Bhandari, J. Hall, M. Whited, B. Havumaki, A. Allison, N. Peluso, T. Woolf. 2019. *Making Electric Vehicles Work for Utility Customers: A Policy Handbook for Consumer Advocates*. Synapse Energy Economics for the Energy Foundation.

Napoleon, A., B. Havumaki, D. Bhandari, T. Woolf. 2019. *Review of New Brunswick Power's Application for Approval of an Advanced Metering Infrastructure Capital Project: In the Matter of the New Brunswick Power Corporation and Section 107 of the Electricity Act; Matter No. 452*. Synapse Energy Economics for the New Brunswick Energy and Utilities Board Staff.

Malone, E., T. Woolf, S. Letendre. 2019. *New Hampshire Cost-Effectiveness Review: Application of the National Standard Practice Manual to New Hampshire*. Synapse Energy Economics for the New Hampshire Evaluation, Measurement, and Verification Working Group.

Havumaki, B., J. Kallay, K. Takahashi, T. Woolf. 2019. *All-Electric Solid Oxide Fuel Cells as an Energy Efficiency Measure*. Synapse Energy Economics for Bloom Energy.

Takahashi, K., B. Havumaki, J. Kallay, T. Woolf. 2019. *Bloom Fuel Cells: A Cost-Effectiveness Brief*. Synapse Energy Economics for Bloom Energy.

Napoleon, A., D. Goldberg, K. Takahashi, T. Woolf. 2019. *An Assessment of Prince Edward Island Energy Corporations' 2018 - 2021 Energy Efficiency and Conservation Plan*. Synapse Energy Economics for Carr, Stevenson and MacKay as Counsel to the Island Regulatory and Appeals Commission.

Camp, E., B. Fagan, J. Frost, D. Glick, A. Hopkins, A. Napoleon, N. Peluso, K. Takahashi, D. White, R. Wilson, T. Woolf. 2018. *Phase 1 Findings on Muskrat Falls Project Rate Mitigation*. Synapse Energy Economics for Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Malone, E., T. Woolf, D. Goldberg. 2018. *Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota*. Conservation Applied Research and Development (CARD) Report. Synapse Energy Economics for Minnesota Department of Commerce, Division of Energy Resources.

White, D., K. Takahashi, A. Napoleon, T. Woolf. 2018. *Value of Energy Efficiency in New York: Assessment of the Range of Benefits of Energy Efficiency Programs*. Synapse Energy Economics for Natural Resources Defense Council.

Fisher, J., M. Whited, T. Woolf, D. Goldberg. 2018. *Utility Investments for Market Transformation: How Utilities Can Help Achieve Energy Policy Goals*. Synapse Energy Economics for Energy Foundation.

Woolf, T., A. Hopkins, M. Whited, K. Takahashi, A. Napoleon. 2018. *Review of New Brunswick Power's 2018/2019 Rate Case Application*. In the Matter of the New Brunswick Power Corporation and Section 103(1) of the Electricity Act Matter No. 375. Synapse Energy Economics for the New Brunswick Energy and Utilities Board Staff.

Woolf, T., C. Neme, M. Kushler, S. R. Schiller, T. Eckman. 2017. *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*. Edition 1, Spring 2017. Prepared by the National Efficiency Screening Project.

Whited, M., A. Horowitz, T. Vitolo, W. Ong, T. Woolf. 2017. *Distributed Solar in the District of Columbia: Policy Options, Potential, Value of Solar, and Cost-Shifting*. Synapse Energy Economics for the Office of the People's Counsel for the District of Columbia.

Raab Associates and Synapse Energy Economics. 2017. *Grid Modernization in New Hampshire: Report to the New Hampshire Public Utilities Commission*. Prepared by the New Hampshire Grid Modernization Working Group. March 20, 2017.

Woolf, T. 2016. *Expert Report: Rate Mechanism, Reconciliation of Provisional Rates, Energy Efficiency Rider*. Prepared for Puerto Rico Energy Commission regarding Matter No. CEPR-AP-2015-0001, November 21, 2016.

Woolf, T., M. Whited, P. Knight, T. Vitolo, K. Takahashi. 2016. *Show Me the Numbers: A Framework for Balanced Distributed Solar Policies*. Synapse Energy Economics for Consumers Union.

Fisher, J., A. Horowitz, J. Migden-Ostrander, T. Woolf. 2016. *Puerto Rico Electric Power Authority's 2015 Integrated Resource Plan*. Synapse Energy Economics for Puerto Rico Energy Commission.

Woolf, T., A. Napoleon, P. Luckow, W. Ong, K. Takahashi. 2016. *Aiming Higher: Realizing the Full Potential of Cost-Effective Energy Efficiency in New York*. Synapse Energy Economics for Natural Resources Defense Council, E4TheFuture, CLEAResult, Lime Energy, Association for Energy Affordability, and Alliance for Clean Energy New York.

Lowry, M. N., T. Woolf, M. Whited, M. Makos. 2016. *Performance-Based Regulation in a High Distributed Energy Resources Future*. Pacific Economics Group Research and Synapse Energy Economics for Lawrence Berkley National Laboratory.

Woolf, T., M. Whited, A. Napoleon. 2015-2016. *Comments and Reply Comments in the New York Public Service Commission Case 14-M-0101: Reforming the Energy Vision*. Comments related to Staff's (a) a benefit-costs analysis framework white paper, (b) ratemaking and utility business models white paper, and (c) Distributed System Implementation Plan guide. Synapse Energy Economics on behalf of Natural Resources Defense Council and Pace Energy and Climate Center. August 21, 2015, September 10, 2015, October 26, 2015, November 23, 2015, December 7, 2015, and January 6, 2016.

Kallay, J., K. Takahashi, A. Napoleon, T. Woolf. 2015. *Fair, Abundant, and Low-Cost: A Handbook for Using Energy Efficiency in Clean Power Plan Compliance*. Synapse Energy Economics for the Energy Foundation.

Woolf, T., K. Takahashi, E. Malone, A. Napoleon, J. Kallay. 2015. *Ontario Gas Demand-Side Management 2016-2020 Plan Review*. Synapse Energy Economics for the Ontario Energy Board.

Whited, M., T. Woolf, A. Napoleon. 2015. *Utility Performance Incentive Mechanisms: A Handbook for Regulators*. Synapse Energy Economics for the Western Interstate Energy Board.

Woolf, T., E. Malone, F. Ackerman. 2014. *Cost-Effectiveness Screening Principles and Guidelines for Alignment with Policy Goals, Non-Energy Impacts, Discount Rates, and Environmental Compliance Costs*. Synapse Energy Economics for Northeast Energy Efficiency Partnerships (NEEP) Regional Evaluation, Measurement and Verification Forum.

Woolf, T., E. Malone, C. Neme. 2014. *Regulatory Policies to Support Energy Efficiency in Virginia*. Synapse Energy Economics and Energy Futures Group for the Virginia Energy Efficiency Council.

Woolf, T., M. Whited, E. Malone, T. Vitolo, R. Hornby. 2014. *Benefit-Cost Analysis for Distributed Energy Resources: A Framework for Accounting for All Relevant Costs and Benefits*. Synapse Energy Economics for the Advanced Energy Economy Institute.

Woolf, T., E. Malone, J. Kallay. 2014. *Rate and Bill Impacts of Vermont Energy Efficiency Programs*. Synapse Energy Economics for the Vermont Public Service Department.

Woolf, T., C. Neme, P. Stanton, R. LeBaron, K. Saul-Rinaldi, S. Cowell. 2014. *The Resource Value Framework: Reforming Energy Efficiency Cost-Effectiveness Screening*. The National Efficiency Screening Project for the National Home Performance Council.

Malone, E., T. Woolf, K. Takahashi, S. Fields. 2013. "Appendix D: Energy Efficiency Cost-Effectiveness Tests." *Readying Michigan to Make Good Energy Decisions: Energy Efficiency*. Synapse Energy Economics for the Council of Michigan Foundations.

Stanton, E. A., S. Jackson, G. Keith, E. Malone, D. White, T. Woolf. 2013. *A Clean Energy Standard for Massachusetts*. Synapse Energy Economics for the Massachusetts Clean Energy Center and the Massachusetts Departments of Energy Resources, Environmental Protection, and Public Utilities.

Woolf, T., K. Saul-Rinaldi, R. LeBaron, S. Cowell, P. Stanton. 2013. *Recommendations for Reforming Energy Efficiency Cost-Effectiveness Screening in the United States*. Energy Efficiency Screening Coalition for the National Home Performance Council.

Woolf, T., E. Malone, J. Kallay, K. Takahashi. 2013. *Energy Efficiency Cost-Effectiveness Screening in the Northeast and Mid-Atlantic States*. Synapse Energy Economics for Northeast Energy Efficiency Partnerships, Inc. (NEEP).

Raab Associates and Synapse Energy Economics. 2013. *Massachusetts Electric Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee*. Prepared for the Massachusetts Department of Public Utilities. DPU 12-76.

Jackson, S., P. Peterson, D. Hurley, T. Woolf. 2013. *Forecasting Distributed Generation Resources in New England: Distributed Generation Must Be Properly Accounted for in Regional System Planning*. Synapse Energy Economics for E4 Group.

Woolf, T., E. Malone, L. Schwartz, J. Shenot. 2013. *A Framework for Evaluating the Cost-Effectiveness of Demand Response*. Synapse Energy Economics and Regulatory Assistance Project for the National Forum on the National Action Plan on Demand Response: Cost-effectiveness Working Group.

Woolf, T., W. Steinhurst, E. Malone, K. Takahashi. 2012. *Energy Efficiency Cost-Effectiveness Screening: How to Properly Account for 'Other Program Impacts' and Environmental Compliance Costs*. Synapse Energy Economics for Regulatory Assistance Project and Vermont Housing Conservation Board.

Woolf, T., M. Whited, T. Vitolo, K. Takahashi, D. White. 2012. *Indian Point Replacement Analysis: A Clean Energy Roadmap. A Proposal for Replacing the Nuclear Plant with Clean, Sustainable Energy Resource*. Synapse Energy Economics for Natural Resources Defense Council (NRDC) and Riverkeeper.

Keith, G., T. Woolf, K. Takahashi. 2012. *A Clean Electricity Vision for Long Island: Supplying 100% of Long Island's Electricity Needs with Renewable Power*. Synapse Energy Economics for Renewable Energy Long Island.

Woolf, T. 2012. *Best Practices in Energy Efficiency Program Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For*. Synapse Energy Economics for National Home Performance Council.

Woolf, T., J. Kallay, E. Malone, T. Comings, M. Schultz, J. Conyers. 2012. *Commercial & Industrial Customer Perspectives on Massachusetts Energy Efficiency Programs*. Synapse Energy Economics for the Massachusetts Energy Efficiency Advisory Council.

Woolf, T., M. Wittenstein, R. Fagan. 2011. *Indian Point Energy Center Nuclear Plant Retirement Analysis*. Synapse Energy Economics for Natural Resources Defense Council (NRDC) and Riverkeeper.

Woolf, T., V. Sabodash, B. Biewald. 2011. *Equipment Price Forecasting in Energy Conservation Standards Analysis*. Synapse Energy Economics for Appliance Standards Awareness Project and Natural Resources Defense Council (NRDC).

Johnston, L., E. Hausman, A. Sommer, B. Biewald, T. Woolf, D. Schlissel, A. Rochelle, D. White. 2007. *Climate Change and Power: Carbon Dioxide Emission Costs and Electricity Resource Planning*. Synapse Energy Economics for Tallahassee Electric Utility.

Woolf, T. 2007. *Cape Light Compact Energy Efficiency Plan 2007-2012: Providing Comprehensive Energy Efficiency Services to Communities on Cape Cod and Martha's Vineyard*. Synapse Energy Economics for the Cape Light Compact.

Woolf, T. 2007. *Review of the District of Columbia Reliable Energy Trust Fund and Natural Gas Trust Fund Working Group and Regulatory Processes*. Synapse Energy Economics for the District of Columbia Office of People's Counsel.

Woolf, T. 2006. *Cape Light Compact Annual Report on Energy Efficiency Activities in 2005*. Synapse Energy Economics for the Cape Light Compact, submitted to the Massachusetts Department of Telecommunications and Energy and the Massachusetts Division of Energy Resources.

Steinhurst, W., T. Woolf, A. Sommer, K. Takahashi, P. Chernick, J. Wallach. 2006. *Integrated Portfolio Management in a Restructured Supply Market*. Synapse Energy Economics and Resource Insight for the Ohio Office of Consumer Counsel.

Peterson, P., D. Hurley, T. Woolf, B. Biewald. 2006. *Incorporating Energy Efficiency into the ISO-New England Forward Capacity Market*. Synapse Energy Economics for Conservation Services Group.

Woolf, T., D. White, C. Chen, A. Sommer. 2005. *Potential Cost Impacts of a Renewable Portfolio Standard in New Brunswick*. Synapse Energy Economics for New Brunswick Department of Energy.

Woolf, T., K. Takahashi, G. Keith, A. Rochelle, P. Lyons. 2005. *Feasibility Study of Alternative Energy and Advanced Energy Efficiency Technologies for Low-Income Housing in Massachusetts*. Synapse Energy Economics and Zapotec Energy for the Low-Income Affordability Network, Action for Boston Community Development, and Action Inc.

Woolf, T. 2005. *The Cape Light Compact Energy Efficiency Plan: Phase III 2005-2007: Providing Comprehensive Energy Efficiency Services to Communities on Cape Cod and Martha's Vineyard*. Synapse Energy Economics for the Cape Light Compact.

Woolf, T. 2004. *Review of Avoided Costs Used in Minnesota Electric Utility Conservation Improvement Programs*. Synapse Energy Economics for the Minnesota Office of Legislative Auditor.

Woolf, T. 2004. *NEEP Strategic Initiative Review: Qualitative Assessment and Initiative Ranking for the Residential Sector*. Synapse Energy Economics for Northeast Energy Efficiency Partnerships, Inc.

Woolf, T. 2004. *A Balanced Energy Plan for the Interior West*. Synapse Energy Economics, West Resource Advocates, and Tellus Institute for the Hewlett Foundation Energy Series.

Steinhurst, W., P. Chernick, T. Woolf, J. Plunkett, C. Chen. 2003. *OCC Comments on Alternative Transitional Standard Offer*. Synapse Energy Economics for the Connecticut Office of Consumer Counsel.

Woolf, T. 2003. *Potential Cost Impacts of a Vermont Renewable Portfolio Standard*. Synapse Energy Economics for Vermont Public Service Board, presented to the Vermont RPS Collaborative.

Biewald, B., T. Woolf, A. Rochelle, W. Steinhurst. 2003. *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. Synapse Energy Economics for Regulatory Assistance Project and Energy Foundation.

Woolf, T., G. Keith, D. White, M. Drunisc, M. Ramiro, J. Ramey, J. Levy, P. Kinney, S. Greco, K. Knowlton, B. Ketcham, C. Komanoff, D. Gutman. 2003. *Air Quality in Queens: Cleaning Up the Air in Queens County and Neighboring Regions*. Synapse Energy Economics, Konheim & Ketcham, and Komanoff Energy Associates for Natural Resources Defense Council (NRDC), Keyspan Energy, and the Coalition Helping to Organize a Kleaner Environment.

Chen, C., D. White, T. Woolf, L. Johnston. 2003. *The Maryland Renewable Portfolio Standard: An Assessment of Potential Cost Impacts*. Synapse Energy Economics for the Maryland Public Interest Research Group.

Woolf, T. 2003. *The Cape Light Compact Energy Efficiency Plan: Phase II 2003 – 2007: Providing Comprehensive Energy Efficiency Services to Communities on Cape Cod and Martha's Vineyard*. Synapse Energy Economics, Cort Richardson, Vermont Energy Investment Corporation, and Optimal Energy Incorporated for the Cape Light Compact.

Woolf, T. 2002. *Green Power and Energy Efficiency Opportunities for Municipalities in Massachusetts: Promoting Community Involvement in Energy and Environmental Decisions*. Synapse Energy Economics for the Massachusetts Energy Consumers Alliance.

Woolf, T. 2002. *The Energy Efficiency Potential in Williamson County, Tennessee: Opportunities for Reducing the Need for Transmission Expansion*. Synapse Energy Economics for the Harpeth River Watershed Association and the Southern Alliance for Clean Energy.

Woolf, T. 2002. *Electricity Restructuring Activities in the US: A Survey of Selected States*. Synapse Energy Economics for Arizona Corporation Commission Utilities Division Staff.

Woolf, T. 2002. *Powering the South: A Clean and Affordable Energy Plan for the Southern United States*. Synapse Energy Economics with and for the Renewable Energy Policy Project and a coalition of Southern environmental advocates.

Johnston, L., G. Keith, T. Woolf, B. Biewald, E. Gonin. 2002. *Survey of Clean Power and Energy Efficiency Programs*. Synapse Energy Economics for the Ozone Transport Commission.

Woolf, T. 2001. *Proposal for a Renewable Portfolio Standard for New Brunswick*. Synapse Energy Economics for the Conservation Council of New Brunswick, presented to the New Brunswick Market Design Committee.

Woolf, T., G. Keith, D. White, F. Ackerman. 2001. *A Retrospective Review of FERC's Environmental Impact Statement on Open Transmission Access*. Synapse Energy Economics and the Global Development and Environmental Institute for the North American Commission for Environmental Cooperation, with the Global Development and Environment Institute.

Woolf, T. 2001. *Repowering the Midwest: The Clean Energy Development Plan for the Heartland*. Synapse Energy Economics for the Environmental Law and Policy Center and a coalition of Midwest environmental advocates.

Woolf, T. 2000. *The Cape Light Compact Energy Efficiency Plan: Providing Comprehensive Energy Efficiency Services to Communities on Cape Cod and Martha's Vineyard*. Synapse Energy Economics for the Cape Light Compact.

Woolf, T., B. Biewald. 1999. *Market Distortions Associated With Inconsistent Air Quality Regulations*. Synapse Energy Economics for the Project for a Sustainable FERC Energy Policy.

Woolf, T., B. Biewald, D. Glover. 1998. *Competition and Market Power in the Northern Maine Electricity Market*. Synapse Energy Economics and Failure Exponent Analysis for the Maine Public Utilities Commission.

Woolf, T. 1998. *New England Tracking System*. Synapse Energy Economics for the New England Governors' Conference, with Environmental Futures and Tellus Institute.

Woolf, T., D. White, B. Biewald, W. Moomaw. 1998. *The Role of Ozone Transport in Reaching Attainment in the Northeast: Opportunities, Equity and Economics*. Synapse Energy Economics and the Global Development and Environment Institute for the Northeast States for Coordinated Air Use Management.

Biewald, B., D. White, T. Woolf, F. Ackerman, W. Moomaw. 1998. *Grandfathering and Environmental Comparability: An Economic Analysis of Air Emission Regulations and Electricity Market Distortions*. Synapse Energy Economics and the Global Development and Environment Institute for the National Association of Regulatory Utility Commissioners.

Biewald, B., T. Woolf, P. Bradford, P. Chernick, S. Geller, J. Oppenheim. 1997. *Performance-Based Regulation in a Restructured Electric Industry*. Synapse Energy Economics, Resource Insight, and the National Consumer Law Center for the National Association of Regulatory Utility Commissioners.

Biewald, B., T. Woolf, M. Breslow. 1997. *Massachusetts Electric Utility Stranded Costs: Potential Magnitude, Public Policy Options, and Impacts on the Massachusetts Economy*. Synapse Energy Economics for the Union of Concerned Scientists, MASSPIRG, and Public Citizen.

Woolf, T. 1997. *The Delaware Public Service Commission Staff's Report on Restructuring the Electricity Industry in Delaware*. Tellus Institute for The Delaware Public Service Commission Staff. Tellus Study No. 96-99.

Woolf, T. 1997. *Preserving Public Interest Obligations Through Customer Aggregation: A Summary of Options for Aggregating Customers in a Restructured Electricity Industry*. Tellus Institute for The Colorado Office of Energy Conservation. Tellus Study No. 96-130.

Woolf, T. 1997. *Zero Carbon Electricity: the Essential Role of Efficiency and Renewables in New England's Electricity Mix*. Tellus Institute for The Boston Edison Settlement Board. Tellus Study No. 94-273.

Woolf, T. 1997. *Regulatory and Legislative Policies to Promote Renewable Resources in a Competitive Electricity Industry*. Tellus Institute for The Colorado Governor's Office of Energy Conservation. Tellus Study No. 96-130-A5.

Woolf, T. 1996. *Can We Get There From Here? The Challenge of Restructuring the Electricity Industry So That All Can Benefit*. Tellus Institute for The California Utility Consumers' Action Network. Tellus Study No. 95-208.

Woolf, T. 1995. *Promoting Environmental Quality in a Restructured Electric Industry*. Tellus Institute for The National Association of Regulatory Utility Commissioners. Tellus Study No. 95-056.

Woolf, T. 1995. *Systems Benefits Funding Options*. Tellus Institute for Wisconsin Environmental Decade. Tellus Study No. 95-248.

Woolf, T. 1995. *Non-Price Benefits of BECO Demand-Side Management Programs*. Tellus Institute for Boston Edison Settlement Board. Tellus Study No. 93-174.

Woolf, T., B. Biewald. 1995. *Electric Resource Planning for Sustainability*. Tellus Institute for the Texas Sustainable Energy Development Council. Tellus Study No. 94-114.

TESTIMONY

Public Utilities Commission of New Hampshire (Docket No. DE 20-161): Direct Testimony of Tim Woolf and Ben Havumaki regarding Eversource's 2020 least-cost integrated resource plan. On behalf of the Office of the Consumer Advocate. August 19, 2022.

Colorado Public Utilities Commission (Proceeding No. 19AL-0687E): Cross-answer testimony and attachments of Tim Woolf regarding the need for a customer opt-out provision in Public Service Company of Colorado's proposed TOU rates plan. On behalf of Energy Outreach Colorado. May 21, 2020.

Colorado Public Utilities Commission (Proceeding No. 19AL-0687E): Answer testimony and attachments of Tim Woolf regarding Public Service Company of Colorado's proposal to establish mandatory Modified RE-TOU rates for residential customers. On behalf of Energy Outreach Colorado. April 24, 2020.

New York Public Service Commission (Cases 19-E-0065 and 19-G-0066): Direct testimony of Tim Woolf and Alice Napoleon regarding energy efficiency targets and incentives in Con Edison rate case. On behalf of the Natural Resources Defense Council. May 24, 2019.

Virginia State Corporation Commission (Case No. PUR-2018-00168): Direct testimony of Tim Woolf and Erin Malone regarding Virginia Electric and Power Company's application for approval to implement demand-side management programs and for approval of two updated rate adjustment clauses. On behalf of the Sierra Club. February 6, 2019.

Rhode Island Public Utilities Commission (Docket No. 4780): Direct testimony of Tim Woolf and Melissa Whited regarding National Grid's Power Sector Transformation proposals. On behalf of the Rhode Island Division of Public Utilities and Carriers. April 28, 2018.

Rhode Island Public Utilities Commission (Docket No. 4770): Direct testimony of Tim Woolf regarding National Grid's rate case. On behalf of the Rhode Island Division of Public Utilities and Carriers. April 6, 2018.

Rhode Island Public Utilities Commission (Docket No. 4770): Direct testimony of Tim Woolf and Melissa Whited regarding National Grid's proposed performance incentive mechanisms, benefit-cost analyses, and request for recovery of costs for its Advanced Metering Functionality study and distributed energy resources enablement investments. On behalf of the Rhode Island Division of Public Utilities and Carriers. April 6, 2018.

Rhode Island Public Utilities Commission (Docket No. 4783): Direct testimony of Tim Woolf and Melissa Whited regarding National Grid's Advanced Metering Functionality Pilot. On behalf of the Rhode Island Division of Public Utilities and Carriers. February 22, 2018.

New York Public Service Commission (Case 17-E-0459): Direct testimony of Tim Woolf regarding Energy Efficiency Earnings Adjustment Mechanisms proposed by Central Hudson Gas & Electric Company. On behalf of Natural Resources Defense Council. November 21, 2017.

New York Public Service Commission (Case 17-E-0238): Direct and rebuttal testimony of Tim Woolf and Melissa Whited regarding Earnings Adjustment Mechanisms proposed by National Grid. On behalf of Advanced Energy Economy Institute. August 25 and September 15, 2017.

Utah Public Service Commission (Docket No. 14-035-114): Direct and rebuttal testimony of Tim Woolf regarding the PacifiCorp's analysis of the benefits and costs associated with distributed generation resources. On behalf of Utah Clean Energy. June 8, 2017 and July 25, 2017.

Massachusetts Department of Public Utilities (D.P.U. 17-05): Direct and surrebuttal testimony of Tim Woolf and Melissa Whited regarding performance-based regulation, the monthly minimum reliability contribution, storage pilots, and rate design in Eversource's petition for approval of rate increases and a performance-based ratemaking mechanism. On behalf of Sunrun and the Energy Freedom Coalition of America, LLC. April 28, 2017 and May 26, 2017.

Massachusetts Department of Public Utilities (D.P.U. 15-120, D.P.U. 15-121, D.P.U. 15-122/15-123): Direct testimony of Tim Woolf and Ariel Horowitz, PhD, regarding the petitions by National Grid, Unitil, NSTAR, and Eversource Energy for approval of their grid modernization plans. On behalf of Conservation Law Foundation. March 10, 2017.

Massachusetts Department of Public (D.P.U. 16-169): Direct testimony of Tim Woolf and Erin Malone regarding Nation Grid's petition for ruling regarding the provision of gas energy efficiency services. On behalf of the Cape Light Compact. November 2, 2016.

New Jersey Board of Public Utilities (Docket No. ER16060524): Direct testimony regarding Rockland Electric Company's proposed advanced metering program. On behalf of the New Jersey Division of Rate Counsel. September 9, 2016.

Colorado Public Utilities Commission (Proceeding No. 16AL-0048E): Answer testimony regarding Public Service Company of Colorado's rate design proposal. On behalf of Energy Outreach Colorado. June 6, 2016.

Georgia Public Service Commission (Docket No. 40161 and Docket No. 40162): Direct testimony regarding the demand-side management programs proposed by Georgia Power Company in its Certification, Decertification, and Amended Demand-Side Management Plan and its 2016 Integrated Resource Plan. On behalf of Sierra Club. May 3, 2016.

Massachusetts Department of Public Utilities (Docket No. 15-155): Joint direct and rebuttal testimony with M. Whited regarding National Grid's rate design proposal. On behalf of Energy Freedom Coalition of America, LLC. March 18, 2016 and April 28, 2016.

Maine Public Utilities Commission (Docket No. 2015-00175): Direct testimony on Efficiency Maine Trust's petition for approval of the Triennial Plan for Fiscal Years 2017-2019. On behalf of the Natural Resources Council of Maine and the Conservation Law Foundation. February 17, 2016.

Nevada Public Utilities Commission (Docket Nos. 15-07041 and 15-07042): Direct testimony on NV Energy's application for approval of a cost of service study and net metering tariffs. On behalf of The Alliance for Solar Choice. October 27, 2015.

New Jersey Board of Public Utilities (Docket No. ER14030250): Direct testimony on Rockland Electric Company's petition for investments in advanced metering infrastructure. On behalf of the New Jersey Division of Rate Counsel. September 4, 2015.

Utah Public Service Commission (Docket No. 14-035-114): Direct, rebuttal, and surrebuttal testimony on the benefit-cost framework for net energy metering. On behalf of Utah Clean Energy, the Alliance for Solar Choice, and Sierra Club. July 30, 2015, September 9, 2015, and September 29, 2015.

Nova Scotia Utility and Review Board (Matter No. M06733): Direct testimony on EfficiencyOne's 2016-2018 demand-side management plan. On behalf of the Nova Scotia Utility and Review Board. June 2, 2015.

Missouri Public Service Commission (Case No. ER-2014-0370): Direct and surrebuttal testimony on the topic of Kansas City Power and Light's rate design proposal. On behalf of Sierra Club. April 16, 2015 and June 5, 2015.

Missouri Public Service Commission (File No. EO-2015-0055): Rebuttal and surrebuttal testimony on the topic of Ameren Missouri's 2016-2018 Energy Efficiency Plan. On behalf of Sierra Club. March 20, 2015 and April 27, 2015.

Florida Public Service Commission (Dockets No. 130199-EI et al.): Direct testimony on the topic of setting goals for increasing the efficiency of energy consumption and increasing the development of demand-side renewable energy systems. On behalf of the Sierra Club. May 19, 2014.

Massachusetts Department of Public Utilities (Docket No. DPU 14-86): Direct and rebuttal Testimony regarding the cost of compliance with the Global Warming Solution Act. On behalf of the Massachusetts Department of Energy Resources and the Department of Environmental Protection. May 16, 2014.

Kentucky Public Service Commission (Case No. 2014-00003): Direct testimony regarding Louisville Gas and Electric Company and Kentucky Utilities Company's proposed 2015-2018 demand-side management and energy efficiency program plan. On behalf of Wallace McMullen and the Sierra Club. April 14, 2014.

Maine Public Utilities Commission (Docket No. 2013-168): Direct and surrebuttal testimony regarding policy issues raised by Central Maine Power's 2014 Alternative Rate Plan, including recovery of capital costs, a Revenue Index Mechanism proposal, and decoupling. On behalf of the Maine Public Advocate Office. December 12, 2013 and March 21, 2014.

Colorado Public Utilities Commission (Docket No. 13A-0686EG): Answer and surrebuttal testimony regarding Public Service Company of Colorado's proposed energy savings goals. On behalf of the Sierra Club. October 16, 2013 and January 21, 2014.

Kentucky Public Service Commission (Case No. 2012-00578): Direct testimony regarding Kentucky Power Company's economic analysis of the Mitchell Generating Station purchase. On behalf of the Sierra Club. April 1, 2013.

Nova Scotia Utility and Review Board (Matter No. M04819): Direct testimony regarding Efficiency Nova Scotia Corporation's Electricity Demand Side Management Plan for 2013 – 2015. On behalf of the Counsel to Nova Scotia Utility and Review Board. May 22, 2012.

Missouri Office of Public Counsel (Docket No. EO-2011-0271): Rebuttal testimony regarding IRP rule compliance. On behalf of the Missouri Office of the Public Counsel. October 28, 2011.

Nova Scotia Utility and Review Board (Matter No. M03669): Direct testimony regarding Efficiency Nova Scotia Corporation's Electricity Demand Side Management Plan for 2012. On behalf of the Counsel to Nova Scotia Utility and Review Board. April 8, 2011.

Rhode Island Public Utilities Commission (Docket No. 3790): Direct testimony regarding National Grid's Gas Energy Efficiency Programs. On behalf of the Division of Public Utilities and Carriers. April 2, 2007.

North Carolina Utilities Commission (Docket E-100, Sub 110): Filed comments with Anna Sommer regarding the Potential for Energy Efficiency Resources to Meet the Demand for Electricity in North Carolina. Synapse Energy Economics on behalf of the Southern Alliance for Clean Energy. February 2007.

Rhode Island Public Utilities Commission (Docket No. 3765): Direct and Surrebuttal testimony regarding National Grid's Renewable Energy Standard Procurement Plan. On behalf of the Division of Public Utilities and Carriers. January 17, 2007 and February 20, 2007.

Minnesota Public Utilities Commission (Docket Nos. CN-05-619 and TR-05-1275): Direct testimony regarding the potential for energy efficiency as an alternative to the proposed Big Stone II coal project.

On behalf of the Minnesota Center for Environmental Advocacy, Fresh Energy, Izaak Walton League of America, Wind on the Wires and the Union of Concerned Scientists. November 29, 2006.

Rhode Island Public Utilities Commission (Docket No. 3779): Oral testimony regarding the settlement of Narragansett Electric Company's 2007 Demand-Side Management Programs. On behalf of the Division of Public Utilities and Carriers. November 24, 2006.

Nevada Public Utilities Commission (Docket Nos. 06-04002 & 06-04005): Direct testimony regarding Nevada Power Company's and Sierra Pacific Power Company's Renewable Portfolio Standard Annual Report. On behalf of the Nevada Bureau of Consumer Protection. October 26, 2006

Nevada Public Utilities Commission (Docket No. 06-06051): Direct testimony regarding Nevada Power Company's Demand-Side Management Plan in the 2006 Integrated Resource Plan. On behalf of the Nevada Bureau of Consumer Protection. September 13, 2006.

Nevada Public Utilities Commission (Docket Nos. 06-03038 & 06-04018): Direct testimony regarding the Nevada Power Company's and Sierra Pacific Power Company's Demand-Side Management Plans. On behalf of the Nevada Bureau of Consumer Protection. June 20, 2006.

Nevada Public Utilities Commission (Docket No. 05-10021): Direct testimony regarding the Sierra Pacific Power Company's Gas Demand-Side Management Plan. On behalf of the Nevada Bureau of Consumer Protection. February 22, 2006.

South Dakota Public Utilities Commission (Docket No. EL04-016): Direct testimony regarding the avoided costs of the Java Wind Project. On behalf of the South Dakota Public Utilities Commission Staff. February 18, 2005.

Rhode Island Public Utilities Commission (Docket No. 3635): Oral testimony regarding the settlement of Narragansett Electric Company's 2005 Demand-Side Management Programs. On behalf of the Division of Public Utilities and Carriers. November 29, 2004.

British Columbia Utilities Commission. Direct testimony regarding the Power Smart programs contained in BC Hydro's Revenue Requirement Application 2004/05 and 2005/06. On behalf of the Sierra Club of Canada, BC Chapter. April 20, 2004.

Maryland Public Utilities Commission (Case No. 8973): Oral testimony regarding proposals for the PJM Generation Attributes Tracking System. On behalf of the Maryland Office of People's Counsel. December 3, 2003.

Rhode Island Public Utilities Commission (Docket No. 3463): Oral testimony regarding the settlement of Narragansett Electric Company's 2004 Demand-Side Management Programs. On behalf of the Division of Public Utilities and Carriers. November 21, 2003.

California Public Utilities Commission (Rulemaking 01-10-024): Direct testimony regarding the market price benchmark for the California renewable portfolio standard. On behalf of the Union of Concerned Scientists. April 1, 2003.

Québec Régie de l'énergie (Docket R-3473-01): Direct testimony with Philp Raphals regarding Hydro-Québec's Energy Efficiency Plan: 2003-2006. On behalf of Regroupement national des Conseils régionaux de l'environnement du Québec. February 5, 2003.

Connecticut Department of Public Utility Control (Docket No. 01-10-10): Direct testimony regarding the United Illuminating Company's service quality performance standards in their performance-based ratemaking mechanism. On behalf of the Connecticut Office of Consumer Counsel. April 2, 2002.

Nevada Public Utilities Commission (Docket No. 01-7016): Direct testimony regarding the Nevada Power Company's Demand-Side Management Plan. On behalf of the Bureau of Consumer Protection, Office of the Attorney General. September 26, 2001.

United States Department of Energy (Docket Number-EE-RM-500): Comments with Bruce Biewald, Daniel Allen, David White, and Lucy Johnston of Synapse Energy Economics regarding the Department of Energy's proposed rules for efficiency standards for central air conditioners and heat pumps. On behalf of the Appliance Standards Awareness Project. December 2000.

US Department of Energy (Docket EE-RM-500): Oral testimony at a public hearing on marginal price assumptions for assessing new appliance efficiency standards. On behalf of the Appliance Standards Awareness Project. November 2000.

Connecticut Department of Public Utility Control (Docket No. 99-09-03 Phase II): Direct testimony regarding Connecticut Natural Gas Company's proposed performance-based ratemaking mechanism. On behalf of the Connecticut Office of Consumer Counsel. September 25, 2000.

Mississippi Public Service Commission (Docket No. 96-UA-389): Oral testimony regarding generation pricing and performance-based ratemaking. On behalf of the Mississippi Attorney General. February 16, 2000.

Delaware Public Service Commission (Docket No. 99-328): Direct testimony regarding maintaining electric system reliability. On behalf of Delaware Public Service Commission Staff. February 2, 2000.

Delaware Public Service Commission (Docket No. 99-328): Filed expert report ("Investigation into the July 1999 Outages and General Service Reliability of Delmarva Power & Light Company," jointly authored with J. Duncan Glover and Alexander Kusko). Synapse Energy Economics and Exponent Failure Analysis Associates on behalf the Delaware Public Service Commission Staff. February 1, 2000.

New Hampshire Public Service Commission (Docket No. 99-099 Phase II): Oral testimony regarding standard offer services. On behalf of the Campaign for Ratepayers Rights. January 14, 2000.

West Virginia Public Service Commission (Case No. 98-0452-E-GI): Rebuttal testimony regarding codes of conduct. On behalf of the West Virginia Consumer Advocate Division. July 15, 1999.

West Virginia Public Service Commission (Case No. 98-0452-E-GI): Direct testimony regarding codes of conduct and other measures to protect consumers in a restructured electricity industry. On behalf of the West Virginia Consumer Advocate Division. June 15, 1999.

Public Service Commission of West Virginia (Case No. 98-0452-E-GI): Filed expert report (“Measures to Ensure Fair Competition and Protect Consumers in a Restructured Electricity Industry in West Virginia,” jointly authored with Jean Ann Ramey and Theo MacGregor) in the matter of the General Investigation to determine whether West Virginia should adopt a plan for open access to the electric power supply market and for the development of a deregulation plan. Synapse Energy Economics and MacGregor Energy Consultancy on behalf of the West Virginia Consumer Advocate Division. June 1999.

Massachusetts Department of Telecommunications and Energy (DPU/DTE 97-111): Direct testimony regarding Commonwealth Electric Company’s energy efficiency plan, and the role of municipal aggregators in delivering demand-side management programs. On behalf of Cape and Islands Self-Reliance Corporation. January 1998.

Delaware Public Service Commission (DPSC 97-58): Direct testimony regarding Delmarva Power and Light’s request to merge with Atlantic City Electric. On behalf of Delaware Public Service Commission Staff. May 1997.

Delaware Public Service Commission (DPSC 95-172): Oral testimony regarding Delmarva’s integrated resource plan and DSM programs. On behalf of the Delaware Public Service Commission Staff. May 1996.

Colorado Public Utilities Commission (5A-531EG): Direct testimony regarding the impact of proposed merger on DSM, renewable resources and low-income DSM. On behalf of the Colorado Office of Energy Conservation. April 1996.

Colorado Public Utilities Commission (3I-199EG): Direct testimony regarding the impacts of increased competition on DSM, and recommendations for how to provide utilities with incentives to implement DSM. On behalf of the Colorado Office of Energy Conservation. June 1995.

Colorado Public Utilities Commission (5R-071E): Oral testimony on the Commission's integrated resource planning rules. On behalf of the Colorado Office of Energy Conservation. July 1995.

Colorado Public Utilities Commission (3I-098E): Direct testimony on the Public Service Company of Colorado's DSM programs and integrated resource plans. On behalf of the Colorado Office of Energy Conservation. April 1994.

Delaware Public Service Commission (Docket No. 96-83): Filed comments regarding the Investigation of Restructuring the Electricity Industry in Delaware (Tellus Institute Study No. 96-99). On behalf of the Staff of the Delaware Public Service Commission. November 1996.

Colorado Public Utilities Commission (Docket No. 96Q-313E): Filed comments in response to the Questionnaire on Electricity Industry Restructuring (Tellus Institute Study No. 96-130-A3). On behalf of the Colorado Governor's Office of Energy Conservation. October 1996.

State of Vermont Public Service Board (Docket No. 5854): Filed expert report (Tellus Institute Study No. 95-308) regarding the Investigation into the Restructuring of the Electric Utility Industry in Vermont. On behalf of the Vermont Department of Public Service. March 1996.

Pennsylvania Public Utility Commission (Docket No. I-00940032): Filed comments (Tellus Institute Study No. 95-260) regarding an Investigation into Electric Power Competition. On behalf of The Pennsylvania Office of Consumer Advocate. November 1995.

New Jersey Board of Public Utilities (Docket No. EX94120585Y): Initial and reply comments (“Achieving Efficiency and Equity in the Electricity Industry Through Unbundling and Customer Choice,” Tellus Institute Study No. 95-029-A3) regarding an investigation into the future structure of the electric power industry. On behalf of the New Jersey Division of Ratepayer Advocate. September 1995.

ARTICLES

Malone, E., T. Woolf, D. Goldberg. 2019. “Assessing Resource Cost Effectiveness.” *A.E.S.P. Magazine*, 2019 Edition, 8-10.

Woolf, T., E. Malone, C. Neme, R. LeBaron. 2014. “Unleashing Energy Efficiency.” *Public Utilities Fortnightly*, October, 30-38.

Woolf, T., A. Sommer, J. Nielson, D. Berry, R. Lehr. 2005. “Managing Electricity Industry Risk with Clean and Efficient Resources.” *The Electricity Journal* 18 (2): 78–84.

Woolf, T., A. Sommer. 2004. “Local Policy Measures to Improve Air Quality: A Case Study of Queens County, New York.” *Local Environment* 9 (1): 89–95.

Woolf, T. 2001. “Clean Power Opportunities and Solutions: An Example from America’s Heartland.” *The Electricity Journal* 14 (6): 85–91.

Woolf, T. 2001. “What’s New With Energy Efficiency Programs.” *Energy & Utility Update, National Consumer Law Center*: Summer 2001.

Woolf T., B. Biewald. 2000. “Electricity Market Distortions Associated With Inconsistent Air Quality Regulations.” *The Electricity Journal* 13 (3): 42–49.

Ackerman, F., B. Biewald, D. White, T. Woolf, W. Moomaw. 1999. “Grandfathering and Coal Plant Emissions: the Cost of Cleaning Up the Clean Air Act.” *Energy Policy* 27 (15): 929–940.

Biewald, B., D. White, T. Woolf. 1999. “Follow the Money: A Method for Tracking Electricity for Environmental Disclosure.” *The Electricity Journal* 12 (4): 55–60.

Woolf, T., B. Biewald. 1998. “Efficiency, Renewables and Gas: Restructuring As if Climate Mattered.” *The Electricity Journal* 11 (1): 64–72.

Woolf, T., J. Michals. 1996. “Flexible Pricing and PBR: Making Rate Discounts Fair for Core Customers.” *Public Utilities Fortnightly*, July 1996.

Woolf, T., J. Michals. 1995. “Performance-Based Ratemaking: Opportunities and Risks in a Competitive Electricity Industry.” *The Electricity Journal* 8 (8): 64–72.

Woolf, T. 1994. "Retail Competition in the Electricity Industry: Lessons from the United Kingdom." *The Electricity Journal* 7 (5): 56–63.

Woolf, T. 1994. "A Dialogue About the Industry's Future." *The Electricity Journal* 7 (5).

Woolf, T., E. D. Lutz. 1993. "Energy Efficiency in Britain: Creating Profitable Alternatives." *Utilities Policy* 3 (3): 233–242.

Woolf, T. 1993. "It is Time to Account for the Environmental Costs of Energy Resources." *Energy and Environment* 4 (1): 1–29.

Woolf, T. 1992. "Developing Integrated Resource Planning Policies in the European Community." *Review of European Community & International Environmental Law* 1 (2) 118–125.

PRESENTATIONS

Woolf, T. B Havumaki. 2022. "Economic Assessment of Grid Modernization Plans." Presentation at the NASUCA 2022 Mid-Year Meeting.

Woolf, T. 2019. "Benefit-Cost Analysis for Utility-Facing Grid Modernization Investments." Distribution Systems and Planning Training for Mid-Atlantic Region and NARUC-NASEO Task Force on Comprehensive Electricity Planning. March 7-8, 2019.

Woolf, T. 2018. Stakeholder presentation on "Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota." Synapse Energy Economics project for Minnesota Department of Commerce, Division of Energy Resources, supported by the Conservation Applied Research and Development (CARD) Program. St. Paul, Minnesota. September 2018.

Woolf, T. 2018. "Benefit-Cost Analysis for Investments in the Modern Grid: Recent trends in how to determine whether grid modernization investments will deliver value to customers." Smart Money Panel, NARUC Summer Policy Summit. Scottsdale, Arizona.

Woolf, T. 2018. "Benefit-Cost Analysis for New York Energy Investments." Training Session for Earthjustice.

Woolf, T. 2018. "National Standard Practice Manual for Energy Efficiency Cost-Effectiveness." Presentation at the NASUCA 2018 Mid-Year Meeting.

Woolf, T. 2018. "The National Standard Practice Manual and the Value of Energy Efficiency in New York." Presentation on behalf of the Natural Resources Defense Council at the Stakeholder Forum, Case 18-M-0084.

Woolf, T., M. Whited. 2016. "Show Me the Numbers: A Framework for Balanced Distributed Solar Policies." Presentation for Consumers Union Webinar, December 2016.

Woolf, T. 2016. "Show Me the Numbers: Balancing Solar DG with Consumer Protection." Public workshop on solar distributed generation for the Federal Trade Commission, June 2016.

Woolf, T. 2016. "Rate Designs for Distributed Generation: State Activities & A New Framework." Presentation at the NASUCA 2016 Mid-Year Meeting, June 2016.

Woolf, T., M. Whited. 2016. "3rd Annual 21st Century Electricity System Workshop – Implications of Different Rate Designs." Presentation at the Advanced Energy Economy Institute, April 2016.

Woolf, T., M. Whited. 2016. "Decoupling in Pennsylvania: Advantages, Disadvantages, and Design Issues." Presentation to Pennsylvania Decoupling Stakeholders, February 2016.

Woolf, T. 2016. "Earnings Impact Mechanisms: Energy Efficiency." Presentation at the New York REV Technical Conference, January 2016.

Lowry, M. N., T. Woolf. 2015. "Performance-Based Regulation in a High Distributed Energy Resources Future." Webinar on January 2016.

Woolf, T. 2015. "Performance Incentive Mechanisms: A Catalyst for Change." Webinar for Power Sector Transformation Group, December 2015.

Woolf, T. 2015. "Energy Efficiency Valuation: Boogie Men, Time Warps, and other Terrifying Pitfalls." Presentation at ACEEE Conference on Energy Efficiency as a Resource, September 2015.

Woolf, T., M. Whited, A. Napoleon. 2015. "Thoughts on How to Design Clean Energy Performance Incentive Mechanisms." Webinar for the Western Clean Energy Advocates, April 2015.

Woolf, T. 2015. "Properly Valuing the Benefits and Costs of Energy Efficiency." Presentation at the 2015 National Efficiency Advocates Meeting, April 2015.

Woolf, T. 2015. "Non-Energy Benefits & Efficiency Program Screening." Presentation for Georgia DSM Work Group, March 2015.

Woolf, T. 2014. "Performance Incentive Mechanisms And Their Role in New Regulatory Models." Presentation at Acadia Center Conference, Envisioning Our Energy Future, December 2014.

Woolf, T., M. Whited., A. Napoleon. 2014. "Guiding Utility Performance: A Handbook for Regulators." Webinar for the Western Interstate Energy Board, December 2014.

Woolf, T. 2014. "Planning for Distributed Energy Resources." Presentation for Advanced Energy Economy Webinar, November 2014.

Woolf, T. 2014. "Benefit-Cost Analysis for Distributed Energy Resources in New York: A Framework for Accounting for All Relevant Costs and Benefits." Presentation to NARUC ERE Committee, November 2014.

Woolf, T. 2014. "Presenting the Full Value of Energy Efficiency: Creating a Better Message." Presentation at Sierra Club Beyond Coal Conference, October 2014.

Woolf, T., C. Neme. 2014. "Regulatory Policies to Support Energy Efficiency in Virginia." Presentation for the 2014 Virginia Energy Efficiency Workshop, October 2014.

Woolf, T. 2014. "Benefit-Cost Analysis for Distributed Energy Resources in New York: A Framework for Accounting for All Relevant Costs and Benefits." Presentation for Advanced Energy Economy Institute, October 2014.

Woolf, T. 2014. "Performance Incentive Mechanisms: Digging Deeper Into Performance-Based Regulation." Presentation for National Governor's Association Conference: Utility Business Models That Align with State Clean Energy Goals, September 2014.

Woolf, T. 2014. "The Resource Value Framework: Reforming Energy Efficiency Cost-Effectiveness Screening." Presentation at the ACEEE Summer Study, August 2014.

Woolf, T. 2014. "Cost-Effectiveness of Demand Response." Presentation at MADRI Working Group Meeting #34, July 2014.

Woolf, T. 2014. "Time to Overhaul Our Energy Efficiency Screening Practices." Presentation for U.S. Environmental Protection Agency Energy Efficiency Cost-Effectiveness Webinar, January 2014.

Woolf, T. 2013. "Survey of Energy Efficiency Screening Practices in the Northeast and Mid-Atlantic." Presentation for Northeast Energy Efficiency Partnerships EM&V Forum Annual Public Meeting, December 2013.

Woolf, T. 2013. "Recommendations for Reforming Energy Efficiency Cost-Effectiveness Screening in the United States." Presentation at the National Association of Regulatory Commissioners Annual Meeting, November 2013.

Woolf, T. 2013. "Energy Efficiency Program Screening: Let's Get Beyond the TRC Test." Presentation for 7th Annual ENERGY STAR Certified Homes Utility Sponsor Meeting, October 2013.

Woolf, T. 2013. "Decoupling in Maine: Why Decoupling is in Consumers' Interest." Presentation for Office of Public Advocate- Decoupling Debate, October 2013.

Woolf, T. 2013. "NHPC Efficiency Screening Initiative: Unleashing the Potential for Energy Efficiency." Presentation for Advocates Meeting, September 2013.

Woolf, T. 2013. "Energy Efficiency: Rate, Bill and Participation Impacts." Presentation for ACEEE's Energy Efficiency as a Resource Conference, September 2013.

Woolf, T. 2013. "Energy Efficiency Screening: Challenges and Opportunities." Presentation for NARUC Summer Meeting Consumer Affairs Panel, July 2013.

Woolf, T., R. Sedano. 2013. "Decoupling Overview." Presentation for Finding Common Ground Meeting, July 2013.

Woolf, T. 2013. "Utility Incentives for Energy Efficiency." Presentation for Finding Common Ground Meeting, July 2013.

Woolf, T. 2013. "Energy Efficiency: Rate, Bill and Participation Impacts." Presentation for State Energy Efficiency Action Webinar, June 2013.

Woolf, T., B. Biewald, and J. Migden-Ostrander. 2013. "NARUC Risk Workshop for Regulators." Presentation at the Mid-Atlantic Conference of Regulatory Utility Commissioners, June 2013.

Woolf, T. 2013. "Energy Efficiency Screening: Accounting for 'Other Program Impacts' & Environmental Compliance Costs." Presentation for the Consortium for Energy Efficiency Summer Meeting, May 2013.

Woolf, T. 2013. "Best Practices in Energy Efficiency Program Screening." Presentation at ACI National Home Performance Conference, May 2013.

Woolf, T. 2013. "Utility Shareholder Incentives to Support Energy Efficiency Programs." Presentation to Common Ground, May 2013.

Woolf, T. 2013. "Energy Efficiency Screening: Accounting for 'Other Program Impacts' & Environmental Compliance Costs." Presentation for Regulatory Assistance Project Webinar, March 2013.

Woolf, T. 2013. "Energy Efficiency: Rates, Bills, Participants, Screening, and More." Presentation at Connecticut Energy Efficiency Workshop, March 2013.

Woolf T. 2013. "Best Practices in Energy Efficiency Program Screening." Presentation for SEE Action Webinar, March 2013.

Woolf, T. 2013. "Energy Efficiency: Rates, Bills and Participants." Presentation for Rhode Island Energy Efficiency Collaborative, February 2013.

Woolf, T. 2013. "Energy Efficiency Screening: Application of the TRC Test." Presentation for Energy Advocates Webinar, January 2013.

Woolf, T. 2012. "Best Practices in Energy Efficiency Program Screening." Presentation for American Council for an Energy-Efficient Economy Webinar, December 2012.

Woolf, T. 2012. Indian Point Replacement Analysis: A Clean Energy Roadmap. Presentation for Natural Resource Defenses Council and Environmental Entrepreneurs, November 2012.

Woolf, T. 2012. "In Pursuit of All Cost-Effective Energy Efficiency." Presentation at Sierra Club Boot Camp, October 2012.

Woolf, T. 2012. "Best Practices in Energy Efficiency Program Screening." Webinar for Northeast Energy Efficiency Partnerships, September 2012.

Woolf, T., L. Schwartz. "What Remains to be Done with Demand Response? A National Forum from the FERC National Action Plan on Demand Response Tries to Give an Answer." Presentation at NARUC National Town Meeting on Demand Response, July 2012.

Woolf, T. 2012. "Best Practices in Energy Efficiency Program Screening." Presentation at NARUC Summer Meetings – Energy Efficiency Cost-Effectiveness Breakfast, July 2012.

Woolf, T. 2012. "Avoided Cost of Complying with Environmental Regulations in MA." Presentation for Mass Energy Consumer's Alliance, January 2012.

Woolf, T. 2011. "Energy Efficiency Cost-Effectiveness Tests." Presentation at the Northeast Energy Efficiency Partnerships Annual Meeting, October 2011.

Woolf, T. 2011. "Why Consumer Advocates Should Support Decoupling." Presentation at the 2011 ACEEE National Conference on Energy Efficiency as a Resource, September 2011.

Woolf, T. 2011. "A Regulator's Perspective on Energy Efficiency." Presentation at the Efficiency Maine Symposium *In Pursuit of Maine's Least-Cost Energy*, September 2011.

Woolf, T. 2010. "Bill Impacts of Energy Efficiency Programs: The Importance of Analyzing and Managing Rate and Bill Impacts." Presentation at the Energy in the Northeast Conference, Law Seminar International, September 2010.

Woolf, T. 2010. "Bill Impacts of Energy Efficiency Programs: The Implications of Bill Impacts in Developing Policies to Motivate Utilities to Implement Energy Efficiency." Presentation to the State Energy Efficiency Action Network, Utility Motivation Work Group, November 2010.

Woolf, T. 2010. "Bill Impacts of Energy Efficiency Programs." Presentation to the Energy Resources and Environment Committee at the NARUC Winter Meetings, February 2010.

Woolf, T. 2009. "Price-Responsive Demand in the New England Wholesale Energy Market: Description of NECPUC's Limited Supply-Side Proposal." Presentation at the NEPOOL Markets Committee Meeting, November 2009.

Woolf, T. 2009. "Demand Response in the New England Wholesale Energy Market: How Much Should We Pay for Demand Resources?" Presentation at the New England Electricity Restructuring Roundtable, October 2009.

Woolf, T. 2008. "Promoting Demand Resources in Massachusetts: A Regulator's Perspective." Presentation at the Energy Bar Association, Northeast Chapter Meeting, June 2008.

Woolf, T. 2008. "Turbo-Charging Energy Efficiency in Massachusetts: A DPU Perspective." Presentation at the New England Electricity Restructuring Roundtable, April 2008.

Woolf T. 2002. "A Renewable Portfolio Standard for New Brunswick." Presentation to the New Brunswick Market Design Committee, January 10, 2002.

Woolf, T. 2001. "Potential for Wind and Renewable Resource Development in the Midwest." Presentation at WINDPOWER 2001 in Washington DC, June 7, 2001.

Woolf T. 1999. "Challenges Faced by Clean Generation Resources Under Electricity Restructuring." Presentation at the Symposium on the Changing Electric System in Florida and What it Means for the Environment in Tallahassee, FL, November 1999.

Woolf, T. 2000. "Generation Information Systems to Support Renewable Portfolio Standards, Generation Performance Standards and Environmental Disclosure." Presentation at the Massachusetts Restructuring Roundtable on behalf of the Union of Concerned Scientists, March 2000.

Woolf, T. 1998. "New England Tracking System Project: An Electricity Tracking System to Support a Wide Range of Restructuring-Related Policies." Presentation at the Ninth Annual Energy Services Conference and Exposition in Orlando, FL, December 1998.

Woolf, T. 2000. "Comments of the Citizens Action Coalition of Indiana." Presentation at Workshop on Alternatives to Traditional Generation Resources, June 2000.

Woolf, T. 1996. "Overview of IRP and Introduction to Electricity Industry Restructuring." Training session provided to the staff of the Delaware Public Service Commission, April 1996.

Woolf, T. 1995. "Competition and Regulation in the UK Electric Industry." Presentation at the Illinois Commerce Commission's workshop on Restructuring the Electric Industry, August 1995.

Woolf, T. 1995. "Competition and Regulation in the UK Electric Industry." Presentation at the British Columbia Utilities Commission Electricity Market Review, February 1995.

Resume updated August 2022