

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

**I/M/O THE VERIFIED PETITION OF)
ROCKLAND ELECTRIC COMPANY)
FOR ESTABLISHMENT OF A)
STORM HARDENING SURCHARGE)**

BPU Docket No. ER14030250

**DIRECT TESTIMONY OF TIM WOOLF
ON BEHALF OF DIVISION OF RATE COUNSEL**

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List of Schedules

Schedule TW-1: Resume of Tim Woolf

1 **1. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, title, and employer.**

3 A. My name is Tim Woolf. I am a Vice President at Synapse Energy Economics, located at
4 485 Massachusetts Avenue, Cambridge, MA 02139.

5 **Q. Please describe Synapse Energy Economics.**

6 A. Synapse Energy Economics (Synapse) is a research and consulting firm specializing in
7 electricity and gas industry regulation, planning, and analysis. Our work covers a range of
8 issues, including economic and technical assessments of demand-side and supply-side
9 energy resources; energy efficiency policies and programs; integrated resource planning;
10 electricity market modeling and assessment; renewable resource technologies and
11 policies; and climate change strategies. Synapse works for a wide range of clients,
12 including attorneys general, offices of consumer advocates, public utility commissions,
13 environmental advocates, the U.S. Environmental Protection Agency, U.S. Department of
14 Energy, U.S. Department of Justice, the Federal Trade Commission and the National
15 Association of Regulatory Utility Commissioners. Synapse has over 25 professional staff
16 with extensive experience in the electricity industry.

17 **Q. Please summarize your professional and educational experience.**

18 A. Before rejoining Synapse Energy Economics, I was a commissioner at the Massachusetts
19 Department of Public Utilities (DPU). In that capacity, I was responsible for overseeing a
20 substantial expansion of clean energy policies, including significantly increased
21 ratepayer-funded energy efficiency programs; an update of the DPU energy efficiency
22 guidelines; the implementation of decoupled rates for electric and gas companies; the

1 promulgation of net metering regulations; review and approval of smart grid pilot
2 programs; and review and approval of long-term contracts for renewable power. I was
3 also responsible for overseeing a variety of other dockets before the commission,
4 including several electric and gas utility rate cases.

5 Prior to being a commissioner at the Massachusetts DPU, I was employed as the Vice
6 President at Synapse Energy Economics; a Manager at Tellus Institute; the Research
7 Director at the Association for the Conservation of Energy; a Staff Economist at the
8 Massachusetts Department of Public Utilities; and a Policy Analyst at the Massachusetts
9 Executive Office of Energy Resources.

10 I hold a Master's in Business Administration from Boston University, a Diploma in
11 Economics from the London School of Economics, a BS in Mechanical Engineering and
12 a BA in English from Tufts University. My resume, attached as Schedule TW-1, presents
13 additional details of my professional and educational experience.

14 **Q. On whose behalf are you testifying in this case?**

15 A. I am testifying on behalf of the Division of Rate Counsel.

16 **Q. Have you previously testified before the New Jersey Board of Public Utilities?**

17 A. No.

18 **Q. What is the purpose of your testimony?**

19 A. The purpose of my testimony is to review RECO's advanced metering infrastructure
20 (AMI) petition to recover the costs of advanced meters in this storm hardening
21 proceeding. I address the relevancy of AMI in the context of the storm hardening

1 proceeding, I critique the Company's benefit-cost analysis, and discuss negative impacts
2 that the Company's proposal might have on ratepayers.

3 **2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

4 **Q. Please summarize your primary conclusions.**

5 A. My conclusions can be summarized as follows:

6 1) AMI's connection to storm-hardening is tenuous – the Company estimates AMI
7 meters would reduce outage durations by 0.3 percent, or 16 seconds per customer.

8 Such small storm-hardening benefits are not sufficient to qualify the investment
9 for extraordinary cost recovery mechanism that the Company has requested.

10 2) The Company's benefit-cost analysis shows that the costs outweigh the benefits to
11 ratepayers.

12 3) The Company's proposal would have other detrimental impacts on ratepayers that
13 choose to opt out of the meter upgrade, due to the excessive opt-out fees proposed
14 by the Company.

15 **Q. Please summarize your recommendations.**

16 A. I offer the following recommendations:

17 1. The Company's proposal for AMI should not be considered within the storm
18 hardening docket; instead it should be considered as part of a general rate case.

19 2. The Board should reject the Company's proposal based on the Company's current
20 projections that the AMI installation will result in net costs to ratepayers.

21 3. The Board should reject the Company's excessive opt-out fees.

1 **3. OVERVIEW OF RECO'S PROPOSAL**

2 **Q. Please summarize RECO's proposal.**

3 A. On March 16, 2015, RECO filed a petition for approval to implement various incremental
4 storm hardening and resiliency proposals. To recover the costs associated with these
5 proposals, the Company requests Board approval of a Storm Hardening Surcharge.

6 One of the primary components of the Company's proposal is to upgrade its metering
7 infrastructure throughout the Bergen County section of its service territory using AMI,
8 including the replacement of approximately 58,000 meters with smart meters over a five-
9 year period.¹ The Company claims that the meter upgrade will reduce operating costs and
10 provide system resiliency benefits.

11 **Q. Has the Company estimated the dollar value of the benefits provided by AMI?**

12 A. Yes. The Company estimates that the undiscounted cumulative savings from customer
13 meter operations and organizational savings will total \$49.9 million with an additional
14 \$5.9 million of savings from deferred capital.²

15 **Q. What operational savings does the Company claim smart meters offer?**

16 A. The Company claims that smart meters will provide numerous operational savings,
17 including reductions in:

18 • outage restoration costs,³

¹ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 3.

² RECO response to RCR-AMI-2, "Attachment-RCR-AMI-2 ENJ MUP BPU Workbook 4 22 15 V2.xls."

³ Due to faster restoration time, and thus savings in terms of line crew costs.

-
- 1 • false dispatches,
 - 2 • meter reading costs,
 - 3 • connections and disconnection costs,
 - 4 • field tests for high bills or zero usage,
 - 5 • revenue losses from unoccupied premises and theft,
 - 6 • need for rebilling due to estimated meter readings, and
 - 7 • call center inquiries and bill complaints.⁴

8 **Q. Where does the Company estimate that most of the operational savings will come**
9 **from?**

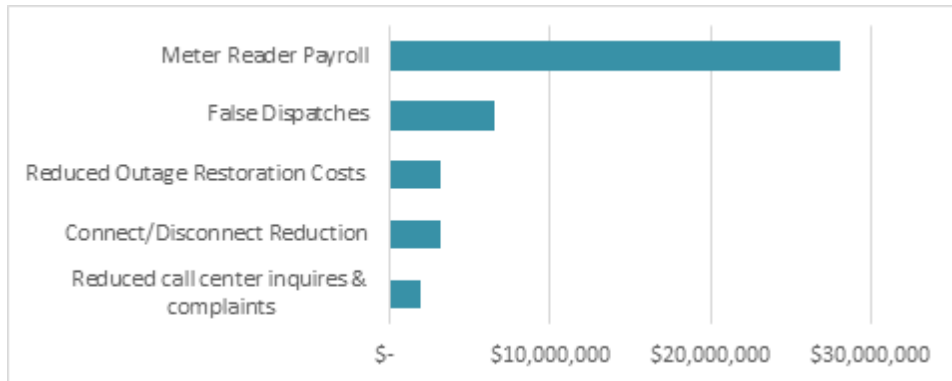
10 A. Figure 1 presents a summary of the five primary operational benefit categories estimated
11 by the Company. Approximately half of the savings stem from reducing the number of
12 meter readers on payroll. The Company estimates that seven meter reading positions will
13 be eliminated, leading to annual savings ranging from approximately \$1.5 million to \$1.9
14 million per year following the full smart meter roll-out, for an undiscounted cumulative
15 total of \$28.1 million over 20 years.⁵

16 Reductions in false dispatches, reduced outage restoration costs, reductions in
17 connection/disconnection costs, and reduced call center costs comprise the remainder of
18 the top five savings categories. These other primary benefits are dwarfed by the reduction
19 in meter reading costs, as shown in terms of cumulative, 20-year savings in the chart

⁴ RECO response to RCR-AMI-2, "Attachment-RCR-AMI-2 ENJ MUP BPU Workbook 4 22 15 V2.xls."

⁵ *Id.*

1 below. A host of other benefits are also quantified by the Company, but these benefits are
2 of an even smaller magnitude.



3
4 **Figure 1. Cumulative 20-year Undiscounted Savings of Five Primary AMI Benefits⁶**

5 **4. SMART METERS AND STORM HARDENING**

6 **Q. What is the purpose of the Company’s storm hardening proposals?**

7 A. The stated purpose of these proposals is to be better prepared for increased major storm
8 activity and to respond to “the Board’s desire to support and protect New Jersey’s utility
9 infrastructure so that it may better withstand major storm events.”⁷

10 **Q. How do smart meters relate to storm hardening?**

11 A. The Company claims that the meter upgrade project will provide resiliency benefits to
12 customers by “significantly improv[ing] the Company’s outage management by
13 deploying technologies that enhance outage detection.”⁸

⁶ *Id.*

⁷ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 1.

⁸ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 4, lines 5-6.

1 **Q. How will smart meters enhance outage detection?**

2 A. The Company claims that smart meters will facilitate the identification of outages
3 (including nested outages⁹) and customers that have already been restored, and will help
4 the Company to dispatch the appropriate crews to fix the problem. The Company states
5 that this will result in “quicker, more efficient service restoration.”¹⁰

6 **Q. Has the Company quantified the extent to which AMI meters will reduce outage
7 time?**

8 A. Yes, the Company has estimated that outage time will be reduced by 0.3 percent.¹¹
9 According to the Company, the average restoration time is approximately 88.3 minutes
10 per customer over the course of the year.¹² Thus, according to the Company’s estimates,
11 the installation of the AMI system would reduce the outage duration time to
12 approximately 88 minutes— a reduction of 16 seconds per customer. The monetized
13 benefit of this improvement is estimated to be \$143,524 per year (or \$3.1 million over 20
14 years, undiscounted), based on reductions in line crew time.¹³

15 **Q. Does a reduction in outage time of 0.3 percent constitute a “significant
16 improvement”?**

17 A. No. Also, the reduction in cost due to faster restoration time represents only 5.6 percent
18 of the undiscounted 20-year total benefits of the AMI investments.

⁹ The Company defines nested outages as “where restoration was completed on the main lines of a circuit, but customers whose service is provided through distribution spurs are still without power.” RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 4, lines 11-12.

¹⁰ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 4, line 9.

¹¹ RECO response to RCR-AMI-19(a).

¹² *Id.*

¹³ RECO response to RCR-AMI-2, “Attachment-RCR-AMI-2 ENJ MUP BPU Workbook 4 22 15 V2.xls”

1 **Q. Has the Company quantified any other storm hardening benefits?**

2 A. As noted above, the Company claims that AMI will enable it to dispatch crews
3 appropriate to the service problem, which will both enable it to restore service more
4 quickly, while also reducing costs. Some of these benefits would likely occur on blue sky
5 days, while some of them would accrue during major storms. The monetized benefit of
6 improving dispatching is estimated to be \$299,263 per year (or \$6.6 million over 20
7 years, undiscounted). This equates to approximately 11.8 percent of the total
8 undiscounted 20-year AMI benefits.¹⁴

9 **Q. How much does the Company estimate that it will cost to achieve these storm**
10 **hardening benefits?**

11 A. The Company estimates the undiscounted meter upgrade costs to be \$51.3 million over
12 20 years.¹⁵

13 **Q. Do these benefits justify extraordinary cost recovery?**

14 A. No. The investment in AMI should be considered in a general rate case, rather than a
15 storm hardening docket, for two reasons. First, the connection to resiliency is tenuous at
16 best, given that outage restoration time would be reduced by only 0.3 percent. Such a
17 minor improvement in outage restoration should not be used as an excuse to pass through
18 costs to ratepayers through a “Storm Hardening Surcharge.”

¹⁴ RECO response to RCR-AMI-2, “Attachment-RCR-AMI-2 ENJ MUP BPU Workbook 4 22 15 V2.xls”

¹⁵ RECO response to RCR-AMI-32, “RCR-AMI-32 Attachment RECO MUP Fin Model.xls.”

1 Second, the vast majority of benefits are not directly storm-related. Only 17 percent of
2 the benefits are storm-related. Rather, the majority of benefits result from reduced meter-
3 reading costs. Thus the investment would be more appropriately addressed in a standard
4 rate case proceeding.

5 **5. THE COMPANY'S ANALYSIS SHOWS THAT THE AMI PROJECT'S COSTS**
6 **OUTWEIGH ITS BENEFITS**

7 **Q. Did the Company show that the project will be beneficial to ratepayers?**

8 A. No. The Company has failed to show that the project will provide net benefits for
9 ratepayers. As I will describe in more detail:

- 10 • The Company's original filing lacked analytical rigor, mainly by failing to
11 calculate the present value of benefits and costs.
- 12 • Supplemental analysis provided by the Company shows that, with discounting
13 applied, the project's costs to ratepayers outweigh its benefits.

14 **Q. Did the Company estimate revenue requirements to show how these costs and**
15 **benefits would affect ratepayers?**

16 A. Not in the initial filing. The Company's original estimates were not based on revenue
17 requirements, and thereby did not indicate what the impact would be on ratepayers. It
18 later provided a revenue requirement analysis in response to a discovery request from

1 Rate Counsel.¹⁶ As I will discuss further, however, this corrected analysis showed that
2 the project’s costs to ratepayers would be greater than its benefits.

3 **Q. Does the Company claim that the project will result in a net benefit to ratepayers?**

4 A. Yes. In the filing, the Company claims that the project will provide a “net benefit of
5 \$25.6 million.”¹⁷

6 **Q. Does the “net benefit” of \$25.6 million include all costs?**

7 A. No. In response to a data request, the Company stated that the “capital cost of the project
8 is not included” in the calculation of the \$25.6 million in “net benefits.”¹⁸

9 **Q. Is it common to estimate net benefits without including up-front costs?**

10 A. No. Claiming net benefits to a project without counting the upfront costs of investing in
11 that project is clearly wrong and misleading. Thus, this claimed “net benefit” should be
12 ignored.

13 **Q. Were there any additional flaws in the Company’s initial filing?**

14 A. Yes. The Company used nominal dollars to claim that the project “shows substantial
15 benefits over the 20-year life of the project that more than covers the cost of the
16 project”¹⁹ (emphasis added).

¹⁶ Following a request from Rate Counsel in the settlement and discovery call with all parties on August 5, 2015, the Company responded to RCR-AMI-32 by providing the revenue requirements analysis in “RCR-AMI-32-Attachment RECO MUP Fin Model.xls” on August 7, 2015.

¹⁷ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p.17, lines 1-2.

¹⁸ RECO response to RCR-AMI-5.

¹⁹ RECO response to RCR-AMI-28.

1 In the supporting initial analysis, the Company estimated benefits and costs for 20 years
2 (2016-2035) due to the project.²⁰ However, the total costs and benefits were presented in
3 “nominal” terms and then summed together. As the Company stated: “The costs and
4 benefits are estimated dollars without cost of money or provision for the time value of
5 money.”²¹ These concepts are too important to be ignored, for reasons I will explain.

6 **Q. What is a nominal cost or benefit?**

7 A. Nominal dollars are sometimes referred to as “current year dollars” since they are the
8 dollar value in the year being presented. As we all know, prices of goods and services
9 change over time due to inflation. The impacts of inflation should be taken into account
10 when conducting a benefit-cost analysis.

11 **Q. Why should one account for inflation?**

12 A. If dollar costs or benefits that will occur in different years are combined, they should be
13 adjusted for an assumed inflation rate in order to arrive at “real” or “constant” dollars.
14 For instance, dollars spent in 2016 should not be added to dollars spent in 2035 without
15 adjusting for changes in inflation. Otherwise, changes in purchasing power over time are
16 obscured.

²⁰ See RECO response to RCR-AMI-2, “Attachment-RCR-AMI-2 ENJ MUP BPU Workbook 4 22 15 V2.xls.”

²¹ RECO response to RCR-AMI-7.

1 **Q. Please explain what you mean by the “time value of money.”**

2 A. Even when one accounts for the effect of inflation, costs and benefits in the future are not
3 weighted the same as costs and benefits today. That is, a dollar received today is worth
4 more than a dollar that one must wait ten years to receive.

5 **Q. How does one account for the time value of money?**

6 A. Investment decisions that have costs and benefits over multiple years are typically
7 evaluated using a “discount rate,” which places a value on foregoing benefits or costs for
8 each additional year.²² Using a discount rate to account for the time value of money
9 allows one to evaluate the entire stream of benefits and costs on an equivalent basis.

10 **Q. How does one use the discount rate to determine whether a project is beneficial?**

11 A. Once one has applied the discount rate to future costs and benefits, one simply subtracts
12 the summation of the discounted costs from the discounted benefits. This is referred to as
13 the “net present value.” This metric allows for comparison of different options that bear
14 differing benefits and costs over a given time period. If the summation of the discounted
15 benefits are greater than the summation of the discounted costs, then the net present value
16 will be positive, and the project is considered to be cost-effective. This concept of net
17 present value is widely used throughout the electricity industry, and elsewhere, as one of
18 the primary indications of where an investment should be undertaken.

²² A discount rate can be in nominal or real terms. If the stream of dollars being discounted is in nominal dollars then a nominal discount rate is appropriate. If the stream of dollars being discounted is in real or constant dollars then a real discount rate is appropriate.

1 **Q. Should the Board give any weight to the Company’s conclusion that the project has**
2 **“substantial benefits” based on the initial filing?**

3 A. Absolutely not. I know of no utility or commission that makes investment decisions by
4 comparing the summation of undiscounted, nominal dollars over a long-term period.

5 **Q. Did the Company attempt to correct its original analysis?**

6 A. Yes. The Company provided a supplemental analysis on August 12th—four months after
7 the initial filing and one month after Rate Counsel issued data requests asking whether a
8 present value analysis was performed.²³ This new analysis provided both discounted and
9 undiscounted benefits and costs.²⁴

10 **Q. After conducting this supplemental analysis, did the Company maintain that the**
11 **project was beneficial?**

12 A. Yes. The Company claimed to provide “an additional analysis that considers the time
13 value of money and also reflects positive results on this investment.”²⁵ When Rate
14 Counsel asked if the Company still claimed “substantial benefits after accounting for the
15 time value of money,” the Company responded: “Yes.”²⁶

²³ Data request RCR-AMI-8.

²⁴ RECO response to RCR-AMI-32, “RCR-AMI-32-Attachment RECO MUP Fin Model.xls.”

²⁵ RECO response to RCR-AMI-36.

²⁶ *Id.*

1 **Q. Does the Company’s supplemental analysis support this claim?**

2 A. No. The Company asserts that the “break-even / payback period is 9.6 years”—i.e., that
3 the project becomes beneficial after 9.6 years.²⁷ However, according to the Company’s
4 workbook, this “simple breakeven” calculation is based on “undiscounted” cash flow.²⁸
5 According to the workbook, here the Company is evaluating nominal dollar cash flow
6 over a 30-year period (instead of a 20-year period). When discounting is applied, the
7 analysis shows that the project breaks even in “>30 years”—i.e., after the analysis
8 period.²⁹ This result indicates that the Company’s proposed AMI project’s benefits will
9 not outweigh its costs.

10 **Q. Does the Company explain why it believes the undiscounted breakeven point is**
11 **relevant?**

12 A. Yes. In a document provided in response to discussions with Rate Counsel, the Company
13 explained that it “employed an undiscounted break-even analysis because the Company’s
14 priority was on when it would recoup the investment in the AMI project.”³⁰ This
15 response suggests that the economic analysis was performed to assess the financial
16 impact of the AMI investment on the Company, not the impact on the ratepayers. In order
17 to obtain regulatory approval for a large capital investment such as this, the economic

²⁷ *Id.*

²⁸ RECO response to RCR-AMI-32, “RCR-AMI-32-Attachment RECO MUP Fin Model.xls,” “Pro forma” tab, cell A326.

²⁹ *Id.*, cell B348.

³⁰ Document entitled “Discussion regarding payback period – Simple break even (undiscounted) vs. discounted - A time value of money analysis”, provided by RECO on August 21, 2015 in response to a previous discussion with Rate Counsel.

1 analysis must consider the impact on ratepayers, not on how quickly the Company can
2 “recoup” its costs.

3 The Company explains that “the AMI project should be considered analogous to other
4 large capital projects the Company undertakes, such as building a substation or
5 transmission line” and “should not be approved or rejected based solely on a financial
6 analysis.”³¹ Large capital projects are typically reviewed by regulators on the basis of the
7 net present value of revenue requirements, contrary to what the Company claims here.
8 The financial analysis performed by the Company already incorporates a quantification
9 of benefits from the projects—and fails to show that they are cost-effective once the time
10 value of money is applied. If the Company believes that there are more benefits to be had,
11 then it should attempt to quantify them and incorporate the new benefits into the financial
12 analysis.

13 **Q. As part of its supplemental analysis, did the Company analyze the discounted net**
14 **revenue requirements of the project in order to determine the impact on rates?**

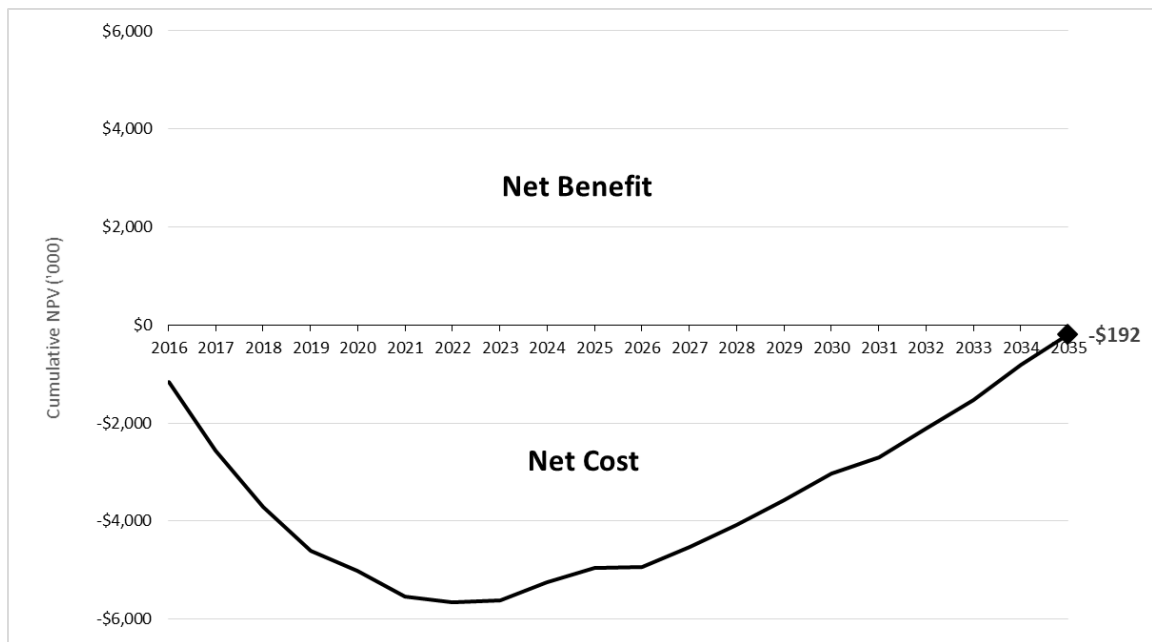
15 A. Yes. The Company estimated how benefits and costs would flow to ratepayers in terms of
16 savings and revenue requirements, respectively.

³¹ *Id.*

1 **Q. Does the Company’s analysis show net savings to ratepayers?**

2 A. No. The Company estimated the discounted value of savings as \$31,622,494 and the
3 discounted value of costs as \$31,814,905. The difference between the two—the “net
4 present value”—results in a net cost to ratepayers of \$192,411 over a 20-year period.³²

5 Figure 2 shows the cumulative net benefit of the project by year, including the
6 Company’s 20-year result of \$192,411 net cost (see the diamond). This was calculated by
7 summing the Company’s discounted savings and revenue requirements in each year. The
8 figure shows that the project never “breaks even” for ratepayers inside of 20 years.
9 Simply put, the costs of the project outweigh the benefits.



10

11 **Figure 2. Cumulative Net Benefit of the Project, by Year (NPV, \$000)³³**

³² RECO response to RCR-AMI-32, “RCR-AMI-32-Attachment RECO MUP Fin Model.xls,” “Pro forma” tab, cells C54, C73, and C77.

³³ RECO response to RCR-AMI-32, “RCR-AMI-32 Attachment RECO MUP Fin Model.xls.”

1 **Q. In this proceeding, has the Company shown that the project will benefit ratepayers?**

2 A. No. The Company has failed on many counts to show a net benefit. First, its initial filing
3 did not calculate revenue requirements and completely ignored the time value of money,
4 thereby claiming more benefits than actually might exist. Second, the updated analysis—
5 which attempts to rectify these issues—has shown that the project will cost ratepayers
6 more than what they will save over the 20-year planning horizon.

7 **6. METER ROLL-OUT AND STRANDED COSTS**

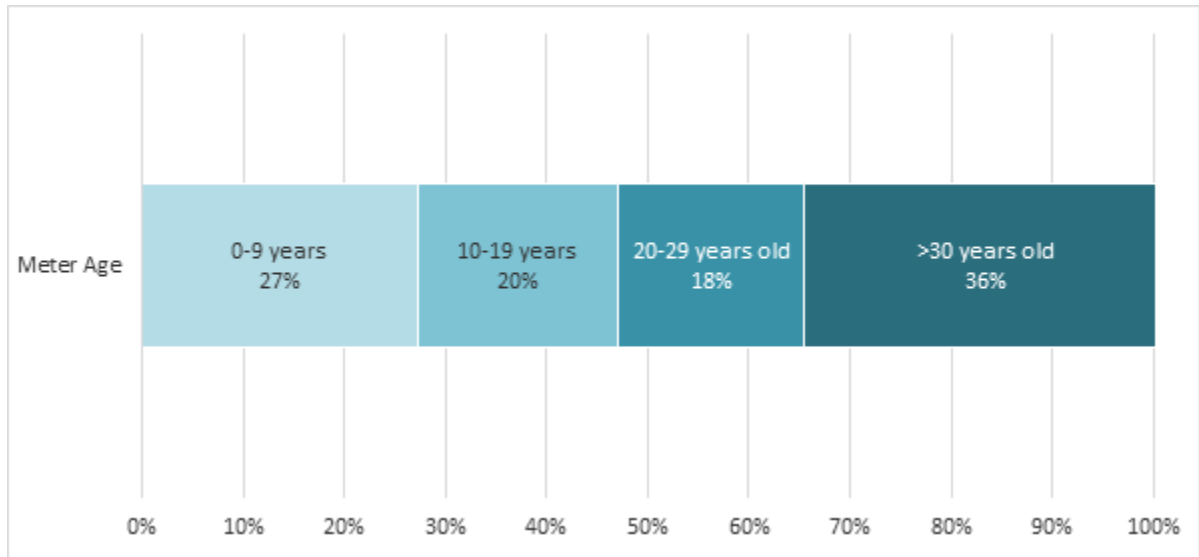
8 **Q. Is the Company proposing to replace only meters that have been fully depreciated?**

9 A. No, the Company is proposing to replace all of the meters in Bergen County, many of
10 which have not been fully depreciated because they were installed relatively recently.³⁴

11 **Q. How old are the meters that the Company is proposing to replace?**

12 A. The ages of the meters vary. However, 27 percent of the meters are less than ten years
13 old, nearly half of the meters are less than 20 years old, and a cumulative total of 65
14 percent are less than 30 years old, as shown in the chart below.

³⁴ Response to RCR-AMI-39, “RCR-AMI-39-Attachment Inventory Report ENJ Age.xls.”



1

2

Figure 3. Meter Age³⁵

3

Q. What is the book life and expected operating life of a meter?

4

A. According to the Company’s response to RCR-AMI-10, the book life and the expected operating life of the existing meters is 30 years for electromechanical meters and 20 years for solid state meters. Currently all of the solid state meters are less than 20 years old.

5

6

Q. What percent of the existing meters have not yet reached the end of their expected operating lives?

7

8

A. Nearly 65 percent of the existing meters have not yet reached the end of their expected operating lives.³⁶

9

10

Q. What are the undepreciated costs of these existing meters?

11

A. The undepreciated costs total approximately \$5.6 million.³⁷

³⁵ Developed from data provided in response to RCR-AMI-39, “RCR-AMI-39-Attachment Inventory Report ENJ Age.xls”

³⁶ RECO response to RCR-AMI-39, “RCR-AMI-39-Attachment Inventory Report ENJ Age.xls.”

1 **Q. Is the Company proposing to recover these costs?**

2 A. Yes. The depreciation costs are included in the Company's benefit-cost analysis.

3 **Q. Is there any other way the Company could roll out the meters?**

4 A. Yes. The Company could potentially install AMI meters as the existing meters reach the
5 end of their book lives, or even somewhat before. If the Company were to replace only
6 the meters that have currently reached the end of their book lives with AMI, it would be
7 able to replace approximately 36 percent of the meters today. If it also replaced meters
8 that are currently largely depreciated (e.g., meters 20 years old and older) with AMI, it
9 would be able to replace more than half of the meters in Bergen County today.

10 **Q. Would rolling out the meters more slowly reduce the benefits in the near term?**

11 A. Yes, to some degree. However, as noted above, if the Company replaced meters that were
12 currently 20 years old or older, it could replace approximately 55 percent of the meters
13 with AMI today. Taking into account the number of meters that already have Automatic
14 Meter Reading (AMR) capability, the vast majority of meters in Bergen County would
15 have either AMI or AMR, thereby likely enabling the Company to achieve much of the
16 reduction in meter reading payroll that it expects to achieve through its current proposal.

17 **Q. What is AMR?**

18 A. Automatic Meter Reading technology allows data on electricity usage, and in some cases
19 demand, to be collected automatically, either through a drive-by vehicle or walk-by

³⁷ RECO response to RCR-AMI-32, "RCR-AMI-32 Attachment RECO MUP Fin Model.xls."

1 handheld system. According to Itron, a leading metering technology company, AMR may
2 also provide “capabilities like outage notification, demand reset, tamper information and
3 interval datalogging.”³⁸ Thus AMR provides many, but not all, of the benefits of AMI.

4 **Q. How many meters currently have AMR?**

5 A. 14,812 meters (25.5 percent) in Bergen County currently have AMR.³⁹

6 **Q. What percentage of meters would have AMI or AMR under this alternative roll-out
7 option?**

8 A. Approximately 80 percent of meters in Bergen County would have either AMI or AMR if
9 the Company simply replaced meters that were nearing the end of their book lives (20
10 years old or older).⁴⁰ With 80 percent of the meters having either AMI or AMR, the
11 Company would likely reap many of the benefits of the new metering system, without
12 having to replace meters that have many years of useful life remaining.

13 **Q. Has the Company analyzed the cost-effectiveness of such a roll-out or other
14 alternative timelines?**

15 A. It is unclear whether the Company analyzed a roll-out similar to that outlined above, but
16 no such analysis was presented in this docket. It is also far from clear that a five-year
17 timeline would offer the most cost-effective roll-out option. The Company has justified
18 its five-year roll-out timeline only on the basis of avoiding significant bill impacts (that

³⁸ Itron, Solutions: Automatic Meter Reading, available at https://www.itron.com/na/productsAndServices/electricity/Pages/Solutions_Automated-Meter-Reading.aspx

³⁹ RECO response to RCR-AMI-37(d).

⁴⁰ By 2020, the year that the Company proposes to complete the AMI installation, a total of 61 percent of meters would have reached 20 years old or older. Given that more than 25 percent of meters currently have AMR, this implies that nearly 87 percent of meters would have AMI or AMR by 2020 under a five-year rollout scenario.

1 would presumably arise from a faster roll-out), but has not noted overall cost-
2 effectiveness as a factor in its decision to implement the roll-out over a five-year
3 period.⁴¹

4 **Q. Has the Company analyzed alternative options to AMI, such as installing AMR?**

5 A. No. In addition to the question regarding whether the five-year timeline would offer the
6 most cost-effective approach, there remain questions regarding whether investments in an
7 AMR system could achieve many of the same benefits at lower cost. While AMR does
8 not offer all of the same benefits as AMI, Itron claims that an AMR system can also offer
9 benefits such as outage notification, tamper information, and interval data.⁴²

10 Further, it appears that there may be options that would allow for a more gradual, and
11 thus potentially more cost-effective, transition from AMR to AMI. Itron notes that all of
12 its electricity communication modules share the same platform, which allows a utility to
13 later “migrate to a full-featured advanced metering infrastructure (AMI) system”⁴³ as the
14 utility’s needs evolve. As an example, Itron’s CENTRON Bridge Meter would allow it to
15 be installed alongside existing meters and use AMR technology until the utility was
16 prepared to switch to full AMI functionality. According to Itron’s website, when a utility

⁴¹ RECO response to RCR-AMI-18.

⁴² Itron, Solutions: Automatic Meter Reading, available at
https://www.itron.com/na/productsAndServices/electricity/Pages/Solutions_Automated-Meter-Reading.aspx

⁴³ Itron, Solutions: Automatic Meter Reading, available at
https://www.itron.com/na/productsAndServices/electricity/Pages/Solutions_Automated-Meter-Reading.aspx

1 is ready to transition to AMI, a technician simply drives the route and schedules when the
2 utility wants the meters to switch.⁴⁴

3 There are clearly numerous options that could be explored and analyzed to potentially
4 achieve a more cost-effective metering upgrade solution. Despite this potential, the
5 Company states: “Neither the Company nor its consultants has performed a detailed
6 comparison of an AMR system and an AMI system.”⁴⁵

7 **Q. What are your recommendations regarding the analysis of alternatives?**

8 A. I recommend that the Company undertake a thorough analysis of various metering
9 options in order to justify recovery of extraordinary metering costs. This analysis should
10 include several alternatives, such as a partial roll-out that would replace only fully-
11 depreciated or mostly-depreciated meters, as well as options that would utilize only AMR
12 infrastructure or a combination of AMR and AMI. As noted above, given that the primary
13 benefits of AMI and AMR are not storm-related, but rather reductions in day-to-day
14 operating costs, I recommend that these meter upgrade options be considered as part of a
15 base rate case.

⁴⁴ Itron, CENTRON Bridge Meter, available at <https://www.itron.com/na/productsAndServices/Pages/CENTRON%20Bridge%20Meter.aspx?market=electricity#>

⁴⁵ RECO response to RCR-AMI-9.

1 **7. OTHER HARMFUL IMPACTS ON RATEPAYERS**

2 **Q. Please describe the Company’s opt-out charges.**

3 A. The Company proposes to charge any customer who opts out of an advanced meter a
4 monthly service fee of \$15 for manually reading their meter, which equates to \$180 per
5 year. In addition, it appears that any customer that wishes to have an advanced meter that
6 has its data transmitter turned off will be charged a one-time meter change fee of \$135.⁴⁶

7 **Q. How do these charges compare to other jurisdictions?**

8 A. These charges are among the highest in the country, and are generally higher than those
9 the Company reviewed when setting its proposed charges, as evidenced by the table
10 below, provided by the Company in response to RCR-AMI-26.

11 **Table 1. Opt-Out and Meter Change Fees⁴⁷**

Jurisdiction	Company	Monthly Fee	Meter Change Fee
New York	Niagara Mohawk	\$8.51	\$42.61
New York	Central Hudson	\$6.00	\$49.00
Maryland	BG&E	\$11.00	\$75.00
Maryland	Pepco	\$14.00	\$75.00
Maryland	DPL	\$17.00	\$75.00
Maryland	SMECO	\$17.00	\$75.00
California	PG&E	\$15.00	\$90.00
Michigan	Consumers Energy	\$9.72	\$123.91
Average		\$12.28	\$75.69
New Jersey	RECO (proposed)	\$15.00	\$135.00

12

13 In comparison, RECO’s proposed monthly fee is 22 percent higher than the sample
14 average, and its meter change fee is 78 percent higher than the sample average. RECO’s

⁴⁶ RECO Verified Amended and Restated Petition, Meter Upgrade Panel, p. 20, lines 7-8 and lines 18-21.

⁴⁷ RECO response to RCR-AMI-26.

1 proposed opt-out charges thus appear to be excessive and designed to heavily penalize
2 customers who choose to retain their current metering technology.

3 **8. RECOMMENDATIONS**

4 **Q. What do you recommend with regard to the Company's meter upgrade proposal?**

5 A. I recommend that the Board reject the Company's proposal for three reasons:

6 1) The connection with storm hardening is tenuous. The purpose of storm hardening
7 efforts is to support and protect utility infrastructure in order to better withstand
8 major storm events. The meter upgrade would have very few benefits in this
9 regard, reducing outage restoration time by only 0.3 percent. This is not sufficient
10 to justify the extraordinary cost recovery mechanism that the Company has
11 requested for these meters.

12 2) The Company's benefit-cost analysis shows that the AMI costs outweigh the
13 benefits to ratepayers, in terms of the present value of revenue requirements. The
14 Company's proposal should not be approved for this reason, and it should
15 certainly not receive extraordinary cost recovery.

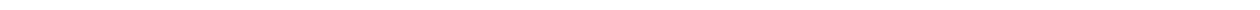
16 3) The Company's proposal would have other detrimental impacts on ratepayers that
17 choose to opt out of the meter upgrade, due to the excessive opt-out fees proposed
18 by the Company.

19 **Q. Does this conclude your direct testimony?**

20 A. Yes, it does.

Schedule TW-1

Resume of Tim Woolf



Tim Woolf, Vice President

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Vice President*, 2011 – present.

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

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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.

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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.

TESTIMONY

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-__): 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.

Resume dated July 2015