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October 20, 2017

***Via Electronic Filing and
Federal Express***

Ms. Martha Lynn Jarvis
Chief Clerk
North Carolina Utilities Commission
430 North Salisbury Street
Dobbs Building
Raleigh, NC 27603-5918

RE: In the Matter of: Application of Duke Energy Progress, LLC
for Adjustment of Rates and Charges Applicable to Electric
Service in North Carolina; ***Docket No. E-2, Sub 1142***

Dear Ms. Jarvis:

Enclosed for filing in the referenced docket is the Testimony of Jonathan Wallach on behalf of The North Carolina Justice Center, North Carolina Housing Coalition, Natural Resources Defense Council, and Southern Alliance for Clean Energy. Pursuant to Commission Rule R1-28(e), we are also submitting fifteen (15) paper copies of the testimony and accompanying exhibits via Federal Express, for delivery on October 23, 2017.

By copy of this letter, I am serving all parties of record on the service list. Please let me know if you have any questions about this filing.

Sincerely,

s/ Robin G. Dunn
Administrative Legal Assistant

RGD
Enclosures
cc: Parties of Record

STATE OF NORTH CAROLINA
BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:)	
)	
Application of Duke Energy Progress, LLC)	Docket No. E-2, Sub 1142
For Adjustment of Rates and Charges)	
Applicable to Electric Service in)	
<u>North Carolina</u>)	

DIRECT TESTIMONY OF
JONATHAN WALLACH
ON BEHALF OF
THE NORTH CAROLINA JUSTICE CENTER, NORTH CAROLINA HOUSING
COALITION, NATURAL RESOURCES DEFENSE COUNCIL, AND SOUTHERN
ALLIANCE FOR CLEAN ENERGY

Resource Insight, Inc.

OCTOBER 20, 2017

1 **I. INTRODUCTION AND SUMMARY**

2 **Q: PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS**
3 **ADDRESS.**

4 A: My name is Jonathan F. Wallach. I am Vice President of Resource Insight, Inc., 5
5 Water Street, Arlington, Massachusetts.

6 **Q: PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.**

7 A: I have worked as a consultant to the electric power industry since 1981. From
8 1981 to 1986, I was a Research Associate at Energy Systems Research Group.
9 In 1987 and 1988, I was an independent consultant. From 1989 to 1990, I was a
10 Senior Analyst at Komanoff Energy Associates. I have been in my current
11 position at Resource Insight since 1990.

12 Over the past four decades, I have advised and testified on behalf of clients
13 on a wide range of economic, planning, and policy issues relating to the
14 regulation of electric utilities, including: electric-utility restructuring; wholesale-
15 power market design and operations; transmission pricing and policy; market-
16 price forecasting; market valuation of generating assets and purchase contracts;
17 power-procurement strategies; risk assessment and mitigation; integrated
18 resource planning; mergers and acquisitions; cost allocation and rate design; and
19 energy-efficiency program design and planning.

20 My resume is attached as Exhibit JFW-1.

21 **Q: HAVE YOU TESTIFIED PREVIOUSLY IN UTILITY PROCEEDINGS?**

22 A: Yes. I have sponsored expert testimony in more than eighty state, provincial,
23 and federal proceedings in the U.S. and Canada. I include a detailed list of my
24 previous testimony in Exhibit JFW-1.
25

1 **Q: ON WHOSE BEHALF ARE YOU TESTIFYING?**

2 A: I am testifying on behalf of the North Carolina Justice Center, North Carolina
3 Housing Coalition, Natural Resources Defense Council, and Southern Alliance
4 for Clean Energy.

5 **Q: ARE YOU SPONSORING ANY EXHIBITS?**

6 A: Yes. I am sponsoring the following exhibits:

- 7 • Exhibit JFW-1: Resume of Jonathan Wallach, Resource Insight, Inc.
8 • Exhibit JFW-2: Citations to Marginal-Price Elasticity Studies

9 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

10 A: On June 1, 2017, Duke Energy Progress, LLC (“DEP” or “the Company”) filed
11 an application (including supporting testimony) for authority to increase electric
12 rates. My testimony responds to supporting testimony by Company witnesses
13 Janice Hager regarding the Company’s cost of service study (“COSS”) and by
14 Steven B. Wheeler regarding the Company’s proposal to increase the monthly
15 basic customer charge for residential customers based on the results of the
16 COSS.¹

17 **Q: PLEASE SUMMARIZE YOUR FINDINGS AND RECOMMENDATIONS.**

18 A: The Company has not justified its proposal to increase the residential basic
19 customer charge. As explained in more detail below, the proposed increase
20 would:

¹ The Company proposes to increase the basic customer charge for Residential Service Schedules RES, R-TOUD, and R-TOU by equal amounts based on the results of the COSS. In addition, DEP proposes to charge Schedule R-TOUD and Schedule R-TOU customers an additional monthly fixed charge to cover the cost of time-of-use meters. I do not address the Company’s proposal with regard to the additional charge for time-of-use meters.

- 1 • Inappropriately shift recovery of load-related costs to the residential basic
2 customer charge.
- 3 • Exacerbate subsidization of high-usage residential customers' costs by low-
4 usage customers, and thereby inequitably increase bills for the Company's
5 smallest residential customers.
- 6 • Dampen price signals to consumers for investing in energy efficiency or
7 distributed renewable generation.

8 Consequently, the Commission should reject the Company's proposal to
9 increase the monthly basic customer charge for residential customers.

10 **Q: HOW IS THE REST OF YOUR TESTIMONY ORGANIZED?**

11 A: In Section II, I describe the Company's proposal for increasing the residential
12 basic customer charge. In Section III, I discuss how the Company's proposal
13 would result in a residential basic customer charge that exceeds actual customer-
14 related cost per residential customer and thereby leads to cost subsidization
15 within the residential class. In Section IV, I explain how the residential basic
16 customer charge proposed by DEP would inappropriately shift recovery of load-
17 related costs from the volumetric energy rate to the basic customer charge and
18 thereby dampen energy price signals. Finally, Section V summarizes my
19 conclusions and recommendations.

20 **II. DEP'S PROPOSAL TO INCREASE THE BASIC CUSTOMER CHARGE**

21 **Q: WHAT IS THE BASIC CUSTOMER CHARGE?**

22 A: The basic customer charge is a fixed fee charged to each customer on their
23 monthly bill regardless of the customer's energy usage during that month.

24

1 **Q: WHAT IS THE COMPANY’S PROPOSAL WITH RESPECT TO THE**
2 **BASIC CUSTOMER CHARGE FOR RESIDENTIAL CUSTOMERS?**

3 A: For residential customers without time-of-use (“TOU”) meters taking service
4 under Residential Service Schedule RES, DEP proposes to increase the basic
5 customer charge from \$11.13 to \$19.50 per customer per month.² The proposed
6 \$8.37 increase represents a 75% increase over the current basic customer charge.

7 For residential customers taking service under either Residential Service
8 Time-of-Use Schedule R-TOUD or Residential Service Time-of-Use Schedule
9 R-TOU, the basic customer charge is currently set at the same rate as for RES
10 customers (\$11.13) plus \$3.00 for TOU meter costs, for a total charge of \$14.13
11 per customer per month. The Company proposes to increase the basic customer
12 charge for these customers by the same amount as proposed for RES customers
13 (\$8.37), but to reduce the adder for TOU meters from \$3.00 to \$2.85.³ The net
14 effect would be to increase the basic customer charge R-TOUD and R-TOU
15 customers from \$14.13 to \$22.35 per customer per month, or by about 58%.

16 **Q: WHAT IS THE COMPANY’S RATIONALE FOR INCREASING THE**
17 **BASIC CUSTOMER CHARGE FOR RESIDENTIAL CUSTOMERS?**

18 A: Company witness Wheeler contends that the Company’s proposal would result
19 in a residential basic customer charge that better reflects the customer-related
20 cost per residential customer, as indicated by the results of the COSS:

² Direct Testimony of *Steven B. Wheeler for Duke Energy Progress, LLC*, Docket No. E-2, Sub 1142, 15 (June 1, 2017) [hereinafter “Wheeler Direct”].

³ *Id.*, 16.

1 DE Progress requests to increase the monthly Basic Customer Charge
2 from \$11.13 to \$19.50 to better recover customer-related cost
3 identified in the unit cost study for the residential rate class. Although
4 the Company's analysis supports increasing the Basic Customer
5 Charge to \$27.82, we have suggested a smaller increase to moderate
6 any affect [*sic.*] on low usage customers.⁴

7 **Q: WHY DOES DEP WANT TO MOVE THE RESIDENTIAL BASIC**
8 **CUSTOMER CHARGE CLOSER TO THE COSS ESTIMATE OF**
9 **CUSTOMER-RELATED COST PER RESIDENTIAL CUSTOMER?**

10 A: The Company offers two justifications for this proposal. First, Mr. Wheeler
11 asserts that increasing the basic customer charge would mitigate purported
12 subsidization of low-usage customers' customer-related costs by larger
13 residential customers.⁵ Second, Mr. Wheeler claims that increasing the
14 residential customer charge to better reflect customer-related embedded costs
15 would improve price signals for promoting economically efficient behavior by
16 residential customers.⁶

17 I address each of these justifications in the following two sections.

18 **III. DEP'S PROPOSAL TO INCREASE THE BASIC CUSTOMER CHARGE**
19 **WOULD EXACERBATE INTRA-CLASS COST SUBSIDIZATION**

20 **Q: WHAT IS THE BASIS FOR MR. WHEELER'S ASSERTION THAT**
21 **INCREASING THE BASIC CUSTOMER CHARGE WOULD MITIGATE**
22 **SUBSIDIZATION WITHIN THE RESIDENTIAL CLASS?**

23 A: Mr. Wheeler relies on the results of the COSS to support this claim. Specifically,
24 Mr. Wheeler reports in his direct testimony that the COSS estimates a customer-

⁴ *Id.*, 15.

⁵ *Id.*, 7.

⁶ DEP response to NCSEA Data Request Item No. 10-9.

1 related cost of \$27.82 per residential customer per month. In other words, the
2 COSS estimates that the “minimum” cost to serve a residential customer – i.e.,
3 the cost to serve a residential customer regardless of that customer’s usage – is
4 \$27.82 per month. With the basic customer charge currently set at \$11.13 per
5 customer per month, the COSS result implies that \$16.69 of the minimum cost to
6 serve a residential customer is currently being recovered through residential
7 volumetric energy rates.

8 If Mr. Wheeler is correct that the COSS reasonably estimates the customer-
9 related cost per residential customer, the remaining \$16.69 of customer-related
10 costs currently being recovered through the volumetric energy rate represents a
11 subsidy payment from customers with above-average usage to those with below-
12 average usage. Specifically, customers with above-average usage would pay
13 more than \$16.69 per month toward recovery of minimum costs through the
14 energy rate, while customers with below-average usage would pay less than
15 \$16.69 per month. Thus, under Mr. Wheeler’s rationale, the Company’s proposal
16 to increase the residential basic customer charge from \$11.13 to \$19.50 would
17 reduce the amount of customer-related costs recovered through the energy rate
18 and thereby reduce the alleged subsidy payment from customers with above-
19 average usage to those with below-average usage.

20 **Q: DO YOU AGREE WITH MR. WHEELER’S CLAIM THAT INCREASING**
21 **THE BASIC CUSTOMER CHARGE WOULD REDUCE**
22 **SUBSIDIZATION OF CUSTOMER-RELATED COSTS WITHIN THE**
23 **RESIDENTIAL CLASS?**

24 A: No. To the contrary, I conclude from a review of the COSS that residential
25 customers with above-average usage are currently being subsidized by customers
26 with below-average usage. Thus, the Company’s proposal would actually

1 *exacerbate* intra-class subsidization – and thereby disproportionately and
2 inequitably increase bills for low-usage customers – by shifting load-related
3 costs inappropriately from high-usage to low-usage customers.

4 **Q: HOW DID YOU ARRIVE AT THIS CONCLUSION?**

5 A: Based on my review, I find that the COSS relies on the results of a minimum
6 system analysis to estimate a customer-related distribution plant cost per
7 residential customer. As discussed below, it is not appropriate to rely on the
8 results of minimum system analyses to estimate *per-customer* minimum plant
9 costs, since such analyses typically overstate the true minimum cost per
10 customer for distribution plant. Correcting for this overstatement, I find that the
11 total customer-related cost per residential customer is less than the amount
12 currently being recovered through the basic customer charge, which indicates
13 that low-usage customers are, in fact, currently subsidizing high-usage
14 customers.

15 **Q: HOW DOES THE COSS DERIVE THE CUSTOMER-RELATED COST**
16 **PER RESIDENTIAL CUSTOMER?**

17 A: In order to allocate costs to customer classes, the COSS first separates total costs
18 into production, transmission, distribution, and customer functions. Costs in each
19 function are then separated into energy-, demand-, or customer-related portions
20 (i.e., classifications) based on whether costs are considered to be “caused” by
21 energy sales, peak demand, or the number of customers, respectively. Finally,
22 costs classified as either energy-, demand-, or customer-related are allocated to
23 customer classes in proportion to each class’s contribution to total-system energy
24 sales, peak demand, or number of customers, respectively.

1 According to Company witness Hager, the cost of meters, service drops,
2 and customer services are deemed to be customer-related in the COSS. In
3 addition, as discussed in detail below, the COSS classifies a portion of pole,
4 conduit, conductor, and secondary transformer costs as customer-related, based
5 on the results of a minimum system analysis of such distribution plant costs.⁷
6 The COSS derives customer-related cost per residential customer by taking the
7 sum of the residential allocation of meter, service-drop, customer-service, and
8 customer-related distribution plant costs and then dividing that sum by the
9 number of residential customers.

10 **Q: PLEASE DESCRIBE THE COMPANY'S MINIMUM SYSTEM**
11 **ANALYSIS OF POLE, CONDUIT, CONDUCTOR, AND SECONDARY**
12 **TRANSFORMER COSTS.**

13 A: The Company's minimum system analysis attempts to estimate the cost to install
14 the same amount of poles, wires, conduits, and transformers as are currently on
15 the distribution system, assuming that each piece of distribution equipment were
16 sized to meet minimal load. In other words, the Company's minimum system
17 analysis attempts to estimate the cost to exactly replicate the configuration of the
18 existing distribution system using minimum-size equipment.

19 In the COSS, the "minimum" portion of distribution plant costs (as
20 determined by the minimum system analysis) is classified as customer-related
21 and then allocated to customer classes in proportion to the number of customers
22 in each class. As discussed above, the customer-related distribution plant cost per
23 residential customer is derived in the COSS as the residential-allocated
24 customer-related plant cost divided by the number of residential customers.

⁷ DEP response to SELC Data Request Item No. 1-11.

1 **Q: IS IT REASONABLE TO RELY ON THE RESULTS OF A MINIMUM**
2 **SYSTEM ANALYSIS TO ESTIMATE THE CUSTOMER-RELATED**
3 **DISTRIBUTION PLANT COST PER CUSTOMER?**

4 A: No. As noted above, the purpose of a minimum system analysis is to determine
5 the portion of distribution plant costs to be allocated to customer classes based
6 on the number of customers in each class. The Company has not offered any
7 evidence that its minimum system analysis also yields reliable estimates of the
8 customer-related distribution plant cost *per customer*.

9 To the contrary, minimum system analyses overstate the minimum plant
10 cost per customer because they assume that a minimum system carrying minimal
11 load would have the same number of poles, conductor-feet, and transformers as
12 currently installed in a distribution system designed to carry actual distribution
13 load. In other words, the minimum system method assumes that each piece of
14 distribution equipment would serve the same number of customers on average,
15 regardless of whether the customers are average-sized (as for the actual system)
16 or have minimal demand (as for the hypothetical minimum system.)

17 This is not a realistic assumption, since even a minimally sized piece of
18 distribution equipment should be able to serve more minimal-demand customers
19 than the number of average-demand customers served by average-sized
20 distribution equipment. Consequently, the true minimum distribution plant cost
21 to serve a customer with minimal usage is likely to be less than that derived
22 using a minimum system analysis. Indeed, since the minimum system method
23 attempts to estimate the plant cost incurred regardless of usage – i.e., the cost to
24 serve load approaching zero, the true minimum plant cost per customer is zero
25 since distribution equipment that carries zero load can serve an infinite number
26 of customers with zero load.

1 **Q: HAS DEP ESTIMATED THE CUSTOMER-RELATED COST PER**
2 **RESIDENTIAL CUSTOMER BASED ON THE TRUE MINIMUM PLANT**
3 **COST PER CUSTOMER?**

4 A: Yes. In response to a data request, DEP modified its COSS to estimate the
5 customer-related cost per residential customer with a zero minimum plant cost
6 per customer.⁸ Specifically, DEP classified all pole, conduit, conductor, and line
7 transformer costs as demand-related for this version of the COSS. This modified
8 COSS therefore includes only the cost of meters, service drops, and customer
9 services in the calculation of customer-related costs. In this case, the modified
10 COSS estimates a customer-related cost per residential customer of \$8.54 per
11 customer per month.

12 To put this in perspective, the current basic customer charge for Schedule
13 RES customers of \$11.13 per month is already about 30% higher than the
14 customer-related embedded cost per customer derived in the modified COSS.

15 **Q: WHAT DOES THIS RESULT TELL US ABOUT COST SUBSIDIZATION**
16 **WITHIN THE RESIDENTIAL CLASS?**

17 A: The fact that the current basic customer charge exceeds the true customer-related
18 embedded cost per residential customer indicates that a sizeable portion of
19 demand-related distribution plant costs are inappropriately being recovered
20 through the current basic customer charge. This means that residential customers
21 with below-average usage currently bear a disproportionate share of demand-
22 related distribution plant costs and consequently subsidize larger customers
23 under current rates, not the other way around as Mr. Wheeler contends.

24

⁸ Supplemental response to SELC Data Request Item No. 1-13.

1 **Q: HOW WOULD THE COMPANY'S PROPOSAL TO INCREASE THE**
2 **BASIC CUSTOMER CHARGE AFFECT COST SUBSIDIZATION**
3 **WITHIN THE RESIDENTIAL CLASS?**

4 A: Since the current basic customer charge already exceeds the true customer-
5 related embedded cost per residential customer, increasing the basic customer
6 charge would increase the amount of demand-related distribution plant costs
7 recovered through the basic customer charge and thereby exacerbate the
8 subsidization of high-usage customers' costs by low-usage customers.
9 Decreasing the basic customer charge, on the other hand, would reduce the
10 subsidy payment from low-usage to high-usage residential customers by shifting
11 demand-related distribution plant costs from the basic customer charge to the
12 volumetric energy rate.

13 **Q: WHAT IS THE EXTENT OF THE INTRA-CLASS SUBSIDIZATION**
14 **UNDER THE COMPANY'S PROPOSAL TO INCREASE THE**
15 **RESIDENTIAL BASIC CUSTOMER CHARGE FROM \$11.13 TO \$19.50?**

16 A: As explained above, the \$8.37 increase in the residential basic customer charge
17 proposed by DEP represents demand-related distribution plant costs that would
18 be recovered from each residential customer every month through a fixed
19 charged on the customer's bill. The COSS assumes about 1.16 million residential
20 customers in the test year, which means that an additional \$116.5 million of
21 demand-related distribution plant costs would be recovered annually through the
22 basic customer charge under the Company's proposal.⁹

23 If the additional demand-related costs recovered through the residential
24 basic customer charge under the Company's proposal were instead recovered

⁹ The number of residential customers assumed in the COSS is provided in NCUC Form E-1 Data Request, Item No. 45(e).

1 through the volumetric energy rate, each residential customer would contribute
2 to recovery of these costs in proportion to their usage. The COSS assumes
3 residential sales in the test year of about 15.5 million megawatt-hours, which
4 means that the additional \$116.5 million of demand-related costs that would be
5 recovered through the basic customer charge under the Company's proposal
6 would be charged at a rate of 0.75¢/kWh if such costs instead continued to be
7 recovered through the energy rate.¹⁰ In that case, a residential customer with
8 monthly usage of 500 kWh would contribute about \$45 per year toward recovery
9 of such costs while a customer with monthly usage of 1,500 kWh would
10 contribute about \$135 per year. Thus, the 1,500 kWh customer would contribute
11 three times more than the 500 kWh customer, in direct proportion to their usage.

12 In contrast, under the Company's proposal to recover an additional \$116.5
13 million of demand-related costs through the basic customer charge, each
14 residential customer would contribute about \$100 per year toward recovery of
15 such costs regardless of that customer's usage. A 500 kWh customer would
16 therefore pay more than double their fair share of these demand-related costs
17 under the Company's proposal while a 1,500 kWh customer would pay about
18 74% of their fair share.

19 **IV. DEP'S PROPOSAL TO INCREASE THE BASIC CUSTOMER CHARGE**
20 **WOULD DAMPEN ECONOMICALLY EFFICIENT PRICE SIGNALS**

21 **Q: WOULD THE COMPANY'S PROPOSAL TO INCREASE THE**
22 **RESIDENTIAL BASIC CUSTOMER CHARGE IMPROVE PRICE**
23 **SIGNALS, AS MR. WHEELER CONTENDS?**

¹⁰ The amount of residential sales assumed in the COSS is provided in NCUC Form E-1 Data Request, Item No. 45(e).

1 A: No. As discussed below, DEP proposes to set the residential basic customer
2 charge at a rate that exceeds the minimum cost to connect a residential customer.
3 The Company's proposal would shift recovery of costs which are appropriately
4 recovered through the volumetric energy rates to the basic customer charge,
5 resulting in an energy rate that understates the extent to which the Company's
6 costs are driven by customer usage. Thus, contrary to Mr. Wheeler's assertion,
7 the Company's proposal would dampen energy price signals and discourage
8 economically efficient behavior by residential customers.

9 **Q: HOW SHOULD RESIDENTIAL ENERGY AND CUSTOMER CHARGES**
10 **BE DESIGNED IN ORDER TO PROVIDE PRICE SIGNALS FOR**
11 **EFFICIENT CUSTOMER BEHAVIOR?**

12 A: Customer charges are intended to recognize that customers contribute equally to
13 certain distribution costs regardless of each customer's energy usage, whereas
14 energy rates recognize that customers of different sizes and load profiles
15 contribute to other distribution, transmission, and generation costs at different
16 levels. If usage-driven costs are inappropriately collected through fixed customer
17 charges, then customers will have reduced incentives to invest in energy
18 efficiency or distributed renewable generation.¹¹

19 Accordingly, volumetric energy rates should be set at levels that recover
20 costs that tend to increase with customer usage. Energy rates should include
21 costs directly driven by customer usage, such as plant, fuel, and operation and
22 maintenance costs. They should also include costs that tend to rise indirectly

¹¹ National Association of Regulatory Utility Commissioners, *Distributed Energy Resources Rate Design and Compensation*, 118 (November 2016), available at <https://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0>.

1 with customer usage level, such as collection costs, uncollectible costs, and some
2 other customer-service costs.

3 In contrast, the customer charge is intended to reflect the cost to connect to
4 the distribution system a customer who uses very little or zero energy.¹² Such
5 “minimum connection costs” are generally limited to plant and maintenance
6 costs for a service drop and meter, along with meter-reading, billing, and other
7 customer-service expenses.¹³

8 **Q: WHAT IS THE MINIMUM COST TO CONNECT A RESIDENTIAL**
9 **CUSTOMER IN THE COMPANY’S SERVICE TERRITORY?**

10 A: As discussed in Section III, DEP estimates a minimum connection cost for
11 residential customers – the cost per residential customer for meters, service
12 drops, and customer services – of \$8.54 per month.

13 **Q: HOW DOES THE COMPANY’S PROPOSED CUSTOMER CHARGE**
14 **COMPARE TO THE MINIMUM CONNECTION COST FOR A**
15 **RESIDENTIAL CUSTOMER?**

16 A: The \$19.50 basic customer charge proposed by DEP is more than double the
17 estimated minimum connection cost. The amount in excess of minimum
18 connection cost represents usage-related costs that are appropriately recovered in
19 the volumetric energy rate. However, under the Company’s proposal, this excess
20 over the minimum connection cost would instead be recovered through the basic
21 customer charge. This shift in the recovery of usage-related costs from the

¹² See, e.g., Jim Lazar & Wilson Gonzalez, *Smart Rate Design for a Smart Future*, Regulatory Assistance Project, 36 (July 2015), available at <http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-gonzalez-smart-rate-design-july2015.pdf>.

¹³ A very small customer in multi-family housing might not require their own service drop. If so, the cost to connect such a customer would not include the cost of a service drop.

1 volumetric energy rate to the basic customer charge would dampen price signals
2 and discourage economically efficient behavior by residential customers.

3 **Q: HOW DOES THE COMPANY'S PROPOSAL TO INCREASE THE BASIC**
4 **CUSTOMER CHARGE TO \$19.50 AFFECT THE SCHEDULE RES**
5 **ENERGY RATE?**

6 A: With the basic customer charge set at \$19.50, I estimate that the annual energy
7 rate would increase to 10.15¢/kWh in order to recover the proposed allocation of
8 adjusted test year revenue requirements to Schedule RES customers.¹⁴ If,
9 instead, the basic customer charge remained at its current rate of \$11.13, the
10 energy rate would have to be increased to 10.92¢/kWh to recover the same
11 allocated revenue requirement.¹⁵ Thus, the energy rate under the Company's
12 proposal to increase the basic customer charge by \$8.37 would be 0.77¢/kWh, or
13 about 7.0%, less than the energy rate without the proposed increase to the basic
14 customer charge.

15 **Q: TO WHAT EXTENT WOULD THE LOWER ENERGY RATE UNDER**
16 **THE COMPANY'S PROPOSAL FOR THE BASIC CUSTOMER**
17 **CHARGE DAMPEN PRICE SIGNALS FOR CONSERVATION?**

18 A: Residential customers respond to the price incentives created by the electrical
19 rate structure. Those responses are generally measured as price elasticities, i.e.,
20 the ratio of the percentage change in consumption to the percentage change in
21 price. Price elasticities are generally low in the short term and rise over several
22 years, because customers have more options for increasing or reducing energy

¹⁴ Based on data provided in response to SELC Data Request Item No. 1-1, I estimate the annual energy rate as the average of the summer and non-summer energy rates proposed by DEP, weighted by the amount of energy sales in the summer and non-summer periods.

¹⁵ *Id.*

1 usage in the medium to long term. For example, a review by Espey and Espey
 2 (2004) of 36 articles on residential electricity demand published between 1971
 3 and 2000 reports short-run elasticity estimates of about -0.35 on average across
 4 studies and long-run elasticity estimates of about -0.85 on average across
 5 studies.¹⁶ In other words, on average across these studies, consumption
 6 decreased by 0.35% in the short term and by 0.85% in the long term for every
 7 1% increase in price.

8 Studies of electric price response typically examine the change in usage as
 9 a function of changes in the marginal rate paid by the customer.¹⁷ Table 1 lists
 10 the results of seven studies of marginal-price elasticity over the last forty years.¹⁸

11 **Table 1: Summary of Marginal-Price Elasticities**

Authors	Date	Elasticity Estimates
Acton, Bridger, and Mowill	1976	-0.35 to -0.7
McFadden, Puig, and Kirshner	1977	-0.25 without electric space heat and -0.52 with space heat
Barnes, Gillingham, and Hageman	1981	-0.55
Henson	1984	-0.27 to -0.30
Reiss and White	2005	-0.39
Xcel Energy Colorado	2012	-0.3 (at years 2 and 3)
Orans et al., on BC Hydro inclining-block rate	2014	-0.13 in 3 rd year of phased-in rate

12

¹⁶ The citation for this study is provided in Exhibit JFW-2.

¹⁷ For Schedule RES customers, that would be the energy rate.

¹⁸ The citations for these studies are provided in Exhibit JFW-2.

1 **Q: WHAT WOULD BE A REASONABLE ESTIMATE OF THE MARGINAL-**
2 **PRICE ELASTICITY FOR CHANGES IN THE RESIDENTIAL ENERGY**
3 **RATE?**

4 A: From Table 1, it appears that -0.3 would be a reasonable mid-range estimate of
5 the impact over a few years.

6 **Q: WHAT WOULD BE A REASONABLE ESTIMATE OF THE EFFECT ON**
7 **ENERGY USE FROM A 7% REDUCTION TO THE SCHEDULE RES**
8 **ENERGY RATE UNDER THE COMPANY'S PROPOSAL TO INCREASE**
9 **THE BASIC CUSTOMER CHARGE?**

10 A: An elasticity of -0.3 and a 7% reduction in marginal energy price would result in
11 an increase in energy consumption of about 2%. This means that all else equal,
12 Schedule RES load would be expected to increase by about 2% over a several-
13 year period as a result of implementing the Company's proposed basic customer
14 charge increase.

15 For comparison, I estimate that the energy savings from the Company's
16 residential energy efficiency programs in both North and South Carolina will
17 increase each year by an amount equivalent to about 0.5% of forecasted annual
18 residential load.¹⁹ Assuming that such savings are spread uniformly across all
19 residential rate classes in the Company's North and South Carolina service
20 territories, the consumption increase due to the Company's proposed increase in
21 its basic customer charge (and the resulting decrease in the energy charge) would

¹⁹ Based on data regarding residential energy efficiency savings for the entire DEP service territory provided in response to SELC Data Request Item No. 1-2 and on data regarding the Company's forecast of residential energy sales for the entire DEP service territory provided in Table C-5 of the 2016 Integrated Resource Plan.

1 undo about four years of Schedule RES energy savings from the residential
2 energy efficiency portfolio.

3 **V. CONCLUSIONS AND RECOMMENDATIONS**

4 **Q: WHAT DO YOU CONCLUDE WITH RESPECT TO THE COMPANY'S**
5 **PROPOSAL TO INCREASE THE RESIDENTIAL BASIC CUSTOMER**
6 **CHARGE TO \$19.50?**

7 A: The Company's proposal would inappropriately shift load-related costs from the
8 volumetric energy rate to the basic customer charge, dampen price signals to
9 consumers for reducing energy usage, disproportionately and inequitably
10 increase bills for the Company's smallest residential customers, and exacerbate
11 the subsidization of larger residential customers' costs by customers with below-
12 average usage. Accordingly, the Commission should reject the Company's
13 proposal to increase the monthly basic customer charge to \$19.50 and instead
14 find that it is reasonable to reduce the monthly charge to \$8.54. In the
15 alternative, the monthly basic customer charge should be maintained at its
16 current level of \$11.13.

17 **Q: DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

18 A: Yes.

CERTIFICATE OF SERVICE

I certify that the parties of record on the service list have been served with the Direct Testimony of Jonathan Wallach on Behalf of the North Carolina Justice Center, North Carolina Housing Coalition, Natural Resources Defense Council, and Southern Alliance for Clean Energy either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 20th day of October, 2017.

s/ Robin G. Dunn

Robin G. Dunn

Qualifications of
JONATHAN F. WALLACH

Resource Insight, Inc.
5 Water Street
Arlington, Massachusetts 02476

SUMMARY OF PROFESSIONAL EXPERIENCE

- 1990–Present* **Vice President, Resource Insight, Inc.** Provides research, technical assistance, and expert testimony on electric- and gas-utility planning, economics, regulation, and restructuring. Designs and assesses resource-planning strategies for regulated and competitive markets, including estimation of market prices and utility-plant stranded investment; negotiates restructuring strategies and implementation plans; assists in procurement of retail power supply.
- 1989–90* **Senior Analyst, Komanoff Energy Associates.** Conducted comprehensive cost-benefit assessments of electric-utility power-supply and demand-side conservation resources, economic and financial analyses of independent power facilities, and analyses of utility-system excess capacity and reliability. Provided expert testimony on statistical analysis of U.S. nuclear plant operating costs and performance. Co-wrote *The Power Analyst*, software developed under contract to the New York Energy Research and Development Authority for screening the economic and financial performance of non-utility power projects.
- 1987–88* **Independent Consultant.** Provided consulting services for Komanoff Energy Associates (New York, New York), Schlissel Engineering Associates (Belmont, Massachusetts), and Energy Systems Research Group (Boston, Massachusetts).
- 1981–86* **Research Associate, Energy Systems Research Group.** Performed analyses of electric utility power supply planning scenarios. Involved in analysis and design of electric and water utility conservation programs. Developed statistical analysis of U.S. nuclear plant operating costs and performance.

EDUCATION

BA, Political Science with honors and Phi Beta Kappa, University of California, Berkeley, 1980.

Massachusetts Institute of Technology, Cambridge, Massachusetts. Physics and Political Science, 1976–1979.

PUBLICATIONS

“The Future of Utility Resource Planning: Delivering Energy Efficiency through Distributed Utilities” (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (460–469). Cleveland, Ohio: USAEE. 1996.

“The Price is Right: Restructuring Gain from Market Valuation of Utility Generating Assets” (with Paul Chernick), *International Association for Energy Economics Seventeenth Annual North American Conference* (345–352). Cleveland, Ohio: USAEE. 1996.

“The Future of Utility Resource Planning: Delivering Energy Efficiency through Distribution Utilities” (with Paul Chernick), *1996 Summer Study on Energy Efficiency in Buildings* 7(7.47–7.55). Washington: American Council for an Energy-Efficient Economy, 1996.

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REPORTS

“Economic Benefits from Early Retirement of Reid Gardner” (with Paul Chernick) prepared for and filed by the Sierra Club in PUC of Nevada Docket No. 11-08019.

“Green Resource Portfolios: Development, Integration, and Evaluation” (with Paul Chernick and Richard Mazzini) report to the Green Energy Coalition presented as evidence in Ontario EB 2007-0707.

“Risk Analysis of Procurement Strategies for Residential Standard Offer Service” (with Paul Chernick, David White, and Rick Hornby) report to Maryland Office of People’s Counsel. 2008. Baltimore: Maryland Office of People’s Counsel.

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“First Year of SOS Procurement.” 2004. Prepared for the Maryland Office of People’s Counsel.

“Energy Plan for the City of New York” (with Paul Chernick, Susan Geller, Brian Tracey, Adam Auster, and Peter Lanzalotta). 2003. New York: New York City Economic Development Corporation.

“Peak-Shaving–Demand-Response Analysis: Load Shifting by Residential Customers” (with Brian Tracey). 2003. Barnstable, Mass.: Cape Light Compact.

“Electricity Market Design: Incentives for Efficient Bidding; Opportunities for Gaming.” 2002. Silver Spring, Maryland: National Association of State Consumer Advocates.

“Best Practices in Market Monitoring: A Survey of Current ISO Activities and Recommendations for Effective Market Monitoring and Mitigation in Wholesale Electricity Markets” (with Paul Peterson, Bruce Biewald, Lucy Johnston, and Etienne Gonin). 2001. Prepared for the Maryland Office of People’s Counsel, Pennsylvania Office of Consumer Advocate, Delaware Division of the Public Advocate, New Jersey Division of the Ratepayer Advocate, Office of the People’s Counsel of the District of Columbia.

“Comments Regarding Retail Electricity Competition.” 2001. Filed by the Maryland Office of People’s Counsel in U.S. FTC Docket No. V010003.

“Final Comments of the City of New York on Con Edison’s Generation Divestiture Plans and Petition.” 1998. Filed by the City of New York in PSC Case No. 96-E-0897.

“Response Comments of the City of New York on Vertical Market Power.” 1998. Filed by the City of New York in PSC Case Nos. 96-E-0900, 96-E-0098, 96-E-0099, 96-E-0891, 96-E-0897, 96-E-0909, and 96-E-0898.

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“Good Money After Bad” (with Charles Komanoff and Rachel Brailove). 1997. White Plains, N.Y.: Pace University School of Law Center for Environmental Studies.

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Bruce Biewald, and David Wise). 1997. Baltimore, Maryland: Maryland Office of People's Counsel.

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"Comments of Public Interest Intervenors on the 1993-1994 Annual and Long-Range Demand-Side Management and Integrated Resource Plans of New York Electric Utilities" (with Ken Keating et al.) 1992.

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“Electricity Market Design: Incentives for Efficient Bidding, Opportunities for Gaming.” NASUCA Northeast Market Seminar, Albany, N.Y., February 2001.

“Direct Access Implementation: The California Experience.” Presentation to the Maryland Restructuring Technical Implementation Group on behalf of the Maryland Office of People’s Counsel. June 1998.

“Reflecting Market Expectations in Estimates of Stranded Costs,” speaker, and workshop moderator of “Effectively Valuing Assets and Calculating Stranded Costs.” Conference sponsored by International Business Communications, Washington, D.C., June 1997.

EXPERT TESTIMONY

- 1989 **Mass. DPU** on behalf of the Massachusetts Executive Office of Energy Resources. Docket No. 89-100. Joint testimony with Paul Chernick relating to statistical analysis of U.S. nuclear-plant capacity factors, operation and maintenance costs, and capital additions; and to projections of capacity factor, O&M, and capital additions for the Pilgrim nuclear plant.
- 1994 **NY PSC** on behalf of the Pace Energy Project, Natural Resources Defense Council, and Citizen's Advisory Panel. Case No. 93-E-1123. Joint testimony with John Plunkett critiques proposed modifications to Long Island Lighting Company's DSM programs from the perspective of least-cost-planning principles.
- 1994 **Vt. PSB** on behalf of the Vermont Department of Public Service. Docket No. 5270-CV-1 and 5270-CV-3. Testimony and rebuttal testimony discusses rate and bill effects from DSM spending and sponsors load shapes for measure- and program-screening analyses.
- 1996 **New Orleans City Council** on behalf of the Alliance for Affordable Energy. Docket Nos. UD-92-2A, UD-92-2B, and UD-95-1. Rates, charges, and integrated resource planning for Louisiana Power & Lights and New Orleans Public Service, Inc.
- 1996 **New Orleans City Council** Docket Nos. UD-92-2A, UD-92-2B, and UD-95-1. Rates, charges, and integrated resource planning for Louisiana Power & Lights and New Orleans Public Service, Inc.; Alliance for Affordable Energy. April, 1996.
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- 1998 **Massachusetts Department of Telecommunications and Energy** Docket No. 97-111, Commonwealth Energy proposed restructuring; Cape Cod Light Compact. Joint testimony with Paul Chernick, January, 1998.
- Critique of proposed restructuring plan filed to satisfy requirements of the electric-utility restructuring act of 1997. Failure of the plan to foster competition and promote the public interest.
- Massachusetts Department of Telecommunications and Energy** Docket No. 97-120, Western Massachusetts Electric Company proposed restructuring; Massachusetts Attorney General. Joint testimony with Paul Chernick, October, 1998. Joint surrebuttal with Paul Chernick, January, 1999.
- Market value of the three Millstone nuclear units under varying assumptions of plant performance and market prices. Independent forecast of wholesale market prices. Value of Pilgrim and TMI-1 asset sales.

- 1999 **Maryland PSC** Case No. 8795, Delmarva Power & Light comprehensive restructuring agreement, Maryland Office of People’s Counsel. July 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Maryland PSC** Case Nos. 8794 and 8808, Baltimore Gas & Electric Company comprehensive restructuring agreement, Maryland Office of People’s Counsel. Initial Testimony July 1999; Reply Testimony August 1999; Surrebuttal Testimony August 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Maryland PSC** Case No. 8797, comprehensive restructuring agreement for Potomac Edison Company, Maryland Office of People’s Counsel. October 1999.
- Support of proposed comprehensive restructuring settlement agreement
- Connecticut DPUC** Docket No. 99-03-35, United Illuminating standard offer, Connecticut Office of Consumer Counsel. November 1999.
- Reasonableness of proposed revisions to standard-offer-supply energy costs. Implications of revisions for other elements of proposed settlement.
- 2000 **U.S. FERC** Docket No. RT01-02-000, Order No. 2000 compliance filing, Joint Consumer Advocates intervenors. Affidavit, November 2000.
- Evaluation of innovative rate proposal by PJM transmission owners.
- 2001 **Maryland PSC** Case No. 8852, Charges for electricity-supplier services for Potomac Electric Power Company, Maryland Office of People’s Counsel. March 2001.
- Reasonableness of proposed fees for electricity-supplier services.
- Maryland PSC** Case No. 8890, Merger of Potomac Electric Power Company and Delmarva Power and Light Company, Maryland Office of People’s Counsel. September 2001; surrebuttal, October 2001. In support of settlement: Supplemental, December 2001; rejoinder, January 2002.
- Costs and benefits to ratepayers. Assessment of public interest.
- Maryland PSC** Case No. 8796, Potomac Electric Power Company stranded costs and rates, Maryland Office of People’s Counsel. December 2001; surrebuttal, February 2002.
- Allocation of benefits from sale of generation assets and power-purchase contracts.
- 2002 **Maryland PSC** Case No. 8908, Maryland electric utilities’ standard offer and supply procurement, Maryland Office of People’s Counsel. Direct, November 2002; Rebuttal December 2002.

Benefits of proposed settlement to ratepayers. Standard-offer service. Procurement of supply.

2003 **Maryland PSC** Case No. 8980, adequacy of capacity in restructured electricity markets; Maryland Office of People's Counsel. Direct, December 2003; Reply December 2003.

Purpose of capacity-adequacy requirements. PJM capacity rules and practices. Implications of various restructuring proposals for system reliability.

2004 **Maryland PSC** Case No. 8995, Potomac Electric Power Company recovery of generation-related uncollectibles; Maryland Office of People's Counsel. Direct, March 2004; Supplemental March 2004, Surrebuttal April 2004.

Calculation and allocation of costs. Effect on administrative charge pursuant to settlement.

Maryland PSC Case No. 8994, Delmarva Power & Light recovery of generation-related uncollectibles; Maryland Office of People's Counsel. Direct, March 2004; Supplemental April 2004.

Calculation and allocation of costs. Effect on administrative charge pursuant to settlement.

Maryland PSC Case No. 8985, Southern Maryland Electric Coop standard-offer service; Maryland Office of People's Counsel. Direct, July 2004.

Reasonableness and risks of resource-procurement plan.

2005 **FERC** Docket No. ER05-428-000, revisions to ICAP demand curves; City of New York. Statement, March 2005.

Net-revenue offset to cost of new capacity. Winter-summer adjustment factor. Market power and in-City ICAP price trends.

FERC Docket No. PL05-7-000, capacity markets in PJM; Maryland Office of People's Counsel. Statement, June 2005.

Inefficiencies and risks associated with use of administratively determined demand curve. Incompatibility of four-year procurement plan with Maryland standard-offer service.

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Inefficiencies and risks associated with use of administratively determined demand curve. Effect of proposed reliability-pricing model on capacity costs.

2006 **Maryland PSC** Case No. 9052, Baltimore Gas & Electric rates and market-transition plan; Maryland Office of People's Counsel, February 2006.

Transition to market-based residential rates. Price volatility, bill complexity, and cost-deferral mechanisms.

Maryland PSC Case No. 9056, default service for commercial and industrial customers; Maryland Office of People's Counsel, April 2006.

Assessment of proposals to modify default service for commercial and industrial customers.

Maryland PSC Case No. 9054, merger of Constellation Energy Group and FPL Group; Maryland Office of People's Counsel, June 2006.

Assessment of effects and risks of proposed merger on ratepayers.

Illinois Commerce Commission Docket No. 06-0411, Commonwealth Edison Company residential rate plan; Citizens Utility Board, Cook County State's Attorney's Office, and City of Chicago, Direct July 2006, Reply August 2006.

Transition to market-based rates. Securitization of power costs. Rate of return on deferred assets.

Maryland PSC Case No. 9064, default service for residential and small commercial customers; Maryland Office of People's Counsel, Rebuttal Testimony, September 2006.

Procurement of standard-offer power. Structure and format of bidding. Risk and cost recovery.

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Distorting effects of proposed reliability-pricing model on clearing prices. Economically efficient alternative treatment.

Maryland PSC Case No. 9063, optimal structure of electric industry; Maryland Office of People's Counsel, Direct Testimony, October 2006; Rebuttal November 2006; surrebuttal November 2006.

Procurement of standard-offer power. Risk and gas-price volatility, and their effect on prices and market performance. Alternative procurement strategies.

Maryland PSC Case No. 9073, stranded costs from electric-industry restructuring; Maryland Office of People's Counsel, Direct Testimony, December 2006.

Review of estimates of stranded costs for Baltimore Gas & Electric.

2007 **Maryland PSC** Case No. 9091, rate-stabilization and market-transition plan for the Potomac Edison Company; Maryland Office of People's Counsel, Direct Testimony, March 2007.

Rate-stabilization plan.

Maryland PSC Case No. 9092, rates and rate mechanisms for the Potomac Electric Power Company; Maryland Office of People's Counsel, Direct Testimony, March 2007.

Cost allocation and rate design. Revenue decoupling mechanism.

Maryland PSC Case No. 9093, rates and rate mechanisms for Delmarva Power & Light; Maryland Office of People's Counsel, Direct Testimony, March 2007.

Cost allocation and rate design. Revenue decoupling mechanism.

Maryland PSC Case No. 9099, rate-stabilization plan for Baltimore Gas & Electric; Maryland Office of People's Counsel, Direct, March 2007; Surrebuttal April 2007.

Review of standard-offer-service-procurement plan. Rate stabilization plan.

Connecticut DPUC Docket No. 07-04-24, review of capacity contracts under Energy Independence Act; Connecticut Office of Consumer Counsel, Joint Direct Testimony June 2007.

Assessment of proposed capacity contracts.

Maryland PSC Case No. 9117, residential and small-commercial standard-offer service; Maryland Office of People's Counsel. Direct and Reply, September 2007; Supplemental Reply, November 2007; Additional Reply, December 2007; presentation, December 2008.

Benefits of long-term planning and procurement. Proposed aggregation of customers.

Maryland PSC Case No. 9117, Phase II, residential and small-commercial standard-offer service; Maryland Office of People's Counsel. Direct, October 2007.

Energy efficiency as part of standard-offer-service planning and procurement. Procurement of generation or long-term contracts to meet reliability needs.

2008 **Connecticut DPUC 08-01-01**, peaking generation projects; Connecticut Office of Consumer Counsel. Direct (with Paul Chernick), April 2008.

Assessment of proposed peaking projects. Valuation of peaking capacity. Modeling of energy margin, forward reserves, other project benefits.

Ontario EB-2007-0707, Ontario Power Authority integrated system plan; Green Energy Coalition, Penimba Institute, and Ontario Sustainable Energy Association. Evidence (with Paul Chernick and Richard Mazzini), August 2008.

Critique of integrated system plan. Resource cost and characteristics; finance cost. Development of least-cost green-energy portfolio.

2009 **Maryland PSC** Case No. 9192, Delmarva Power & Lights rates; Maryland Office of People's Counsel. Direct, August 2009; Rebuttal, Surrebuttal, September 2009.

Cost allocation and rate design.

Wisconsin PSC Docket No. 6630-CE-302, Glacier Hills Wind Park certificate; Citizens Utility Board of Wisconsin. Direct and Surrebuttal, October 2009.

Reasonableness of proposed wind facility.

PUC of Ohio Case No 09-906-EL-SSO, standard-service-offer bidding for three Ohio electric companies; Office of the Ohio Consumers' Counsel. Direct, December 2009.

Design of auctions for SSO power supply. Implications of migration of First-Energy from MISO to PJM.

2010 **PUC of Ohio** Case No 10-388-EL-SSO, standard-service offer for three Ohio electric companies; Office of the Ohio Consumers' Counsel. Direct, July 2010.

Design of auctions for SSO power supply.

Maryland PSC Case No. 9232, Potomac Electric Power Co. administrative charge for standard-offer service; Maryland Office of People's Counsel. Reply, Rebuttal, August 2010.

Proposed rates for components of the Administrative Charge for residential standard-offer service.

Maryland PSC Case No. 9226, Delmarva Power & Light administrative charge for standard-offer service; Maryland Office of People's Counsel. Reply, Rebuttal, August 2010.

Proposed rates for components of the Administrative Charge for residential standard-offer service.

Maryland PSC Case No. 9221, Baltimore Gas & Electric cost recovery; Maryland Office of People's Counsel. Reply, August 2010; Rebuttal, September 2010; Surrebuttal, November 2010

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Wisconsin PSC Docket No. 3270-UR-117, Madison Gas & Electric gas and electric rates; Citizens Utility Board of Wisconsin. Direct, Rebuttal, Surrebuttal, September 2010.

Standby rate design. Treatment of uneconomic dispatch costs.

Nova Scotia UARB Case No. NSUARB P-887(2), fuel-adjustment mechanism; Nova Scotia Consumer Advocate. Direct, September 2010.

Effectiveness of fuel-adjustment incentive mechanism.

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Assessment of drought-related financial risk.

2011 **Mass. DPU 10-170**, NStar–Northeast Utilities merger; Cape Light Compact. Direct, May 2011.

Merger and competitive markets. Competitively neutral recovery of utility investments in new generation.

Mass. DPU 11-5, -6, -7, NStar wind contracts; Cape Light Compact. Direct, May 2011.

Assessment of utility proposal for recovery of contract costs.

Wisc. PSC Docket No. 4220-UR-117, electric and gas rates of Northern States Power: Citizens Utility Board of Wisconsin. Direct, Rebuttals (2) October 2011; Surrebuttal, Oral Sur-Surrebutal November 2011;

Cost allocation and rate design. Allocation of DOE settlement payment.

Wisc. PSC Docket No. 6680-FR-104, fuel-cost-related rate adjustments for Wisconsin Power and Light Company: Citizens Utility Board of Wisconsin. Direct, October 2011; Rebuttal, Surrebuttal, November 2011

Costs to comply with Cross State Air Pollution Rule.

2012 **Maryland PSC** Case No. 9149, Maryland IOUs' development of RFPs for new generation; Maryland Office of People's Counsel. March 2012.

Failure of demand-response provider to perform per contract. Estimation of cost to ratepayers.

PUCO Cases Nos. 11-346-EL-SSO, 11-348-EL-SSO, 11-349-EL-AAM, 11-350-EL-AAM, transition to competitive markets for Columbus Southern Power Company and Ohio Power Company; Ohio Consumers' Counsel. May 2012

Structure of auctions, credits, and capacity pricing as part of transition to competitive electricity markets.

Wisconsin PSC Docket No. 3270-UR-118, Madison Gas & Electric rates, Wisconsin Citizens Utility Board. Direct, August 2012; Rebuttal, September 2012.

Cost allocation and rate design (electric).

Wisconsin PSC Docket No. 05-UR-106, We Energies rates, Wisconsin Citizens Utility Board. Direct, Rebuttal, September 2012.

Cost allocation and rate design (electric).

Wisconsin PSC Docket No. 4220-UR-118, Northern States Power rates, Wisconsin Citizens Utility Board. Direct, Rebuttal, October 2012; Surrebuttal, November 2012.

Recovery of environmental remediation costs at a manufactured gas plant. Cost allocation and rate design.

2013 **Corporation Commission of Oklahoma** Cause No. PUD 201200054, Public Service Company of Oklahoma environmental compliance and cost recovery, Sierra Club. Direct, January 2013; rebuttal, February 2013; surrebuttal, March 2013.

Economic evaluation of alternative environmental-compliance plans. Effects of energy efficiency and renewable resources on cost and risk.

Maryland PSC Case No. 9324, Starion Energy marketing, Maryland Office of People's Counsel. September 2013.

Estimation of retail costs of electricity supply.

Wisconsin PSC Docket No. 6690-UR-122, Wisconsin Public Service Corporation gas and electric rates, Wisconsin Citizens Utility Board. Direct, August 2013; Rebuttal, Surrebuttal September 2013.

Cost allocation and rate design; rate-stabilization mechanism.

Wisconsin PSC Docket No. 4220-UR-119, Northern States Power Company gas and electric rates, Wisconsin Citizens Utility Board. Direct, Rebuttal, Surrebuttal, October 2013.

Cost allocation and rate design.

Michigan PSC Case No. U-17429, Consumers Energy Company approval for new gas plant, Natural Resources Defense Council. Corrected Direct, October 2013.

Need for new capacity. Economic assessment of alternative resource options.

2014 **Maryland PSC** Cases Nos. 9226 & 9232, administrative charge for standard-offer service; Maryland Office of People's Counsel. Reply, April 2014; surrebuttal, May 2014.

Proposed rates for components of the Administrative Charge for residential standard-offer service.

Conn. PURA Docket No. 13-07-18, rules for retail electricity markets; Office of Consumer Counsel. Direct, April 2014.

Estimation of retail costs of power supply for residential standard-offer service.

PUC Ohio Cases Nos. 13-2385-EL-SSO, 13-2386-EL-AAM; Ohio Power Company standard-offer service; Office of the Ohio Consumers' Counsel. Direct, May 2014.

Allocation of distribution-rider costs.

Wisc. PSC Docket No. 6690-UR-123, Wisconsin Public Service Corporation electric and gas rates; Citizens Utility Board of Wisconsin. Direct, Rebuttal, August 2014; Surrebuttal, September 2014.

Cost allocation and rate design.

Wisc. PSC Docket No. 05-UR-107, We Energy biennial review of electric and gas costs and rates; Citizens Utility Board of Wisconsin. Direct, August 2014; Rebuttal, Surrebuttal September 2014.

Cost allocation and rate design.

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