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October 23, 2015

Luly E. Massaro
Clerk
Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

In Re: Review of Electric Distribution Design Pursuant to R.I.G.L. § 39-26.6-24
Docket No. 4568

Dear Luly:

Enclosed for filing are an original and 9 copies of the direct testimony of Caroline Golin on behalf of The Alliance for Solar Choice in this matter.

If you have any questions, please feel free to call.

Very truly yours,

Leah

Leah J. Donaldson

MRMc:tmg
cc: Service List

Alliance Motion to Intervene2

Docket No. 4568 National Grid's Rate Design Pursuant to R.I. Gen. Laws Sec 39-26.6-24
Service List updated 10/14/15

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PRE-FILED DIRECT TESTIMONY

OF

CAROLINE GOLIN

ON BEHALF OF THE ALLIANCE FOR SOLAR CHOICE

OCTOBER 23, 2015

TABLE OF CONTENTS

I. INTRODUCTION

Q. PLEASE STATE FOR THE RECORD YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A. My name is Caroline Golin. I am the CEO and principal consultant of the consulting and analysis firm, The Greenlink Group. My business address is 565 Harold Ave, Atlanta, GA 30307.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND

A. I have a Masters in Civil and Environmental Engineering from Georgia Institute of Technology and I am finishing a PhD in Energy Policy from Georgia Institute of Technology, with a focus on modeling the system and environmental impacts of shifts in energy and water use to incorporate customer-cited distrusted resources.

Q. PLEASE DESCRIBE YOUR EXPERIENCE AND QUALIFICATIONS.

A. My experience and qualifications are described in my *curriculum vitae*, attached as **TASC Exhibit CG-1**. As reflected in my *curriculum vitae*, I have been researching and publishing on the electricity industry for nearly a decade. Recently, my research has focused on analyzing the impacts of state regulatory policy and utility programs for distributed generation, including net metering and value of solar programs. As a PhD candidate at Georgia Tech, I also founded The Greenlink Group, where I focus my consulting practice on energy issues and have developed analysis or testimony before numerous state regulatory commissions and utility proceedings in Georgia, Tennessee, South Carolina, and Virginia. My CV includes a list of the research I have conducted and the testimony I have sponsored in various state regulatory proceedings concerning electric and gas utilities, including distribution rate cases and proceedings involving net metering or value of solar programs.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. No.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of The Alliance for Solar Choice ("TASC"). Founded by the largest rooftop solar companies in the United States, TASC advocates across the country to defend state policies, such as net metering, that provide fair credit to residents, businesses, churches, schools, and public agencies when those customers' rooftop solar systems export power to a utility's grid.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to inform the Commission of the negative consequences of the proposals by the Company to impose a tiered customer charge for Residential Rate A-16 and Small Commercial and Industrial (C&I) Rate C-06 customers. The Company's proposal for a tiered customer charge is a combination of a fixed charge and a demand charge based on non-coincident peak. Fixed charges have multiple negative consequences for customers, including:

- Disincentivizing energy efficiency;
- Encouraging unnecessary utility spending; and
- Penalizing distributed generation customers

Non-coincident peak demand charges are also inappropriate and ineffective rate mechanisms to recover distribution costs, as they:

- Do not align customer costs with utility costs;
- Do not give customers the correct signals about how to manage their energy use effectively; and
- Disproportionately penalize distributed generation customers.

Additionally, my testimony highlights the fact that the Company has failed to substantiate the need for a rate change or that the proposed rate change is in line with the Renewable Energy Growth program.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS TO THE COMMISSION.

A. I recommend the Commission:

- Reject the proposal due to lack of analysis and the deficiencies of fixed charges and non-coincident peak demand charges;
- Utilize existing programs to study customer demand patterns and utility costs more thoroughly;
- Pursue smarter rate design mechanisms; and
- Maintain equity and transparency by addressing all rate change proposals through a formal rate case.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I identify broadly the negative consequences of fixed charges, highlighting how fixed charges stand in contradiction to many principles outlined in the Renewable Energy Growth Program as well as utility industry best practices for smart rate design.

Next, I specifically examine the implications of the proposed use of tiered customer charges and demand charges for Residential Rate A-16 and Small Commercial and Industrial Rate C-06. I will look at the provisions relating to future rate design, the impact on distributed energy resources, and the evidence presented in an attempt to substantiate a shift in the cost of service. I recognize the effort the Company expended in crafting the proposed tiered rate design, but I am concerned about the precedent such an approach could set for cost recovery practices moving forward. I believe the Commission should prioritize smarter rate mechanisms for recovering utility costs that are equitable for all customer classes, informed by emerging best practices in the rate design mechanisms for the recovery of distribution costs. Tiered customer charges, structured as a fixed charge and demand charge, are not reflective of smart rate design mechanisms, disproportionately penalize customers with distributed energy resources, and are unwarranted.

Finally, I recommend that the Commission should maintain a tradition of transparency and equity when handling any amendment to customer rates. Given the precedent that the proposed rate changes could set for cost recovery moving forward, as well as the integration of distributed generation, I recommend that any changes to customer rates be rejected, on in the alternative implementation of customer charges should be handled through the Company's next full rate case.

II. BACKGROUND

Q. WHY WAS THIS PROCEEDING COMMENCED?

A. In 2014, the Legislature enacted the Renewable Energy Growth Program Act[1] to provide greater availability of grid-connected generation of renewable energy for Rhode Island customers, and to further facilitate the growth of distributed generation that the Distributed Generation Standard Contracts Act[2] began. As required by the Renewable Energy Growth Program Act, on July 1, 2015, the Commission opened this docket to consider rate design and distribution cost allocation among rate classes in light of net metering and the changing distribution system that is expected to include more distributed energy resources, including distributed generation.

Q. DID THE ACT GIVE THE COMMISSION ANY GUIDING PRINCIPLES TO CONSIDER NATIONAL GRID'S PROPOSAL IN THIS CASE?

A. Yes. The Act requires the Commission to take into account and balance the following factors in establishing new rates in this proceeding:

(1) The benefits of distributed energy resources;

(2) The distribution services being provided to distributed generation customers when the distributed generation is not producing electricity;

(3) Simplicity, understandability, and transparency of rates to all customers, including non-net metered and net-metered customers;

[1] R.I. Gen. Laws Ch. 39-26-6.
[2] R.I. Gen. Laws Ch. 39-26-2.

(4) Equitable ratemaking principles regarding the allocation of the costs of the distribution system;

(5) Cost causation principles;

(6) The General Assembly's legislative purposes in creating the distributed generation growth program; and

(7) Any other factors the PUC deems relevant and appropriate in establishing a fair rate structure for all of the Company's customers.[3]

Q. WHAT IS NATIONAL GRID PROPOSING IN THIS CASE?

Motivated by the concern that distributed generation customers are not adequately contributing to the cost of distribution services and that increased amounts of distributed generation will create a cross-subsidy between distributed generation customers and non-distributed generation customers, the Company is proposing a rate change, including an increased customer charge and demand charge, to ensure recovery of costs related to distribution and customer service. The Company has also proposed an "Access Fee" for stand-alone distributed generators, but I will not be addressing the Access Fee at this time.[4]

III. PRINCIPLES OF RATE DESIGN

Q. ARE THERE BROADER CONSIDERATIONS OF RATE DESIGN THAT SHOULD INFORM THIS PROCEEDING?

[3] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 10.
[4] Per the Commission's October 16, 2015 Revised Procedural Schedule, intervenor testimony addressing the Access Fee is due on November 23, 2015.

A. Yes. As recognized by the Company, there are long-standing principles of rate design typically considered by regulatory agencies charged with setting rates for electricity.[5] While such principles are useful and relevant to the task at hand, the Commission should recognize that the principles cited by the Company—put forth by James C. Bonbright—were developed during the 1960's, well before the emergence of distributed generation, renewable energy policies, and the monitoring tools needed to produce a refined estimate of utility costs.

Q. DO THESE TRADITIONAL PRINCIPLES OF RATE DESIGN REQUIRE SOME ADJUSTMENT TO ACCOUNT FOR NEW TECHNOLOGIES AND TRENDS IN CUSTOMER ADOPTION OF DISTRIBUTED GENERATION?

A. Yes. With the changing nature of the grid and advancements in technology, much attention has been given to the role of rate design and its impact on the choices made by customers, utilities, and other electric market participants. More specifically, the literature has focused on how certain rate mechanisms can either encourage or discourage electricity usage, more efficient utility investments, and the market for distributed generation and energy efficiency. Smart rate design has always been founded on mechanisms that send the correct price signals to customers. Moving forward, smart rate design must work in concert with technological innovations and institutional changes. By embracing smart rate design, Rhode Island will maintain the principles of the Renewable Energy Growth Program, industry competitiveness, transparency, and ensure the promotion of customer choice and market ingenuity.

[5] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 19.

Q. WHAT ADJUSTMENTS TO BONBRIGHT'S PRINCIPLES DO YOU RECOMMEND HERE TO ACHIEVE SMART RATE DESIGN FOR THE MODERN GRID?

A. In addition to the tenets put forward by Bonbright, smart rate design for the modern grid should:

- Be based on long-run marginal costs;
- Reflect time and locational cost differences;
- Allow for customers to connect to the grid for no more than the cost of connection;
- Focus on the usage components of service which are the most cost- and price sensitive;
- Be comprehensible to the customer;
- Send the correct price signals about usage and consumption patterns;
- Fairly compensate customers who supply power to the grid at the power's full value;
- Allow for competition within the market for both generation and ancillary services;
- Maintain fairness to all customer classes and subclasses;
- Maximize the value of new technologies as they become available; and
- Set economically efficient prices that are forward-looking and lead to the optimum allocation of utility and customer resources.

Q. HOW, SPECIFICALLY, HAVE TECHNOLOGY ADVANCEMENTS CHANGED RATE DESIGN?

A. With the development of advanced metering and monitoring technologies and advanced methods for accurately appropriating the costs of generating and distributing electricity, many utilities now have the opportunity to craft rate mechanisms that correctly characterize the different costs of electricity service. Furthermore, advanced metering and monitoring technologies assist in the integration of distributed generation, allow the utility to deliver more reliable service, and produce an operational savings that can been realized by all customers. Utilities and customers are provided with the correct information to mitigate service costs and bills. This is a very different scenario from when most utilities first established rate structures.

Q. DO THESE CHANGES IMPACT THE ROLE OF THE REGULATOR IN SETTING RATES FOR CONSUMPTION OF ELECTRICITY?

A. Now, more than ever, the regulator's role in rate design is critical to achieving the objectives of optimizing a smarter, more modern grid. Today's regulator is tasked with insuring that any rate changes made by the utility are done so with customer preferences in mind, advance the long-term interests of ratepayers, ensure competition in the marketplace, are forward-looking, and most closely align rates with utility costs and send the correct price signals to customers. Furthermore, as recognized by the Regulatory Assistance Project[6], "Rate design signals public priorities about short-term and long-term economics, including especially the type and pace of future resource procurements."[7]

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[6] The Regulatory Assistance Project is anon-profit team of experts focused on the long-term economic and environmental sustainability of the power and natural gas sectors, providing assistance to government officials on a broad range of energy and environmental issues.
[7] Lazar, J. and Gonzalez, W. (2015). Smart Rate Design for a Smart Future. Montpelier, VT: Regulatory Assistance Project. (pg. 23) Available at: http://www.raponline.org/document/download/id/7680.

Q. "DOES THE COMPANY'S PROPOSAL REFLECT THESE PRINCIPLES OF SMART RATE DESIGN FOR A MODERN GRID?"

A. No. The Company's proposal does not reflect the principles of smart rate design. By shifting cost recovery to a fixed cost structure it limits customer's ability to control their energy use and sends incorrect price signals to customers about the cost of service.

Q. DO YOU AGREE WITH THE ASSERTION THAT DISTRIBUTION COSTS ARE FIXED COSTS?

A. No. I fully recognize the need for utilities to recover infrastructure costs related to distribution. I do not believe anyone would disagree with the Company's statement that, "all customers who are connected to the distribution system (i.e., customers with distributed generation, customers without distributed generation, and directly connected distributed generation facilities), should contribute their fair share to the utility's costs to operate, maintain, and invest in the distribution system that is relied upon by all connecting customers."[8] But it is important to recognize basic economics - all utility costs are variable over the long run. Even a cost traditionally regarded as fixed, such as the investment cost for an electric transformer, is variable depending on the load and nature of load on the electric system where it operates. Variations in energy and demand impact the actual short-term and long-term costs of the transformer as well as the need to invest in new distribution infrastructure. Strategically-deployed distributed generation resources such as demand response, conservation, and solar photovoltaics can all defer the replacement or extend the useful life of such equipment.

[8] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 18.

Approaching rate design as though investment costs associated with distribution infrastructure are fixed investments and therefore necessitate fixed charges is false. Treating distribution costs as fixed costs can also create a disincentive to the utility and customer investments in distributed energy resources, which, over the long run, would be the more cost-effective option for distribution planning.

IV. FIXED CHARGES

Q. WHAT ARE THE NEGATIVE IMPACTS OF FIXED CUSTOMER CHARGES?

A. It is widely accepted in the rate design literature that the use of fixed customer charges to recover distribution system costs are neither cost-based nor economically efficient.[9] Fixed charges send the wrong price signals to customers and to grid operators for long-term planning and often hold negative consequences for customers. These negative consequences include discouraging energy conservation, discouraging the development of distributed energy resources, and encouraging unnecessary generation investments.

Q. HOW DO FIXED CHARGES IMPACT ENERGY EFFICIENCY?

A. **Fixed charges discourage energy efficiency**. With a fixed charge representing a higher portion of the bill, the customers have less incentive to consume only the power needed because

[9] *See., e.g.,* Gyamfi, S., Krumdieck, S., & Urmee, T. (2013). Residential peak electricity demand response—Highlights of some behavioural issues. *Renewable and Sustainable Energy Reviews*, *25*, 71-77; Lazar, J. and Gonzalez, W. (2015). Smart Rate Design for a Smart Future. Montpelier, VT: Regulatory Assistance Project. (pg. 23) Available at: http://www.raponline.org/document/download/id/7680; Steven Nadel and Garrett Herndon (2014) The Future of the Utility Industry and the Role of Energy Efficiency. ACEEE Research Report U1404 JUNE 10, 2014.

they are charged a high fixed rate regardless of their power usage. For example, the Kansas Corporation Commission examined the impact of fixed charges on energy use. Researchers found that increased fixed charges in Kansas would increase electricity use by 1.1 – 6.8%, varying by utility and season.[10] While this increase may seem small, such an increase is greater than all the energy savings from all energy efficiency programs in the state.[11] This change in rate structure and consumption would offset the financial benefits of decades of energy efficiency efforts and penalize customers who have already successfully invested in energy efficiency under previous rate structures.

Q. HOW DO FIXED CHARGES IMPACT CUSTOMER-OWNED DISTRIBUTED ENERGY RESOURCES, SUCH AS SOLAR PHOTOVOLTAICS?

A. **Fixed charges disincentivize the development of customer-owned distributed energy resources, such as solar photovoltaics, and result in a missed opportunity for utility interests**. For example, a new study from the Rocky Mountain Institute, *The Economics of Grid Defection*, showed that fixed charges can create delays in a customer's return on investment for solar and distributed energy resources - even a small fixed charge can delay the payback of solar by several years. Therefore, implementing fixed charges will result in a missed opportunity for utilities to align the interests of solar and storage owners with those of the grid at large.[12]

[10] Daniel G. Hansen Michael T. O'Sheasy (2012). Residential Rate Study for the Kansas Corporation Commission Final Report. Christensen Associates Energy Consulting, LLC April 11, 2012.
[11] Steven Nadel and Garrett Herndon (2014) The Future of the Utility Industry and the Role of Energy Efficiency. ACEEE Research Report U1404 JUNE 10, 2014.
[12] RMI – Rocky Mountain Institute, February 2014. The Economics of Grid Defection When and Where Distributed Solar Generation plus Storage competes with traditional utility service. Rocky Mountain Institute, Boulder Colorado, USA (pg. 39) http://www.rmi.org/electricity_grid_defection.

Q. IS THERE ANY EVIDENCE THAT FIXED CHARGES ARE REQUIRED TO ASSURE THAT CUSTOMERS WITH DISTRIBUTED GENERATION CUSTOMERS PAY THEIR "FAIR SHARE" OF THE FIXED COSTS OF THE GRID?

A. No. The Company is claiming that since customers with distributed generation are significantly reducing the kWhs they consume, they therefore avoid paying for their fair share of the fixed cost of the grid. While I will return to examine this specific point more thoroughly, I want to highlight that there is no research justifying this claim, in Rhode Island or throughout the country. On the contrary, recent research has shown that solar customers do in fact pay their fair share of system costs. A recent report calculated that commercial and residential customers actually paid 133% of their full cost of service, with the residential customer class paying 154% of its cost. After installing distributed solar generation, both classes were mitigating these subsidies but were still paying over 100% of utilities' cost to serve these customers.[13]

Furthermore, as supported by the Renewable Energy Growth Program, the question of whether distributed energy resources impose costs to the utility should be met with a review of the benefits that such resources provide for the utility.

Q. DO CUSTOMERS WITH DISTRIBUTED GENERATION REDUCE DISTRIBUTION SYSTEM COSTS FOR UTILITIES?

A. Yes. Distributed energy resources decrease distribution system costs for utilities. For example, the Rocky Mountain Institute's study, *The Economics of Grid Defection*, has shown

[13] California Public Utilities Commission. October 2013. *California Net Energy Metering Ratepayer Impacts Evaluation.*(pg. 10) http://www.cpuc.ca.gov/NR/rdonlyres/75573B69-D5C8-45D3-BE22-3074EAB16D87/0/NEMReport.pdf.

that distribution grid operators' distributed energy resource customers with solar and battery systems provide value to the grid by providing reduced peak demand, upgrade deferrals, congestion relief, and the provision of ancillary services.[14] This is consistent with other studies by utility regulators that have found the value of distributed solar exceeds the cost of distribution.[15] At low levels of installation of distributed generation, few if any physical modifications are required to electric distribution systems.

Q. DO FIXED CHARGES HAVE THE POTENTIAL TO IMPACT UTILITY BEHAVIOR?

A. Yes. **Fixed charges encourage unnecessary spending by the utility**. One of the greatest consequences of fixed charges is that they direct utilities away from smarter pricing and smarter investment. Similar to how fixed charges encourage customers to consume more, they also encourage utilities to build more, rather than building smarter. This is only further exacerbated by the discouragement of energy efficiency and the use of customer distributed generation, which are usually the most cost effective means for reducing generation investment. As recognized by the Company, utilities have built capacity and distribution systems, and structured rates off their ability to ensure peak demand is always met, even for rare moments. This approach has consistently resulted in the utilities' overbuilding capacity, as shown in Figure 1. This means that much of what the Company is referring to actually represents over-capacity.

[14] RMI – Rocky Mountain Institute, February 2014. The Economics of Grid Defection When and Where Distributed Solar Generation plus Storage competes with traditional utility service. Rocky Mountain Institute, Boulder Colorado, USA http://www.rmi.org/electricity_grid_defection.
[15] Maine Public Utilities Commission (2015) Maine Distributed Solar Valuation Study. 127th Maine LegislatureMarch1, 2015. http://www.maine.gov/mpuc/electricity/elect_generation/documents/MainePUCVOS-ExecutiveSummary.pdf.

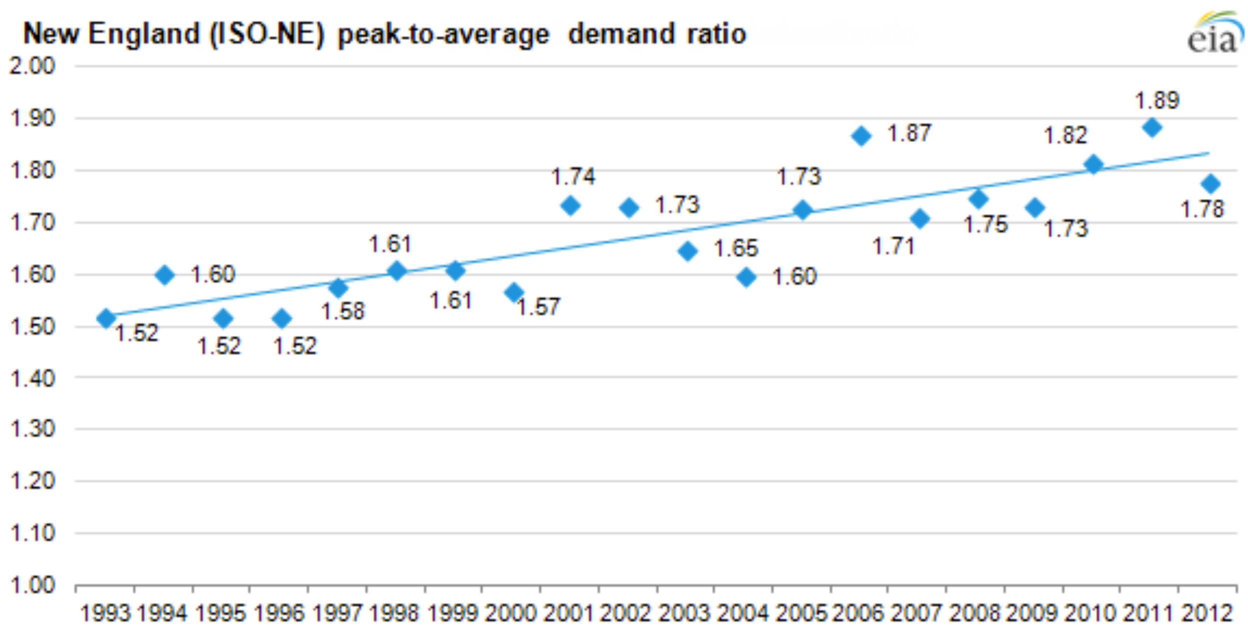

Figure 1. New England (ISO-NE) peak-to-average demand ratio.

****A ratio of 1.78 means that peak demand is 78% higher than average demand. A higher ratio indicates a lower asset-utilization rate (source: EIA)***

Q. DO FIXED CHARGES SEND THE PROPER SIGNAL TO CUSTOMERS REGARDING THE CONSEQUENCE OF THEIR USAGE ON GRID COSTS?

A. No. Fixed charges signal to customers that increasing their peak energy use does not result in capacity costs for the utility, either in the short run or the long run. Actually, this pricing fails to capture the need for utilities to always ensure peak capacity or maintain reserve capacity. Without the proper price signals for customers, consumption could increase in all periods, including the peak. As peak loads grow, the utility will add more capacity, both generation and distribution capacity, to ensure meeting peak demand. These investment costs will be passed on to customers. As a result, the customer is paying for an investment that could have been avoided if they had better information about the cost of peak energy use and the cost of maintaining peak capacity.

Q. ARE THERE ANY ADDITIONAL IMPACTS OF FIXED CHARGES?

A. Yes. There are additional, indirect consequences of fixed charges. Weakening the incentive to invest in efficiency and distributed generation not only costs the customer more but also has negative impacts for the economy and the environment. For years, studies have shown that energy efficiency and renewable energy result in greater job creation per dollar invested (locally and nationally) than receiving the same energy services from the centralized system.[16] As investments in energy efficiency and distributed generation decrease, so too will the creation of local jobs and the benefits of pollution reduction.

Q. PLEASE SUMMARIZE THE NEGATIVE IMPACTS OF FIXED CUSTOMER CHARGES.

A. In summary, fixed customer charges do not reflect the tenets of smart rate design or the principles of the Renewable Energy Growth Program as they are not cost-based, equitable, and do not account for the value of distributed generation. Fixed charges hamper existing price signals and create the wrong incentive structure. Without proper price signals, customers cannot recognize the value of energy efficiency and distributed energy resources. As a result, distributed

[16] *See, e.g.,* Deitchman, B. (2014). Beyond Recovery- Policy Options for Energy Efficiency Financing. World Energy Engineering Congress October 2014.; Baer, Paul, Marilyn A. Brown, and Gyungwon Kim. (2015); "The Job Generation Impacts of Expanding Industrial Cogeneration," *Ecological Economics,* 110: 141-153; http://www.peri.umass.edu/236/hash/294809398e497bee9c8abe6ac7df2bdc/publication/466/.

energy resources become less competitive and distributed energy resource providers would see little reward for innovating and delivering solutions to customers. Fixed charges perpetuate wasteful consumption by the consumer, inevitably produce wasteful capacity investments by utilities, and discourage cost-effective grid investments needed by distribution utilities, customers and entrepreneurs to modernize the grid.

Q. IS INCREASED RELIANCE ON FIXED CHARGES GENERALLY FAVORED OR DISFAVORED BY REGULATORS AND RATEPAYER ADVOCATES?

A. Increased reliance on fixed charges is generally disfavored by ratepayer advocates[17] and regulators. For example, the Sierra Club, Minnesota Center for Environmental Advocacy, Fresh Energy, Natural Resources Defense Council (NRDC), and the Izaak Walton League—Midwest Office, among others, recently challenged a request by Xcel Energy to increase the customer charge on its Minnesota residential customers by $1.25. An administrative law judge rejected Xcel's request, finding that the increased charge would both impede conservation and harm low-income customers. Additionally, the judge found flaws in the underlying cost of service study and Xcel's interpretation of that study in making its fixed charge proposal.[18] Commissions in Idaho and Utah have also rejected proposals for fixed charges on solar customers because of insufficient data.[19]

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[17] *See* TASC Exhibit CG-3 (Resolution of the National Association of State Utility Consumer Advocates Opposing Gas and Electric Utility Efforts to Increase Delivery Service Customer Charges).
[18] *See* Docket No. E-002/GR-13-868 Before the Minnesota Public Utilities Commission, Order issued May 8, 2015.
[19] See, e.g., PacifiCorp dba Rocky Mountain Power 2014 General Rate Case. DOCKET NO. 13-035-184. at 66 ("Based on our review of the record in this proceeding, we conclude the evidence is inconclusive, insufficient, and inadequate to make a determination under Utah Code Ann. § 54- 15-105.1(1) whether costs PacifiCorp or its customers will incur from the net metering program will exceed the benefits of the net metering program, or whether the benefits of the net metering program will exceed the costs. Thus, we cannot conclude that the proposed net metering facilities charge is just and reasonable under Utah Code Ann. § 54-15-105.1(2), and we decline to approve

Q. DOES THE COMPANY'S PROPOSAL SIGNAL AN INCREASED RELIANCE ON FIXED CHARGES?

A. Yes.

V. RESIDENTIAL DEMAND CHARGES

Q. IS THE COMPANY'S TIERED CUSTOMER CHARGE PROPOSAL ESSENTIALLY A DEMAND CHARGE THAT WILL APPLY TO RESIDENTIAL CUSTOMERS?

A. Yes. The Company has divided its customer charge into four tiers, each tier corresponding to a different level of usage. However, while the customer tiers are determined by total energy usage (i.e how many kWh's a customer uses) the customer charges are derived to account for customer's peak demand (i.e the single highest kW ever needed by the customer). I should point out, that because the Company does not have sufficient data on customer's usage patterns, and therefore cannot determine individual's peak demand, it has approximated customers' peak demand based on its average demand patterns. This approximation is the basis for the customer charge.

Q. WHAT ARE THE DRAWBACKS OF RESIDENTIAL DEMAND CHARGES?

A. Demand charges in the residential sector generally do a poor job of sending the correct price signals to customers. It is increasingly recognized that the use of demand charges in the

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the charge at this time."); Order No. 32846, Case No. IPC-E-12-27, Before the Idaho Public Utilities Commission (issued July 3, 2013).

residential sector are poor mechanisms of recovering distribution costs and more research needs to be conducted before utilities pursue and residential demand charge rate structure.[20]

Q. ARE DEMAND CHARGES CONSISTENT WITH "SMART RATE DESIGN" FOR THE MODERN GRID?

A. No. Historically, demand charges have been implemented for commercial and industrial customers who often required individual distribution-level infrastructure, and where advanced metering was unavailable. But demand charges are inappropriate for residential customers as they do not send the correct price signals on the costs of service. There are better rate mechanisms, such as time-of-use rates, for aligning customers' bills with the cost of service. Pursuing a strategy with smart meters and advanced monitoring technology is one path that would better prepare the Company for the modern grid and establish the foundation necessary to implement smart rate design.

Q. UTILITIES TEND TO ARGUE THAT DEMAND CHARGES ARE A PREFERABLE MEANS OF RECOVERING DISTRIBUTION COSTS FROM CUSTOMERS, BUT THESE CHARGES HAVE HISTORICALLY NOT BEEN APPLIED TO RESIDENTIAL CUSTOMERS. WHY ARE DEMAND CHARGES NOT WELL SUITED FOR THE RECOVERY OF DISTRIBUTION COSTS FROM RESIDENTIAL CUSTOMERS?

[20] Lazar, Jim. 2013. Electric Utility Residential Customer Charges and Minimum Bills: Alternative Approaches for Recovering Basic Distribution Costs.

A. Demand charges are not well suited for the recovery of distribution costs for the residential sector for a number of reasons. To start, the only distribution system component sized to individual customer demands is the final line transformer, a relatively small portion of the cost of service. Nationally, on average, this cost amounts to only about $1/ kW/month.[21] Unlike large commercial or industrial customers, there are multiple residential customers per transformer with different demand profiles and usage profiles, meaning that customers' peak demand period may not coincide with system or local circuit peak. However, in general, demand or capacity-related costs, to the extent they are incurred, are primarily associated with the system peak demand (coincident peak), not the individual customer peak demand (non-coincident). [22]

If demand charges are measured on the basis of the individual customer's peak, regardless of whether it coincides with the peaks on any portion of the system, this means a customer is charged the same rate whether they use power in times of high demand (adding to system peak and utility costs) or low demand (when utility costs are correspondingly lower). Such an approach inevitably results in a mismatch between the costs incurred to serve the customer and the prices charged to the customer. This approach is referred to as a non-coincident peak demand charge and is the rate mechanism currently being proposed by the Company. Simply put, there is a mismatch in the cost and the bill. The cost recovery that is needed by

[21] Lazar, J. and Gonzalez, W. (2015). Smart Rate Design for a Smart Future. Montpelier, VT: Regulatory Assistance Project. Available at: http://www.raponline.org/document/download/id/7680.

[22] A *coincident demand charge* is based on a customer's peak demand when the system as a whole is at peak demand. This charge reflects the demand the customer places on the system as a whole, from generation of electricity to its transmission and delivery to the customer. When the system is already at its peak, what increment of capacity is needed to meet this customer's demand?
A *noncoincident demand charge* is based on a customer's peak demand at any time. If a customer's overall peak demand occurs when the system is at peak demand, that customer's coincident and noncoincident demand are the same. If a customer's peak demand occurs when there is spare system capacity, the noncoincident demand charge largely reflects the cost of the final delivery of electricity to the customer.

utilities is determined by the system coincident peak costs. But under the proposed rate change, a customers' bill would be determined by a customers' individual, potentially non-coincident peak.

Q. HOW DO DEMAND CHARGES NEGATIVELY IMPACT DISTRIBUTED GENERATION CUSTOMERS?

A. Demand charges can result in a disproportionately negative impact distributed generation customers. Distributed generation customers may in fact consistently reduce the draw on the grid during system peak times, however, if their individual, annual daily peak demand occurs during non-sunlight hours, or on a day with cloud cover on a non-peak day, they will likely be charged as if they had no regular beneficial impact on system coincident peak.[23] The result is that distributed generation customers who are consistently contributing less, proportionately, to the system peak, bear a greater share of distribution costs, while those who are contributing more to the system peak bear a lesser share of the costs. The Company claims to support the growth of distributed generation and that the proposed rates are designed to be fair, equitable, and "create a distinct incentive for customers to conserve their use of energy."[24] Under the proposed methodology it seems unclear how the demand charges will incentivize distributed generation; rather, it is poised to penalize an entire class of distributed generation customers.

[23] The California Public Utilities Commission recently held that even demand charges for maximum demand during on-peak periods tend not to accurately credit solar generation for its reduction to system peaks, as a solar customer's on-peak period maximum demand might occur on a cloudy day, which is unlikely to be near the system peak day. D.14-12-080, Docket No. A.12-12-002 Before the California Public Utilities Commission (issued December 3, 2012).
[24] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 13-14.

VI. EVALUATION OF PROPOSED RATE CHANGES

Q. WHAT IS YOUR PRIMARY CONCERN WITH THE COMPANY'S PROPOSED RATE CHANGES?

A. First, as part of my testimony I want to recognize the Company's forethought in crafting the proposed customer charge. Specifically, I want to draw attention to the Company's recognition of the need for fairness. The Company's goal is to ensure that "the bill impact on any individual customer will be no more than +/- five percent annually," and that no changes will be made to the Low Income Rate A-60 (Rate A- 4 60).[25] However, the fact that the Company is proposing to defer the handling of rate changes to a formal rate case for Low Income customers, but not the other customer classes, raises questions of fairness. My primary concerns are that one, the assertion that DG customers are somehow creating a cost shift for distribution cost recovery is unsubstantiated; two, the use of fixed charges and demand charges are deficient rate mechanisms and should not set precedent for cost recovery and utility planning moving forward, and three, that the manner in which the Company is pursuing an amendment to rate design is neither transparent nor equitable.

Q. IS THE COMPANY'S TIERED CUSTOMER CHARGE PROPOSAL CONSISTENT WITH THE STATE'S OVERALL RENEWABLE ENERGY POLICY?

A. No. The current proposed rate design sets a precedent for cost recovery moving forward that is both contrary to the principles of the Renewable Energy Growth Act and to industry best practices. The Company's proposal does not account for the benefits of distributed energy

[25] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 29.

resources, is not transparent or substantiated, and is not reflective of the General Assembly's legislative purposes in creating the Renewable Energy growth program- specifically the advancement of and investment in distributed generation. The goal of the commission should be to move utilities towards optimal rate designs that align customer decision-making and utility planning, and do not penalize customers or prohibit them for making investments and behavior changes that can provide value to the grid.

Q. IS THE PROPOSED RATE DESIGN IN LINE WITH THE TENETS OF SMART RATE DESIGN?

A. No. The Company says that a foundational tenet of smart rate design is the prudent recovery of utility costs. However, the Company has not substantiated a loss in cost recovery or provided evidence that any gap in cost recovery is a result of greater proliferation of distributed energy resources. Smart rate design requires the analysis of customer class and sub-class demand patterns. The Company's justification for the introduction of fixed charges is to ensure cost recovery from distributed generation customers and insure that other customers are not subsidizing distributed generation customers' grid use.

Q. DOES THE COMPANY PRESENT ANY EVIDENCE TO SHOW THAT DISTRIBUTED GENERATION CUSTOMERS ARE BEING SUBSIDIZED BY CUSTOMERS WITHOUT DISTRIBUTED GENERATION?

A. No. In order for the Company to justify an amendment to cost recovery mechanisms, it is necessary to show that distributed generation customer's demand patterns have actually caused a gap between their impact on system infrastructure and their contribution to its costs. While it is apparent that the Company has studied the demand patterns of its residential and small commercial customers to derive a demand charge from unmetered energy use, they have not shown that current distributed generation customers are in fact forcing the Company towards a situation where prudent cost recovery is not obtainable. Nor have they shown that any current cross-subsidization is occurring. The Company should provide evidence of this gap before any rate change could be seriously considered by the Commission.

Q. HOW DOES THE CURRENT LEVEL OF DISTRIBUTED GENERATION IN RHODE ISLAND IMPACT THE NEED TO INVESTIGATE WHETHER THIS GAP IN COST RECOVERY EXISTS AND TO INSTITUTE RATE CHANGES?

A. In the first instance, the existence of a gap is highly unlikely and therefore, any shift in rate design is premature given the low level of distributed generation penetration and the Company's current handling of distributed generation. The Company expresses concerns about impacts of distributed generation to the distribution system, both technical and financial. The primary concern seems to be that distributed generation customers, by choosing to reduce their own consumption of electricity, are not adequately contributing to the costs incurred in maintaining the distribution network to account for peak demand. The logic of this argument only holds if, 1) the level of penetration of distributed generation is a substantial portion of an individual feeder's generation profile and if, 2) the distributed generation is largely invisible to the system operators. According to the Company, the total *Estimated Annual Generation* from

Residential and Commercial distributed generation was right under 2.5 million kWh.[26] To put this in perspective, this amounts to the total annual electricity consumption of one high-rise office building. [27] This is hardly at a level to warrant any substantial concerns about system-wide technical or financial impacts. Furthermore, The Company estimated that in 2014 that the total annual lost delivery service revenue from distributed generation customers was approximately $760,932.[28] According to data from the United States Energy Information Administration, (form EIA-826), the Company's total sales revenue for Rhode Island accounted to $828,858,982. Without considering the benefits of distributed generation, this would indicate that the share of loss of revenue from distributed generation customers in 2014 was roughly .0009%.

Q. DO YOU BELIEVE THE COMPANY'S PROPOSED RATE CHANGE IS JUSTIFIED AT THIS TIME?

A. No. The current proposal is not a result of a thorough technical and economic evaluation of distributed generation's current impact on distribution costs, but is the Company's attempt to preemptively insulate itself from any future, hypothetical lost revenue or unmet distribution cost recovery. According to the Company, Rhode Island is projected to have 205 total MW of distributed solar generation on the system by 2020, the majority as a result of the Renewable

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[26] National Grid's Response to Public Utilities Commission's First Set of Data Requests (PUC 1-5), issued on August 14, 2015, attached as TASC Exhibit CG-2.
[27] This is based on a 150,000 sq ft office building with an annual energy intensity of 15 kWh per sq/ft. using the 2012 EIA Commercial Building Energy Consumption Survey (CBECS), *available at* http://www.eia.gov/consumption/commercial/data/2012/.
[28] TASC Exhibit CG-2. Note that the estimation was extracted without the use of any metered data and assumes that the generation profile of each unit is equivalent to on-site consumption. This assumption likely overestimates the annual revenue lost as it likely assumes a higher consumption profile of its customers from the onset.

Energy Growth Program.[29] The Renewable Energy Growth Program requires participants to register their on-site load to be separately metered from generation and customers are compensated through a Performance Based Incentive Program. As a result, there is no revenue loss associated with displaced kWh deliveries for projects under the program.

Additionally, the Renewable Energy Growth Program's annual solicitations do not end until 2021, at which point only standard behind-the-meter[30] net metering will be available to compensate future distributed generation customers. This means that the Company has five years before any potential concerns regarding rate recovery of distributed generation customers would be realized. With the Renewable Energy Growth Program's multiyear rollout, it will be possible to incrementally monitor progress; the Company should not implement deficient rate mechanisms prematurely. There is adequate time to prepare the Company up for smarter rate design and the incorporation of larger amounts of distributed generation.

Q. DOES THE CURRENT RATE PROPOSAL ADHERE TO THE TENETS OF THE RENEWABLE ENERGY GROWTH PROGRAM?

A. No. In keeping with the legislative purpose of the Renewable Energy Growth Program, any assessment of distributed generation's impacts on the distribution system should be couched in a larger analysis, including multiple stakeholders, that quantifies both the costs as well as benefits of distributed energy resources. Before justifying a rate change to recover the costs of distributed generation on the distribution system, there needs to be recognition of the benefits the

[29] Joint Pre-filed Direct Testimony of Peter T. Zschokke and Jeanne A. Lloyd, at 40.
[30] Behind The Meter system is a renewable energy generating facility that produces power intended for on-site use in a home, office building, or other commercial facility. The location of the system is literally "Behind The Meter", on the owner's property, not on the side of the electric grid/utility.

distributed generation brings to the distribution system. It has been widely recognized throughout the utility industry and research literature, that distributed energy resources, including distributed solar generation, can decrease costs related to distribution and ancillary services.[31] By reducing peak demand, distributed generation reduces a utility's need to invest in new generation capacity and reduces associated operations and maintenance costs. Additionally, reduced net feeder demand relieves stress on existing distribution infrastructure, potentially deferring distribution capacity upgrades.[32]

Synapse Energy Economics recently analyzed the impacts of installing net-metered rooftop distributed solar generation equivalent to 0.5% of Mississippi's historical peak demand, finding net-metered solar can help avoid significant infrastructure investments.[33] Additionally, because distributed solar generation directly reduces peak demand, it also avoids the costs of the additional reserve margins. Distributed solar generation also reduces distribution and transmission losses and assists with voltage management, service reduction, and conservation voltage reduction.[34] There are numerous additional benefits to distributed solar generation beyond the distribution system, including pollutant reductions, fuel price reduction, market price reductions, and environmental compliance, among others.[35] Distributed solar generation should

[31] Hansen, Lacy, and Glick (2013) Rocky Mountain Institute: A Review of PV PV Benefit and Cost Studies: Second Edition Hansen 2013
[32] For a resource to provide distribution capacity relief, it must be available during peak load periods when feeder assets are most constrained and capacity becomes the limiting factor. The ability for intermittent DER, such as PV, to reduce feeder peak demand may abate at high penetration levels if the load peak shifts outside the time of PV. (Epri 2014)
[33] Synapse Energy Economics(2014) *Net Metering in Mississippi Costs, Benefits, and Policy Considerations Prepared for the Public Service Commission of Mississippi*. September 19, 2014. http://www.synapse-energy.com/sites/default/files/Net%20Metering%20in%20Mississippi.pdf.
[34] Hoff, Norris and Perez (2012) *The Value of Distributed Solar Electric Generation to New Jersey and Pennsylvania*, Table ES-2 and pages 18-19.
[35] *See* "Benefits and Costs of Solar Generation for Ratepayers in North Carolina," (Crossborder Energy) October 18 2013, *available at*

be analyzed in terms of ability to provide capacity during peak load periods when assets are most constrained and when feeder capacity is a limiting factor.

Q. HOW DO THE PROPOSED RATE CHANGES IMPACT DISTRIBUTED GENERATION CUSTOMERS?

A. The proposed demand charges, based on non-coincident peak demand, also disproportionately penalize distributed generation customers. As noted previously, the primary problem with imposing a non-coincident peak demand charge on distributed generation customers is that it in fact does not result in an increase in customers' price elasticity (where a change in price is matched by a corresponding change in consumption). The Company argues that demand charges are a better reflection of distribution costs and send the correct price signals to consumers. This assertion implies that with the imposition of demand charges, distributed generation customers will exhibit some form of elasticity response to the change in price structure. But under non-coincident peak demand charges, that are based on annual peak demand, what distributed generation customers are charged for the grid system is not reflective of their use of that system, leaving DG customers with no clear relationship between their use of the system and the costs they incur.[36]

This disconnect confuses the means by which customers might effectively respond to price signals, harming the ability of markets to convey information and creating more inelastic behaviors. The greater the inelasticity, the more that any increase in rates is simply the

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http://energync.org/assets/files/Benefits%20and%20Costs%20of%20Solar%20Generation%20for%20Ratepayers%20in%20North%20Carolina%282%29.pdf.

[36] DG customers are load factor customers. These are customers whose peak demand is high relative to their average use. As a result, a low load factor customer's peak use is not reflective of their average use.

Company's attempt to capture and extract rents from its customer base. Furthermore, given that the Company does not meter either the generation of the distributed generation unit or the onsite consumption of net metered customers[37] it does not seem to me that the Company could accurately calculate annual lost revenue from distributed generation customers.

Q. DOES THE PROPOSED RATE CHANGE INCENTIVIZE THE GROWTH OF DISTRIBUTED GENERATION?

A. No. It is unclear how the company's proposal to extract rents from distributed generation customers, will not incentivize distributed generation, as it claims. On the contrary, under the current proposal, the average residential or small commercial solar customer will see a decrease in monthly and annual savings, which will negatively impact the return on investment for new distributed solar generation customers, especially in the first year of installment under the net metering tariff.[38] My analysis shows that under s direct-build scenario, the current proposal would increase the total system cost for a residential customer by $2,000 and result in a 30% decrease in the Net Present Value (See Table 1). Essentially, the proposed fixed charge will add another two years to the payback of an average residential photovoltaic system. Under a Levelized Cost of Energy[39] model, the return on investment for distributed solar generation customers in the first year decreases by nearly 40%. As a result, these rate designs decrease the

[37] TASC Exhibit CG-2.
[38] The ROI analysis is analyzing the compensation under net metering tariff and not the RE-Growth program. Given that the RE Growth program is only valid through 2020, the analysis focuses on the long-term mechanisms for DG expansion in Rhode Island.
[39] Levelized Cost of Energy is the Net Cost to install a renewable energy system divided by its expected life-time energy output.

long-term competitiveness of distributed generation and inhibit the growth of distributed generation systems to residential and small commercial customers.

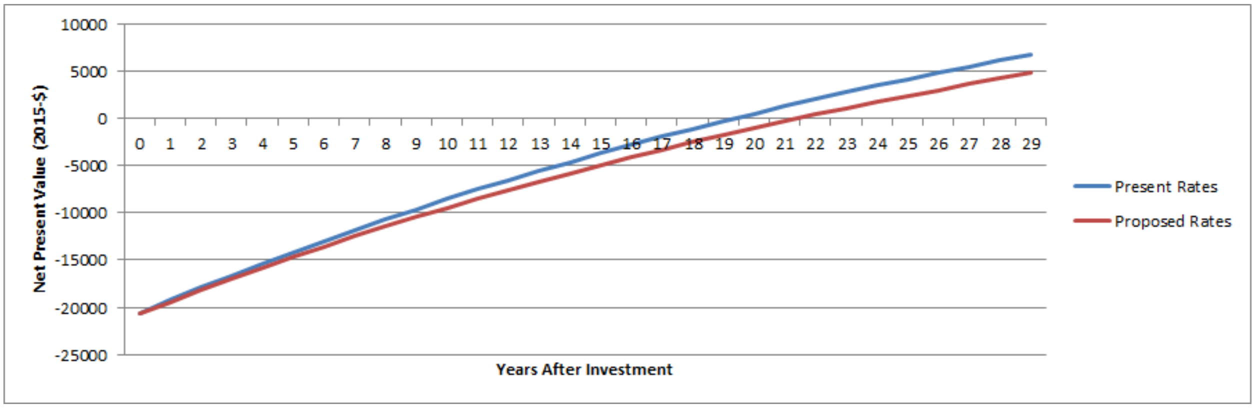

Figure 1. Comparison of the Net Present Value of a Residential Solar Facility

<u>VII. ALTERNATIVE RATE MECHANISMS</u>

Q. WHAT IS A SMARTER, ALTERNATIVE APPROACH TO DEMAND CHARGES FOR RESIDENTIAL CUSTOMERS?

A. A smarter approach would be to first better study customer usage, then examine multiple rate mechanisms, and pursue one that better aligns customer bills with the cost of service. One option is to pursue the use of time-varying rates, such as time-of-use or hourly ("real-time") pricing structures. Time-of-use rates vary the price depending on the time-of-day when electricity is provided, to better reflect the dynamic cost of service. In their simplest form, time-of-use rates communicate to customers that the cost to produce and deliver electricity is much higher during peak hours than off-peak hours. For example, time-of-use customers receive the correct signal that turning up an air conditioner on a hot summer afternoon increases the cost and need for new capacity over the long run. In their most complex form, they provide a full picture of the hourly cost to produce and deliver electricity and give greater control to consumers to shift their behavior based on their needs and investment decisions.[40] Time-of-use pricing can also be a powerful incentive for the smarter integration of distributed energy resources, such as distributed solar generation, that reduce peak loads, resulting in both customer and utility savings. This is because solar panels tend to operate at their highest capacity during summer months and during peak load hours.

However, whatever rate mechanism is pursued, it should be done so in a forum that allows for multiple stakeholders and the exploration of different approaches, supported by rigorous analysis.

VIII. RECOMMENDATIONS

Q. WHAT IS YOUR RECOMMENDATION TO THE COMMISSION REGARDING THE COMPANY'S PROPOSED TIERED CUSTOMER CHARGE?

A. My primary recommendation to the Commission is that the proposed customer charge be rejected in its entirety. This recommendation is based on the evidence that non-coincidence demand charges are deficient rate mechanisms for the residential sector; that fixed charges result in substantial negative impacts for customers; and the proposal sets a precedence of increased reliance on fixed charges. Alternatively, I would recommend that the Commission maintain transparency and any consideration of the rate design be taken within a general rate case.

[40] Borenstein, S., & Holland, S. P. (2003). On the efficiency of competitive electricity markets with time-invariant retail prices, 36(3), 469–493. *available at* http://www.jstor.org.ezpprod1.hul.harvard.edu/stable/4135226.

Q. WHAT ARE YOUR RECOMMENDATIONS TO BETTER ALIGN THE PROPOSED RATE CHANGES WITH THE RE GROWTH PROGRAM?

A. As part of the Renewable Energy Growth Program annual filing requirement in 2016, the Company will be evaluating the impact of distributed generation to the distribution grid and the use of localized credits in 2016 for locations where distributed generation would be helpful to the distribution system. The Company is also collecting data related to distributed solar generation's impact on the distribution system from its Demandlink pilot.[41] I recommend that the Commission explore and correctly quantify any costs imposed by distributed generation customers related to the distribution system and weigh them against benefits, before moving forward with changes in rate design.

Q. DO YOU HAVE ANY CONCERNS WITH THE PRECEDENTIAL NATURE OF THE COMPANY'S PROPOSAL?

A. Yes. The Company has stated that it intends to use fixed charges and demand charges moving forward, as opposed to pursuing smarter rate design and investing in better monitoring (smart meters, data collection) so as to better prepare the Company for the future. If the Commission approves the proposal, the Commission would be effectively setting the use of fixed

[41] Since 2012, National Grid has been conducting an SRP pilot called "DemandLink" in Tiverton and Little Compton. This pilot is designed to defer the need for a new substation feeder in the Tiverton/Little Compton region through at least 2017 by targeting energy efficiency measures and conducting a demand response program in the area that will reduce the load on specific feeders attributable to customer air conditioning, lighting, and other summer-peaking loads. If the pilot is successful in enrolling and providing 1 megawatt (MW) of sustained load relief over its planned lifecycle, it will result in deferred construction of a new substation feeder estimated to cost $2.9 million for four years. See: https://www.myngrid.com/demandlink.

charges and deficient demand charges as precedent for rate design, and doing so without the necessary analysis to substantiate their imposition.

Q. DO YOU RECOMMEND THAT THE COMMISSION AUGMENT THE TRADITIONAL PRINCIPLES OF RATE DESIGN IN CONSIDERATION OF THE MODERN GRID?

A. Yes. As the Company has recognized frequently, the nature of the electric industry is changing and the historical model for rate design is becoming increasingly inefficient and ineffective. The responsibility of the Commission to ensure that rate design is forward-looking is more critical then ever before. The Company's proposal to implement fixed charges and demand charges is contrary to smart rate design practices and to the legislative purpose of the Renewable Energy Growth Act. If the Commission adopts the Company's proposal, the Commission would establish a foundation for rate design moving forward that is both deficient and discriminatory, and is based not on the empirical but on the hypothetical. Opting for fixed charges and minimizing volumetric pricing destroys pricing signals, hurts low-income customers, encourages inefficiency, promotes wasteful grid investments, and impedes utilities from integrating and taking advantage of valuable distributed generation sources, such as solar.

National Grid and Rhode Island are known for being leaders in grid modernization and in the integration of renewable resources, so it is only fitting that their approach to rate design be forward-thinking and considered. As opposed to instituting unfair and shortsighted pricing mechanisms, The Company should pursue rate mechanisms that better align customer bills with the cost of service and more accurately capture the benefits and costs of the grid and all resources – including distributed generation. By doing so the commission will create a better pathway for the ensuring utility cost recovery as the grid continues to evolve to meet customer demands and satisfaction. Therefore, I recommend that the proposal should be rejected in its entirety. Alternatively, I recommend that the Commission maintain the values of equity and transparency in considering any change regarding rates or fees by addressing this proposal through a formal rate case. Any proposal to amend the current rate design, should be handled in a venue where multiple stakeholders are present, substantive analysis is required, and multiple rate mechanisms can be assessed.

IX. CONCLUSION

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

THE ALLIANCE FOR SOLAR CHOICE
RIPUC DOCKET NO. 4568
REVIEW OF DISTRIBUTION RATE DESIGN
WITNESS: CAROLINE GOLIN

TASC EXHIBIT CG-1

CURRICULUM VITAE OF CAROLINE GOLIN

Caroline Golin
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SUMMARY

Present founder and CEO of The Greenlink Group Inc., an analysis and consulting firm built upon a suite of integrated, award-winning modeling tools, that provide the evidence and expert analysis needed to evaluate the most pressing issues of policy, energy, water, environmental economics, and climate change. Caroline is an energy and water policy expert and a PhD candidate in Energy Policy with a Masters in Environmental Engineering at the Georgia Institute of Technology. Caroline's research has informed energy policy adoption and business practices at the local, state, and national levels, with recommendations adopted by several companies, cities and states. She has published and authored several studies related to the field of energy policy, renewable energy, water policy, the water-energy nexus, and the environmental impacts of energy and water use.

Areas of Expertise include:

- Energy Policy: Net Metering, Feed-In-Tariffs, Value of Solar, and Community Solar, and Integration
- Water Resource Management
- Water-Energy Nexus
- Utility Integrated Resource Planning
- Environmental Impacts of Energy Generation: emissions, water use, and health impacts

EDUCATION

PhD Candidate. Energy Policy. *Georgia Institute of Technology*, 2015.

Masters in Civil and Environmental Engineering (MSCE). *Georgia Institute of Technology*, 2014.

Bachelors of Arts (BA). *University of Florida*, 2007.

PRESENT ACTIVITIES

The Greenlink Group. Founder/CEO, September 2014 – present

Principal Consultant and expert witness related to solar energy policy, water resource management, and methods for quantifying energy and water policy impacts with analytical experience in distributed energy and water policies.

Co-Creator of the ForeSEE Model, an integrated systems-environmental-economic modeling tool that can project hourly and daily social costs and benefits of energy and water policy shifts at the city, state, and utility scale.

Provide executive management for an analysis and consulting firm specializing in energy and water policy analysis at the city, utility, and state level.

Lead a team of engineers to develop a suite of novel, integrated models to strategically analyze the multiple systems, environmental, and economic components associated with shifts in energy and water use

Provide analysis and consult related to utility filings, commission proceedings, and integrated resource planning on issues of rate design, policy, and generation investments in Virginia, Tennessee, South Carolina, and Georgia.

Provide consult on advocacy related to 111(d) in southeastern states and the role of distributed solar in meeting federal compliance.

Develop methodologies and provide analysis related to valuing distributed solar resources as well as consult on methodology adoption in Tennessee and Georgia.

Provide expert testimony on the methods of valuing distributed resources, including the calculation of utility financials, rate impacts, avoided energy costs, avoided capacity costs, and the environmental externalities associated with traditional generation sources.

Consult with and train engineers, engineering managers and executives at various companies on potential behavioral, technological, and financial options for improved water and energy efficiency

Provide consult and analysis to cities on the most effective and economic measures for reducing energy and water use, including Atlanta, Orlando, and Kansas City.

Conduct innovative research related to the water-energy nexus, including the impacts of drought and water stress on energy generation, the benefits of distributed water resources in urban areas, and the impacts of water efficiency policies.

RELATED PAST EXPERIENCE

National Science Foundation IGERT Fellow. Georgia Institute of Technology**.** August 2011- Present

Propriety research conducted on energy and water management for Coca-Cola
Created models to assesse impacts of shifts in energy and water use for the integration of distributed resources.
Research on the adoption sustainable water resource management systems for the integration of water and energy infrastructure development on the ACF River Basin

Energy Analyst. Georgia Department of Agriculture. Atlanta, GA

Worked with the Georgia Department of Agriculture to assess the potential for bioenergy use and solar powered irrigation systems in Georgia.

RELEVANT ANALYSES. PRESENTATIONS, AND PUBLICATIONS *

**The majority of analyses and consulting work conducted at Georgia Tech and under The Greenlink Group is done under a non-disclosure agreement and therefore are not public.*

- Golin, C., Cox, M., Brown, M., & Thomas, V. 2015. The water efficiency gap. *Sustainable Water Resources Management*, 1-10.
- Golin, C. 2015. *The Future of Rate Design for Independent Operated Utilities.* Out for Review
- Matt Cox and Caroline Golin. 2015. *Analyzing Kansas City's Building Energy Benchmarking & Reporting Draft Proposed Ordinance*

- Matt Cox and Caroline Golin. 2015. *Analyzing Orlando's Building Energy Benchmarking & Reporting Draft Proposed Ordinance*
- Prepared Interrogatories with Southern Environmental Law Center on behalf of Appalachian Voices and the Chesapeake Climate Action Network (No PUE-2015-0006).
- Golin, Caroline and Matt Cox. 2015. *Determining the Value of Solar in Georgia*
- Golin, Caroline. 2015. *Water in the Wires: Understanding the Water-Energy Nexus in Urban Areas.* Out for Review
- Matt Cox and Caroline Golin. 2015. *Analyzing Kansas City's Building Energy Benchmarking & Reporting Draft Proposed Ordinance*
- UNC Nexus 2015: Water, Food, Climate and Energy Conference. Paper presenter: Water in the Wires.
- Prepared Direct Testimony of Caroline Golin on behalf of the Southern Alliance for Clean Energy (Docket 2014-246-E-December 10, 2014)
- Matt Cox and Caroline Golin. 2014. *The Impacts of Net Metering in South Carolina.* Presented as supporting evidence for Direct Testimony in Docket 2014-246-E-December 10, 2014
- Golin, Caroline (2014). Common Pollutants Impact Methodology. Original methodology submitted to the Tennessee Valley Authority Distributed Generation-Integrated Value Stakeholder Group.
- Golin, Caroline (2014). Water Use Impact Methodology. Original methodology submitted to the Tennessee Valley Authority Distributed Generation-Integrated Value Stakeholder Group.
- Golin, Caroline. The Greenlink Group (2014), Additional Explanation of Methodologies Underlying Additional Environmental Considerations Section, submitted by the Southern Environmental Law Center.
- C3E with MIT & Clean Energy Ministerial. 2014. Award Winner. The ForeSEE Model.
- Golin, Caroline, et al. 2013.*Toward a comprehensive framework for nanomaterials: An interdisciplinary assessment of the current Environmental Health and Safety Regulation regarding the handling of carbon nanotubes*. J. Chem. Health Safety
- Georgia Environmental Conference. 2012. Research presented on the Health Impacts of Coal-fired Electricity Production.
- Solar Power International Conference. 2012. Research presented on the Health Impacts of Coal-fired Electricity Production and Benefits of Distributed Solar.
- Golin, Caroline. 2012. *Towards the Full Cost of Coal: A review of the recent literature assessing the negative health care externalities associated with coal-fired electricity production.* Filed before the Georgia Public Services Commission- September 20, 2012.

THE ALLIANCE FOR SOLAR CHOICE
RIPUC DOCKET NO. 4568
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WITNESS: CAROLINE GOLIN

TASC EXHIBIT CG-2

NATIONAL GRID'S RESPONSE TO PUBLIC UTILITIES COMMISSION'S FIRST SET OF DATA REQUESTS (PUC 1-5)

PUC 1-5

Request:

Please identify the annual lost revenues from DG and net metering customers for the most recent 12-month period (please identify the date used).

Response:

The Company does not meter either the generation of the DG unit or the onsite consumption of net metered customers, and therefore, cannot provide an accurate calculation of annual lost revenue from net metering. The Company does report estimated annual generation associated with net metered customer’s generation in the annual Net Metering Report submitted each year in February as part of the Retail Rate filing. The information contained in the most recent annual Net Metering Report for calendar year 2014, which was provided as Schedule JAL-16 in Docket No. 4554, is also included in Attachment PUC 1-5. Assuming that the estimated annual generation of each unit can be used as a proxy for on-site consumption, the Company has calculated the estimated annual lost delivery service revenue in Attachment PUC 1-5. The calculation reflects an annual estimate for each DG customer, even if that DG customer became a net metered customer during 2014. The calculation is based on currently effective rates, and includes delivery service revenue (Transition, Distribution, Transmission, Energy Efficiency, and Renewable Energy Distribution), but does not include commodity revenue. The total estimated annual lost delivery service revenue is approximately $760,932.

Prepared by or under the supervision of: Peter T. Zschokke and Jeanne A. Lloyd

The Narragansett Electric Company
Net Metering Lost Delivery Revenue Estimation

Facility ID	Town	Capacity (kW)	Fuel Type	DG type	Date Authority to Interconnect Sent	Rate Class	Estimated Annual Generation - kWh	Estimated Annual Lost Revenue - Transition (Current Rates)	Estimated Annual Lost Revenue - Distribution (Current Rates)	Estimated Annual Lost Revenue - Transmission (Current Rates)	Estimated Annual Lost Revenue - Energy Efficiency (Current Rates)	Estimated Annual Lost Revenue - Renewable Energy Dist. (Current Rates)	Total Estimated Annual Lost Delivery Revenue
RI-000090	Pawtucket	0.5	Solar	Inverter	7/31/1998	A16	550	($1.11)	$22.36	$12.91	$5.41	$1.28	$40.85
RI-000083	East Greenwich	1	Solar	Inverter	9/3/1998	A16	1,100	($2.21)	$44.72	$25.83	$10.81	$2.55	$81.70
NECO-000026	Charlestown	2.1	Solar	Inverter	7/22/1999	A16	2,310	($4.64)	$93.90	$54.24	$22.71	$5.36	$171.56
RI-000116	Middletown	58	Solar	Inverter	9/9/1999	G32	63,800	($128.24)	$458.08	$593.34	$627.15	$148.02	$1,698.36
RI-000084	Foster	4	Solar	Inverter	12/31/1999	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000085	WARWICK	1.4	Solar	Inverter	6/15/2000	A16	1,540	($3.10)	$62.60	$36.16	$15.14	$3.57	$114.38
RI-000086	Cranston	0.3	Solar	Inverter	7/1/2000	A16	330	($0.66)	$13.41	$7.75	$3.24	$0.77	$24.51
RI-000088	Portsmouth	5	Solar	Inverter	10/1/2000	A16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
NECO-000035	Providence	1.14	Solar	Inverter	6/21/2001	A16	1,254	($2.52)	$50.98	$29.44	$12.33	$2.91	$93.13
NECO-000036	Middletown	1.8	Solar	Inverter	11/1/2001	A16	1,980	($3.98)	$80.49	$46.49	$19.46	$4.59	$147.05
NECO-000037	Burrillville	2	Solar	Inverter	1/1/2002	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
NECO-000034	West Kingston	5.76	Solar	Inverter	3/12/2002	G2	6,336	($12.74)	$43.53	$56.64	$62.28	$14.70	$164.42
NECO-000033	Providence	2	Solar	Inverter	5/1/2002	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
NECO-000031	Cranston	2	Solar	Inverter	8/15/2002	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
NECO-000032	North Kingstown	2	Solar	Inverter	8/15/2002	G2	2,200	($4.42)	$15.11	$19.67	$21.63	$5.10	$57.09
NECO-000030	West Kingston	2.5	Solar	Inverter	2/3/2003	A16	2,750	($5.53)	$111.79	$64.57	$27.03	$6.38	$204.24
NECO-000003	Charlestown	3.6	Solar	Inverter	8/1/2003	A16	3,960	($7.96)	$160.97	$92.98	$38.93	$9.19	$294.11
NECO-000002	Wakefield	10	Wind	(blank)	8/4/2003	A16	24,000	($48.24)	$975.60	$563.52	$235.92	$55.68	$1,782.48
NECO-000004	Cranston	3	Solar	Inverter	10/6/2003	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
NECO-000006	Westerly	3	Solar	Inverter	1/15/2004	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
NECO-000007	Bristol	8	Solar	Inverter	5/14/2004	G2	8,800	($17.69)	$60.46	$78.67	$86.50	$20.42	$228.36
NECO-000014	Cumberland	8.4	Solar	Inverter	9/10/2004	A16	9,240	($18.57)	$375.61	$216.96	$90.83	$21.44	$686.25
NECO-000024	Bristol	3.6	Solar	Inverter	9/17/2004	G32	3,960	($7.96)	$28.43	$36.83	$38.93	$9.19	$105.42
NECO-000025	Bristol	9	Solar	Inverter	9/17/2004	G32	9,900	($19.90)	$71.08	$92.07	$97.32	$22.97	$263.54
NECO-000001	Little Compton	10.53	Solar	Inverter	10/27/2004	A16	11,583	($23.28)	$470.85	$271.97	$113.86	$26.87	$860.27
NECO-000008	Westerly	5	Solar	Inverter	10/28/2004	A16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
NECO-000023	Narragansett	5.3	Solar	Inverter	11/9/2004	A16	5,830	($11.72)	$236.99	$136.89	$57.31	$13.53	$432.99
RI-000004	Charlestown	2.7	Solar	Inverter	1/7/2005	A16	2,970	($5.97)	$120.73	$69.74	$29.20	$6.89	$220.58
NECO-000009	West Greenwich	1.8	Solar	Inverter	3/9/2005	G2	1,980	($3.98)	$13.60	$17.70	$19.46	$4.59	$51.38
NECO-000018	SCITUATE	1.8	Solar	Inverter	5/5/2005	G32	1,980	($3.98)	$14.22	$18.41	$19.46	$4.59	$52.71
NECO-000010	Providence	20.04	Solar	Inverter	5/10/2005	G2	22,044	($44.31)	$151.44	$197.07	$216.69	$51.14	$572.04
RI-000001	Little Compton	10.03	Solar	Inverter	5/25/2005	A16	11,033	($22.18)	$448.49	$259.05	$108.45	$25.60	$819.42
NECO-000027	Providence	3.96	Solar	Inverter	5/27/2005	A16	4,356	($8.76)	$177.07	$102.28	$42.82	$10.11	$323.52
RI-000087	North Kingstown	3	Solar	Inverter	6/1/2005	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
NECO-000022	Wood River Jct	15	Solar	Inverter	6/2/2005	C06	16,500	($33.17)	$605.22	$341.88	$162.20	$38.28	$1,114.41
NECO-000011	WARWICK	8.95	Solar	Inverter	6/21/2005	A16	9,845	($19.79)	$400.20	$231.16	$96.78	$22.84	$731.19
NECO-000015	Barrington	4.488	Solar	Inverter	8/10/2005	A16	4,937	($9.92)	$200.68	$115.92	$48.53	$11.45	$366.66
NECO-000021	Barrington	2.9	Solar	Inverter	8/12/2005	A16	3,190	($6.41)	$129.67	$74.90	$31.36	$7.40	$236.92
NECO-000020	WARWICK	7.3	Solar	Inverter	8/12/2005	A16	8,030	($16.14)	$326.42	$188.54	$78.93	$18.63	$596.39
NECO-000016	Tiverton	5.1	Solar	Inverter	8/24/2005	A16	5,610	($11.28)	$228.05	$131.72	$55.15	$13.02	$416.65
NECO-000017	Lincoln	5.1	Solar	Inverter	8/24/2005	A16	5,610	($11.28)	$228.05	$131.72	$55.15	$13.02	$416.65
RI-000007	Providence	1	Solar	Inverter	10/25/2005	G62	1,100	($2.21)	$0.85	$13.72	$10.81	$2.55	$25.72
RI-000045	Narragansett	4	Solar	Inverter	10/27/2005	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000010	Tiverton	5	Solar	Inverter	10/27/2005	G02	5,500	($11.06)	$37.79	$49.17	$54.07	$12.76	$142.73
RI-000006	Cumberland	3.05	Solar	Inverter	12/12/2005	A16	3,355	($6.74)	$136.38	$78.78	$32.98	$7.78	$249.18
NECO-000028	Providence	24.9	Solar	Inverter	12/29/2005	G32	27,390	($55.05)	$196.66	$254.73	$269.24	$63.54	$729.12
RI-000069	West Kingston	5.55	Solar	Inverter	12/31/2005	A16	6,105	($12.27)	$248.17	$143.35	$60.01	$14.16	$453.42
RI-000044	Middletown	3	Solar	Inverter	1/1/2006	C06	3,300	($6.63)	$121.04	$68.38	$32.44	$7.66	$222.88
RI-000089	Charlestown	5.2	Solar	Inverter	1/1/2006	A16	5,720	($11.50)	$232.52	$134.31	$56.23	$13.27	$424.82
RI-000041	Providence	1.1	Solar	Inverter	1/26/2006	C06	1,210	($2.43)	$44.38	$25.07	$11.89	$2.81	$81.72
RI-000027	Providence	6	Solar	Inverter	1/27/2006	A16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
RI-000033	Ashaway	6.84	Solar	Inverter	1/27/2006	A16	7,524	($15.12)	$305.85	$176.66	$73.96	$17.46	$558.81
RI-000038	Providence	3.42	Solar	Inverter	2/7/2006	A16	3,762	($7.56)	$152.93	$88.33	$36.98	$8.73	$279.40
RI-000031	Providence	5.13	Solar	Inverter	2/20/2006	A16	5,643	($11.34)	$229.39	$132.50	$55.47	$13.09	$419.11
RI-000005	Narragansett	4	Solar	Inverter	3/2/2006	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
NECO-000013	Wakefield	5.32	Solar	Inverter	3/17/2006	A16	5,852	($11.76)	$237.88	$137.40	$57.53	$13.58	$434.63
RI-000012	Kingstown	5.86	Solar	Inverter	3/31/2006	C06	6,446	($12.96)	$236.44	$133.56	$63.36	$14.95	$435.36
NECO-000019	Portsmouth	660	Wind	Induction	4/1/2006	G32	1,584,000	($3,183.84)	$11,373.12	$14,731.20	$15,570.72	$3,674.88	$42,166.08
RI-000011	Charlestown	4	Solar	Inverter	4/7/2006	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000032	GLOUCESTER	4.56	Solar	Inverter	4/14/2006	A16	5,016	($10.08)	$203.90	$117.78	$49.31	$11.64	$372.54
RI-000008	Smithfield	10.54	Solar	Inverter	4/14/2006	A16	11,594	($23.30)	$471.30	$272.23	$113.97	$26.90	$861.09
RI-000014	Tiverton	4.008	Solar	Inverter	4/17/2006	A16	4,409	($8.86)	$179.22	$103.52	$43.34	$10.23	$327.44
RI-000026	West Kingston	4	Solar	Inverter	4/27/2006	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000030	Charlestown	4.18	Solar	Inverter	4/27/2006	A16	4,598	($9.24)	$186.91	$107.96	$45.20	$10.67	$341.49
NECO-000029	Cranston	50	Solar	Inverter	5/1/2006	C06	55,000	($110.55)	$2,017.40	$1,139.60	$540.65	$127.60	$3,714.70
RI-000039	Warren	4.56	Solar	Inverter	5/9/2006	A16	5,016	($10.08)	$203.90	$117.78	$49.31	$11.64	$372.54
RI-000016	Wakefield	5.7	Solar	Inverter	5/9/2006	A16	6,270	($12.60)	$254.88	$147.22	$61.63	$14.55	$465.67
RI-000022	Westerly	3.99	Solar	Inverter	5/18/2006	A16	4,389	($8.82)	$178.41	$103.05	$43.14	$10.18	$325.97
RI-000003	Peacedale	5.1	Solar	Inverter	6/2/2006	A16	5,610	($11.28)	$228.05	$131.72	$55.15	$13.02	$416.65
RI-000025	Portsmouth	3.4	Solar	Inverter	7/5/2006	A16	3,740	($7.52)	$152.03	$87.82	$36.76	$8.68	$277.77
RI-000019	Narragansett	3.3	Solar	Inverter	7/26/2006	A16	3,630	($7.30)	$147.56	$85.23	$35.68	$8.42	$269.60
RI-000021	South Kingstown	3.8	Solar	Inverter	7/26/2006	A16	4,180	($8.40)	$169.92	$98.15	$41.09	$9.70	$310.45
RI-000020	Charlestown	5.32	Solar	Inverter	7/26/2006	A16	5,852	($11.76)	$237.88	$137.40	$57.53	$13.58	$434.63
RI-000017	Wakefield	5.94	Solar	Inverter	7/26/2006	A16	6,534	($13.13)	$265.61	$153.42	$64.23	$15.16	$485.28
RI-000024	West Kingston	3.8	Solar	Inverter	8/17/2006	A16	4,180	($8.40)	$169.92	$98.15	$41.09	$9.70	$310.45
RI-000054	Portsmouth	1.8	Solar	Inverter	8/31/2006	G02	1,980	($3.98)	$13.60	$17.70	$19.46	$4.59	$51.38
RI-000040	Narragansett	5.7	Solar	Inverter	9/16/2006	A16	6,270	($12.60)	$254.88	$147.22	$61.63	$14.55	$465.67
RI-000028	Providence	3.06	Solar	Inverter	10/10/2006	A16	3,366	($6.77)	$136.83	$79.03	$33.09	$7.81	$249.99
RI-000002	Charlestown	5.25	Solar	Inverter	10/30/2006	A60	5,775	($11.61)	$156.96	$135.60	$56.77	$13.40	$351.12
RI-000013	Hope Valley	6.88	Solar	Inverter	10/30/2006	A16	7,568	($15.21)	$307.64	$177.70	$74.39	$17.56	$562.08
RI-000036	Jamestown	1.4	Solar	Inverter	11/2/2006	A16	1,540	($3.10)	$62.60	$36.16	$15.14	$3.57	$114.38
RI-000051	Bristol	4.2	Solar	Inverter	12/1/2006	A16	4,620	($9.29)	$187.80	$108.48	$45.41	$10.72	$343.13
RI-000035	South Kingstown	6.27	Solar	Inverter	12/11/2006	A16	6,897	($13.86)	$280.36	$161.94	$67.80	$16.00	$512.24
RI-000018	Barrington	3.25	Solar	Inverter	12/19/2006	A16	3,575	($7.19)	$145.32	$83.94	$35.14	$8.29	$265.52
RI-000009	Bristol	4	Solar	Inverter	12/19/2006	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000042a	Westerly	5.9	Solar	Inverter	1/11/2007	A16	6,490	($13.04)	$263.82	$152.39	$63.80	$15.06	$482.01
RI-000042b	Westerly	5.9	Solar	Inverter	1/11/2007	A16	6,490	($13.04)	$263.82	$152.39	$63.80	$15.06	$482.01
RI-000046	Westerly	6.4	Solar	Inverter	1/11/2007	A16	7,040	($14.15)	$286.18	$165.30	$69.20	$16.33	$522.86
RI-000023	Providence	1.7	Solar	Inverter	1/12/2007	A16	1,870	($3.76)	$76.02	$43.91	$18.38	$4.34	$138.88
RI-000049	Bristol	2	Solar	Inverter	1/31/2007	G02	2,200	($4.42)	$15.11	$19.67	$21.63	$5.10	$57.09
RI-000050	Middletown	2	Solar	Inverter	2/1/2007	G02	2,200	($4.42)	$15.11	$19.67	$21.63	$5.10	$57.09
RI-000043	Pawtucket	3.4	Solar	Inverter	2/2/2007	A16	3,740	($7.52)	$152.03	$87.82	$36.76	$8.68	$277.77
RI-000052	Wakefield	5.9	Solar	Inverter	2/6/2007	A16	6,490	($13.04)	$263.82	$152.39	$63.80	$15.06	$482.01
RI-000037	Cranston	5.7	Solar	Inverter	2/16/2007	A16	6,270	($12.60)	$254.88	$147.22	$61.63	$14.55	$465.67
RI-000053	SCITUATE	15.45	Solar	Inverter	6/11/2007	C06	16,995	($34.16)	$623.38	$352.14	$167.06	$39.43	$1,147.84
RI-000059	North Smithfield	2	Solar	Inverter	7/6/2007	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
RI-000060	Covertry	2	Solar	Inverter	7/6/2007	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
RI-000062	Hope Valley	3.12	Solar	Inverter	7/19/2007	C06	3,432	($6.90)	$125.89	$71.11	$33.74	$7.96	$231.80
RI-000073	Little Compton	3.04	Solar	Inverter	8/28/2007	A16	3,344	($6.72)	$135.93	$78.52	$32.87	$7.76	$248.36
RI-000071	Portsmouth	3.15	Solar	Inverter	9/25/2007	A16	3,465	($6.96)	$140.85	$81.36	$34.06	$8.04	$257.35
RI-000056	Greenville	19.4	Solar	Inverter	9/26/2007	G02	21,340	($42.89)	$146.61	$190.78	$209.77	$49.51	$553.77
RI-000061	Peace Dale	2	Solar	Inverter	9/27/2007	G32	2,200	($4.42)	$15.80	$20.46	$21.63	$5.10	$58.56
RI-000074	WARWICK	1.75	Solar	Inverter	10/1/2007	A16	1,925	($3.87)	$78.25	$45.20	$18.92	$4.47	$142.97
RI-000072	Middletown	2.45	Solar	Inverter	10/12/2007	A16	2,695	($5.42)	$109.55	$63.28	$26.49	$6.25	$200.16
RI-000077	Jamestown	3.675	Solar	Inverter	10/22/2007	A16	4,043	($8.13)	$164.33	$94.92	$39.74	$9.38	$300.24
RI-000080	Wakefield	2.4	Wind	Inverter	10/23/2007	A16	5,760	($11.58)	$234.14	$135.24	$56.62	$13.36	$427.80
RI-000078	SCITUATE	7.56	Solar	Inverter	10/29/2007	A16	8,316	($16.72)	$338.05	$195.26	$81.75	$19.29	$617.63
RI-000082	Little Compton	2.8	Solar	Inverter	11/7/2007	A16	3,080	($6.19)	$125.20	$72.32	$30.28	$7.15	$228.75

The Narragansett Electric Company
Net Metering Lost Delivery Revenue Estimation

Facility ID	Town	Capacity (kW)	Fuel Type	DG type	Date Authority to Interconnect Sent	Rate Class	Estimated Annual Generation - kWh	Estimated Annual Lost Revenue - Transition (Current Rates)	Estimated Annual Lost Revenue - Distribution (Current Rates)	Estimated Annual Lost Revenue - Transmission (Current Rates)	Estimated Annual Lost Revenue - Energy Efficiency (Current Rates)	Estimated Annual Lost Revenue - Renewable Energy Dist. (Current Rates)	Total Estimated Annual Lost Delivery Revenue
RI-000079	Newport	24.5	Solar	Inverter	11/16/2007	G02	26,950	($54.17)	$185.15	$240.93	$264.92	$62.52	$699.35
RI-000081	South Kingstown	4.2	Solar	Inverter	12/7/2007	A16	4,620	($9.29)	$187.80	$108.48	$45.41	$10.72	$343.13
RI-000058	West Greenwich	1.575	Solar	Inverter	12/13/2007	C06	1,733	($3.48)	$63.55	$35.90	$17.03	$4.02	$117.01
RI-000057	Jamestown	3.15	Solar	Inverter	12/31/2007	A16	3,465	($6.96)	$140.85	$81.36	$34.06	$8.04	$257.35
RI-000055	Wakefield	7	Solar	Inverter	12/31/2007	A16	7,700	($15.48)	$313.01	$180.80	$75.69	$17.86	$571.88
RI-000096	Narragansett	5.32	Solar	Inverter	6/9/2008	A16	5,852	($11.76)	$237.88	$137.40	$57.53	$13.58	$434.63
RI-000102	West Warwick	2	Solar	Inverter	6/13/2008	G02	2,200	($4.42)	$15.11	$19.67	$21.63	$5.10	$57.09
RI-000075	Little Compton	5.4	Solar	Inverter	6/18/2008	A16	5,940	($11.94)	$241.46	$139.47	$58.39	$13.78	$441.16
RI-000097	Jamestown	5.05	Solar	Inverter	6/25/2008	A16	5,555	($11.17)	$225.81	$130.43	$54.61	$12.89	$412.57
RI-000098	Portsmouth	5.6	Solar	Inverter	6/26/2008	A16	6,160	($12.38)	$250.40	$144.64	$60.55	$14.29	$457.50
RI-000100	Middletown	4.8	Wind	(blank)	7/3/2008	A16	11,520	($23.16)	$468.29	$270.49	$113.24	$26.73	$855.59
RI-000104	Westerly	7.2	Solar	Inverter	8/26/2008	A16	7,920	($15.92)	$321.95	$185.96	$77.85	$18.37	$588.22
RI-000103	Saunderstown	3	Solar	Inverter	9/17/2008	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000112	Portsmouth	3	Solar	Inverter	9/26/2008	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000110	Little Compton	4.2	Solar	Inverter	9/29/2008	A16	4,620	($9.29)	$187.80	$108.48	$45.41	$10.72	$343.13
RI-000107	Wakefield	3.24	Solar	Inverter	9/30/2008	A16	3,564	($7.16)	$144.88	$83.68	$35.03	$8.27	$264.70
RI-000111	Providence	3.28	Solar	Inverter	10/8/2008	C06	3,608	($7.25)	$132.34	$74.76	$35.47	$8.37	$243.68
RI-000113	Newport	3.07	Solar	Inverter	10/14/2008	A16	3,377	($6.79)	$137.28	$79.29	$33.20	$7.83	$250.81
RI-000109	Providence	2.87	Solar	Inverter	10/30/2008	A16	3,157	($6.35)	$128.33	$74.13	$31.03	$7.32	$234.47
RI-000120	Middletown	1.2	Wind	Inverter	11/20/2008	A16	2,880	($5.79)	$117.07	$67.62	$28.31	$6.68	$213.90
RI-000119	Middletown	1.98	Solar	Inverter	11/20/2008	A16	2,178	($4.38)	$88.54	$51.14	$21.41	$5.05	$161.76
RI-000117	Newport	2	Solar	Inverter	11/20/2008	A16	2,200	($4.42)	$89.43	$51.66	$21.63	$5.10	$163.39
RI-000121	Johnston	2.88	Solar	Inverter	12/8/2008	A16	3,168	($6.37)	$128.78	$74.38	$31.14	$7.35	$235.29
RI-000126	Cumberland	1.8	Solar	Inverter	1/14/2009	A16	1,980	($3.98)	$80.49	$46.49	$19.46	$4.59	$147.05
RI-000122	Tiverton	2	Solar	Inverter	1/14/2009	A16	2,200	($4.42)	$89.43	$51.66	$21.63	$5.10	$163.39
RI-000128	North Providence	3.15	Solar	Inverter	1/15/2009	A16	3,465	($6.96)	$140.85	$81.36	$34.06	$8.04	$257.35
RI-000124	W. Greenwich	5.04	Solar	Inverter	1/15/2009	A16	5,544	($11.14)	$225.36	$130.17	$54.50	$12.86	$411.75
RI-000123	Middletown	27.6	Solar	Inverter	2/17/2009	C06	30,360	($61.02)	$1,113.60	$629.06	$298.44	$70.44	$2,050.51
RI-000129	Hope (Fiskeville)	6	Solar	Inverter	2/26/2009	A16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
RI-000101	Portsmouth	1500	Wind	Induction	3/18/2009	G32	3,600,000	($7,236.00)	$25,848.00	$33,480.00	$35,388.00	$8,352.00	$95,832.00
RI-000135	Wyoming	7	Solar	Inverter	4/1/2009	A16	7,700	($15.48)	$313.01	$180.80	$75.69	$17.86	$571.88
RI-000133	Westerly	3.78	Solar	Inverter	4/7/2009	A16	4,158	($8.36)	$169.02	$97.63	$40.87	$9.65	$308.81
RI-000137	Johnston	5.46	Solar	Inverter	4/22/2009	A16	6,006	($12.07)	$244.14	$141.02	$59.04	$13.93	$446.07
RI-000108	WARWICK	23.625	Solar	Inverter	5/18/2009	G02	25,988	($52.23)	$178.53	$232.33	$255.46	$60.29	$674.38
RI-000136	Hopkinton	1.8	Solar	Inverter	6/19/2009	A16	1,980	($3.98)	$80.49	$46.49	$19.46	$4.59	$147.05
RI-000144	Foster	1.3	Wind	Inverter	7/6/2009	A16	3,120	($6.27)	$126.83	$73.26	$30.67	$7.24	$231.72
RI-000142	Charleston	4.2	Solar	Inverter	7/7/2009	A16	4,620	($9.29)	$187.80	$108.48	$45.41	$10.72	$343.13
RI-000132	WARWICK	100	Wind	Inverter	8/18/2009	G32	240,000	($482.40)	$1,723.20	$2,232.00	$2,359.20	$556.80	$6,388.80
RI-000147	Cranston	3.85	Solar	Inverter	8/20/2009	A16	4,235	($8.51)	$172.15	$99.44	$41.63	$9.83	$314.53
RI-000151	Jamestown	1.8	Solar	Inverter	11/18/2009	A16	1,980	($3.98)	$80.49	$46.49	$19.46	$4.59	$147.05
RI-000148	Prudence Island	2.1	Solar	Inverter	11/19/2009	A16	2,310	($4.64)	$93.90	$54.24	$22.71	$5.36	$171.56
RI-000157	Hope Valley	3.6	Solar	Inverter	12/4/2009	A16	3,960	($7.96)	$160.97	$92.98	$38.93	$9.19	$294.11
RI-000146	Middletown	100	Wind	Inverter	12/10/2009	G02	240,000	($482.40)	$1,648.80	$2,145.60	$2,359.20	$556.80	$6,228.00
RI-000160	Providence	50	Solar	Inverter	12/29/2009	G02	55,000	($110.55)	$377.85	$491.70	$540.65	$127.60	$1,427.25
RI-000154	Providence	75	Solar	Inverter	12/29/2009	G02	82,500	($165.83)	$566.78	$737.55	$810.98	$191.40	$2,140.88
RI-000159	Cumberland	5	Solar	Inverter	1/11/2010	A16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
RI-000163	Woonsocket	3	Solar	Inverter	1/12/2010	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000162	Jamestown	4.5	Solar	Inverter	1/15/2010	A16	4,950	($9.95)	$201.22	$116.23	$48.66	$11.48	$367.64
RI-000152	Tiverton	4.8	Solar	Inverter	2/22/2010	A16	5,280	($10.61)	$214.63	$123.97	$51.90	$12.25	$392.15
RI-000176	N Smithfield	1.5	Wind	Inverter	6/10/2010	A16	3,600	($7.24)	$146.34	$84.53	$35.39	$8.35	$267.37
RI-000177	Barrington	6	Solar	Inverter	6/22/2010	A16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
RI-000174	Rumford	3	Solar	Inverter	7/19/2010	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000183	Little Compton	3	Solar	Inverter	7/19/2010	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000184	Bristol	4	Solar	Inverter	7/23/2010	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000172	SCITUATE	4	Solar	Inverter	7/26/2010	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000175	Providence	1.5	Wind	Inverter	8/2/2010	C06	3,600	($7.24)	$132.05	$74.59	$35.39	$8.35	$243.14
RI-000156	South Kingston(Wakefield)	3.15	Solar	Inverter	8/17/2010	A16	3,465	($6.96)	$140.85	$81.36	$34.06	$8.04	$257.35
RI-000171	Narragansett	4	Solar	Inverter	10/5/2010	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000127	Narragansett	10	Wind	Inverter	10/8/2010	C06	24,000	($48.24)	$880.32	$497.28	$235.92	$55.68	$1,620.96
RI-000178	Little Compton	14	Solar	Inverter	10/19/2010	A16	15,400	($30.95)	$626.01	$361.59	$151.38	$35.73	$1,143.76
RI-000194	Exeter	3.61	Solar	Inverter	11/10/2010	A16	3,971	($7.98)	$161.42	$93.24	$39.03	$9.21	$294.93
RI-000190	Jamestown	4	Solar	Inverter	11/16/2010	C02	4,400	($8.84)	$161.39	$91.17	$43.25	$10.21	$297.18
RI-000170	Barrington	3	Solar	Inverter	11/19/2010	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000181	SCITUATE	3	Solar	Inverter	11/19/2010	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000209	North Kingstown	1.5	Wind	Inverter	1/7/2011	A16	3,600	($7.24)	$146.34	$84.53	$35.39	$8.35	$267.37
RI-000207	West Kingston	4	Solar	Inverter	1/13/2011	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000193	Narragansett	5	Solar	Inverter	1/18/2011	A16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
RI-000208	Charlestown	5	Solar	Inverter	2/1/2011	A16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
RI-000216	West Kingston	5.25	Solar	Inverter	3/2/2011	A16	5,775	($11.61)	$234.75	$135.60	$56.77	$13.40	$428.91
RI-000188	Pawtucket	164	Solar	Inverter	3/2/2011	G32	180,400	($362.60)	$1,295.27	$1,677.72	$1,773.33	$418.53	$4,802.25
RI-000192a	Johnston	19	Solar	Inverter	3/9/2011	G02	20,900	($42.01)	$143.58	$186.85	$205.45	$48.49	$542.36
RI-000212	South Kingston	2.6	Solar	Inverter	3/18/2011	A16	2,860	($5.75)	$116.26	$67.15	$28.11	$6.64	$212.41
RI-000201	Charlestown	30	Solar	Inverter	3/22/2011	G02	33,000	($66.33)	$226.71	$295.02	$324.39	$76.56	$856.35
RI-000200	North Kingston	2.9	Solar	Inverter	3/23/2011	A16	3,190	($6.41)	$129.67	$74.90	$31.36	$7.40	$236.92
RI-000191	Providence	50	Solar	Inverter	3/23/2011	C02	55,000	($110.55)	$2,017.40	$1,139.60	$540.65	$127.60	$3,714.70
RI-000192c	Providence	20.3	Solar	Inverter	3/30/2011	G02	22,330	($44.88)	$153.41	$199.63	$219.50	$51.81	$579.46
RI-000192b	Barrington	21	Solar	Inverter	4/5/2011	G02	23,100	($46.43)	$158.70	$206.51	$227.07	$53.59	$599.45
RI-000218	Compton	4.8	Solar	Inverter	4/8/2011	A16	5,280	($10.61)	$214.63	$123.97	$51.90	$12.25	$392.15
RI-000210	Newport	1.14	Solar	Inverter	7/13/2011	A16	1,254	($2.52)	$50.98	$29.44	$12.33	$2.91	$93.13
RI-000224	Cumberland	2.27	Solar	Inverter	8/2/2011	A16	2,497	($5.02)	$101.50	$58.63	$24.55	$5.79	$185.45
RI-000228	North Smithfield	13	Solar	Inverter	8/11/2011	G32	14,300	($28.74)	$581.30	$132.99	$140.57	$33.18	$859.29
RI-000229	Charlestown	3	Solar	Inverter	10/7/2011	A16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
RI-000235	Providence	4	Solar	Inverter	10/10/2011	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000227	Lincoln	60	Solar	Inverter	10/10/2011	G02	66,000	($132.66)	$453.42	$590.04	$648.78	$153.12	$1,712.70
RI-000230	Littlecompton	4	Solar	Inverter	10/17/2011	A16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
RI-000213	Narragansett	100	Wind	Inverter	10/19/2011	G02	240,000	($482.40)	$1,648.80	$2,145.60	$2,359.20	$556.80	$6,228.00
RI-000217	Providence	35	Solar	Inverter	11/10/2011	C06	38,500	($77.39)	$1,412.18	$1,040.27	$378.46	$89.32	$2,842.84
RI-000232	Providence	10	Solar	Inverter	11/18/2011	C06	11,000	($22.11)	$403.48	$227.92	$108.13	$25.52	$742.94
RI-000234	Hope Valley	6	Solar	Inverter	12/20/2011	A16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
13433708	L COMPTON	4	Solar	Inverter	1/20/2012	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
13163366	CRANSTON	3	Solar	Inverter	1/27/2012	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
13163630	KENYON	4	Solar	Inverter	1/27/2012	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
13287157	WEST WARWICK	150	Solar	Inverter	1/27/2012	G-2	165,000	($331.65)	$1,133.55	$1,475.10	$1,621.95	$382.80	$4,281.75
13168640	TIVERTON	5	Solar	Inverter	1/30/2012	A-16	5,500	($11.06)	$37.79	$129.14	$54.07	$12.76	$222.70
13337931	WEST WARWICK	225	Hydro	Synchronous	2/1/2012	B-32	450,000	($904.50)	$3,231.00	$5,611.50	$4,423.50	$1,044.00	$13,405.50
13286055	CUMBERLAND	260	Solar	Inverter	2/10/2012	G-32	286,000	($574.86)	$1,964.82	$2,659.80	$2,811.38	$663.52	$7,524.66
12240150	BRISTOL	4	Solar	Inverter	2/13/2012	A-16	4,400	($8.84)	$30.23	$103.31	$43.25	$10.21	$178.16
13163682	ESMOND	7	Solar	Inverter	2/13/2012	A-16	7,700	($15.48)	$52.90	$180.80	$75.69	$17.86	$311.77
13169212	PROVIDENCE	0.57	Solar	Inverter	2/13/2012	A-16	627	($1.26)	$4.31	$14.72	$6.16	$1.45	$25.39
12148883	NEWPORT	8	Solar	Inverter	2/28/2012	A-16	8,800	($17.69)	$60.46	$206.62	$86.50	$20.42	$356.31
13168408	RUMFORD	4	Solar	Inverter	2/29/2012	A-16	4,400	($8.84)	$30.23	$103.31	$43.25	$10.21	$178.16
12442025	BRISTOL	5	Solar	Inverter	3/9/2012	A-16	5,500	($11.06)	$37.79	$129.14	$54.07	$12.76	$222.70
13168551	LINCOLN	5	Solar	Inverter	3/9/2012	A-16	5,500	($11.06)	$37.79	$129.14	$54.07	$12.76	$222.70
13551480	LINCOLN	6	Solar	Inverter	3/12/2012	G-2	6,600	($13.27)	$45.34	$59.00	$64.88	$15.31	$171.27
13170555	PEACE DALE	7.2	Solar	Inverter	3/14/2012	A-16	7,920	($15.92)	$321.95	$185.96	$77.85	$18.37	$588.22
12381648	L COMPTON	7.5	Solar	Inverter	3/16/2012	C-06	8,250	($16.58)	$302.61	$170.94	$81.10	$19.14	$557.21
13168708	PRUDENCE ISL	3	Solar	Inverter	3/16/2012	C-02	3,300	($6.63)	$121.04	$68.38	$32.44	$7.66	$222.88
13169065	NARRAGANSETT	10	Solar	Inverter	3/30/2012	G-2	11,000	($22.11)	$75.57	$98.34	$108.13	$25.52	$285.45

The Narragansett Electric Company
Net Metering Lost Delivery Revenue Estimation

Facility ID	Town	Capacity (kW)	Fuel Type	DG type	Date Authority to Interconnect Sent	Rate Class	Estimated Annual Generation - kWh	Estimated Annual Lost Revenue - Transition (Current Rates)	Estimated Annual Lost Revenue - Distribution (Current Rates)	Estimated Annual Lost Revenue - Transmission (Current Rates)	Estimated Annual Lost Revenue - Energy Efficiency (Current Rates)	Estimated Annual Lost Revenue - Renewable Energy Dist. (Current Rates)	Total Estimated Annual Lost Delivery Revenue
13168803	NORTH KINGSTOWN	20	Solar	Inverter	4/2/2012	G-2	22,000	($44.22)	$151.14	$196.68	$216.26	$51.04	$570.90
12729266	WOOD RIVER JT	6	solar	Inverter	5/1/2012	A-16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
12808914	PAWTUCKET	23	Solar	Inverter	5/10/2012	G-2	25,300	($50.85)	$173.81	$226.18	$248.70	$58.70	$656.54
13433977	BRISTOL	50	Wind	(blank)	5/14/2012	C-02	120,000	($241.20)	$4,401.60	$2,486.40	$1,179.60	$278.40	$8,104.80
13177748	JOHNSTON	6	Solar	Inverter	5/22/2012	C-06	6,600	($13.27)	$242.09	$136.75	$64.88	$15.31	$445.76
12778215	PROVIDENCE	4.73	solar	Inverter	5/30/2012	a-16	5,203	($10.46)	$211.50	$122.17	$51.15	$12.07	$386.43
12723949	PROVIDENCE	3	solar	Inverter	5/31/2012	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
12726566	PROVIDENCE	5.3	solar	Inverter	5/31/2012	A-16	5,830	($11.72)	$236.99	$136.89	$57.31	$13.53	$432.99
12797813	PROVIDENCE	4.73	solar	Inverter	5/31/2012	c-06	5,203	($10.46)	$190.85	$107.81	$51.15	$12.07	$351.41
13168581	JAMESTOWN	4	Solar	Inverter	6/25/2012	C-06	4,400	($8.84)	$161.39	$91.17	$43.25	$10.21	$297.18
13168917	WESTERLY	10	Solar	Inverter	6/25/2012	C-02	11,000	($22.11)	$403.48	$227.92	$108.13	$25.52	$742.94
12790101	PROVIDENCE	5.16	solar	Inverter	7/2/2012	a-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
12981846	PROVIDENCE	3.44	Solar	Inverter	7/2/2012	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
12930973	NORTH KINGSTOWN	2	solar	Inverter	7/16/2012	A-16	2,200	($4.42)	$89.43	$51.66	$21.63	$5.10	$163.39
12741538	PROVIDENCE	3.2	solar	Inverter	7/18/2012	a-16	3,520	($7.08)	$143.09	$82.65	$34.60	$8.17	$261.43
12700487	PROVIDENCE	1.29	solar	Inverter	7/19/2012	C-06	1,419	($2.85)	$52.05	$29.40	$13.95	$3.29	$95.84
13262387	NARRAGANSETT	3.66	Solar	Inverter	7/20/2012	A-16	4,026	($8.09)	$163.66	$94.53	$39.58	$9.34	$299.01
13086985	PROVIDENCE	4.73	Solar	Inverter	7/30/2012	C-06	5,203	($10.46)	$190.85	$107.81	$51.15	$12.07	$351.41
12733869	PROVIDENCE	4.73	solar	Inverter	8/3/2012	A-60	5,203	($10.46)	$141.42	$122.17	$51.15	$12.07	$316.34
13063715	PROVIDENCE	3.87	Solar	Inverter	8/3/2012	C-06	4,257	($8.56)	$156.15	$88.21	$41.85	$9.88	$287.52
12815821	PROVIDENCE	3.23	Solar	Inverter	8/8/2012	A-16	3,553	($7.14)	$144.43	$83.42	$34.93	$8.24	$263.88
13263785	PROVIDENCE	2.37	Solar	Inverter	8/15/2012	A-16	2,607	($5.24)	$105.97	$61.21	$25.63	$6.05	$193.62
12700157	PROVIDENCE	6.45	solar	Inverter	8/29/2012	C-06	7,095	($14.26)	$260.24	$147.01	$69.74	$16.46	$479.20
13356318	SAUNDERSTOWN	2.37	Solar	Inverter	9/4/2012	A-16	2,607	($5.24)	$105.97	$61.21	$25.63	$6.05	$193.62
13432975	PROVIDENCE	4.3	Solar	Inverter	9/5/2012	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
13407239	PROVIDENCE	3.87	Solar	Inverter	9/7/2012	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
12613705	PROVIDENCE	50	solar	Inverter	9/18/2012	G-62	55,000	($110.55)	$42.35	$685.85	$540.65	$127.60	$1,285.90
13256165	WAKEFIELD	4.95	Solar	Inverter	9/28/2012	A-16	5,445	($10.94)	$221.34	$127.85	$53.52	$12.63	$404.40
13609645	L COMPTON	1.72	Solar	Inverter	9/28/2012	A-16	1,892	($3.80)	$76.91	$44.42	$18.60	$4.39	$140.52
13227471	PROVIDENCE	2	Solar	Inverter	10/5/2012	C-06	2,200	($4.42)	$80.70	$45.58	$21.63	$5.10	$148.59
13188008	CRANSTON	21	Solar	Inverter	10/10/2012	A-16	23,100	($46.43)	$939.02	$542.39	$227.07	$53.59	$1,715.64
13755485	CHARLESTOWN	7	Solar	Inverter	11/16/2012	A-16	7,700	($15.48)	$313.01	$180.80	$75.69	$17.86	$571.88
13679422	JAMESTOWN	1.29	Solar	Inverter	11/20/2012	A-16	1,419	($2.85)	$57.68	$33.32	$13.95	$3.29	$105.39
13868654	BARRINGTON	3.87	Solar	Inverter	11/26/2012	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
13301833	NORTH SMITHFIELD	5.3	Solar	Inverter	11/30/2012	A-16	5,830	($11.72)	$236.99	$136.89	$57.31	$13.53	$432.99
13854152	WESTERLY	5	Solar	Inverter	12/5/2012	A-17	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
12762756	CRANSTON	3.65	Solar	Inverter	12/20/2012	A-18	4,015	($8.07)	$163.21	$94.27	$39.47	$9.31	$298.19
12282568	BRADFORD	10.3	Solar	Inverter	12/21/2012	G-32	11,330	($22.77)	$81.35	$105.37	$111.37	$26.29	$301.60
13605369	CUMBERLAND	0.43	Solar	Inverter	2/6/2013	C-06	473	($0.95)	$17.35	$9.80	$4.65	$1.10	$31.95
13605566	PROVIDENCE	0.43	Solar	Inverter	2/6/2013	C-06	473	($0.95)	$17.35	$9.80	$4.65	$1.10	$31.95
13911749	PROVIDENCE	1.44	Solar	Inverter	2/6/2013	A-16	1,584	($3.18)	$64.39	$37.19	$15.57	$3.67	$117.64
13933429	JAMESTOWN	4	Solar	Inverter	2/22/2013	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
14588725	EAST GREENWICH	1.51	Solar	Inverter	3/26/2013	A-16	1,661	($3.34)	$67.52	$39.00	$16.33	$3.85	$123.36
14469194	SAUNDERSTOWN	3.01	Solar	Inverter	3/27/2013	A-15	3,311	($6.66)	$134.59	$77.74	$32.55	$7.68	$245.91
14726048	EAST GREENWICH	4	Solar	Inverter	5/3/2013	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
14276764	NARRAGANSETT	2.8	Solar	Inverter	6/14/2013	A-16	3,080	($6.19)	$125.20	$72.32	$30.28	$7.15	$228.75
14847417	NARRAGANSETT	4	Solar	Inverter	6/14/2013	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
14278306	PROVIDENCE	0.86	Solar	Inverter	6/26/2013	A-16	946	($1.90)	$38.45	$22.21	$9.30	$2.19	$70.26
14276819	L COMPTON	3.01	Solar	Inverter	7/10/2013	A-16	3,311	($6.66)	$134.59	$77.74	$32.55	$7.68	$245.91
14726475	NEWPORT	2.15	Solar	Inverter	7/10/2013	A-16	2,365	($4.75)	$96.14	$55.53	$23.25	$5.49	$175.65
14601977	CRANSTON	4.95	Solar	Inverter	7/17/2013	A-16	5,445	($10.94)	$221.34	$127.85	$53.52	$12.63	$404.40
14601995	NORTH SCITUATE	5.16	Solar	Inverter	7/19/2013	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
14589949	BRISTOL	28	Solar	Inverter	7/31/2013	g-02	30,800	($61.91)	$211.60	$275.35	$302.76	$71.46	$799.26
14790269	NORTH KINGSTOWN	23	Solar	Inverter	8/2/2013	g-02	25,300	($50.85)	$173.81	$226.18	$248.70	$58.70	$656.54
14601876	FOSTER	2.15	Solar	Inverter	8/8/2013	A-16	2,365	($4.75)	$96.14	$55.53	$23.25	$5.49	$175.65
14276693	MIDDLETOWN	0.86	Solar	Inverter	8/9/2013	A-16	946	($1.90)	$38.45	$22.21	$9.30	$2.19	$70.26
14780864	NEWPORT	2	Solar	Inverter	8/9/2013	A-16	2,200	($4.42)	$89.43	$51.66	$21.63	$5.10	$163.39
14761875	MIDDLETOWN	3.66	Solar	Inverter	8/9/2013	A-16	4,026	($8.09)	$163.66	$94.53	$39.58	$9.34	$299.01
14855860	PAWTUCKET	14	Solar	Inverter	8/9/2013	G-32	15,400	($30.95)	$7.85	$143.22	$151.38	$35.73	$307.23
13220170	PROVIDENCE	300	Solar	Inverter	8/14/2013	G-32	330,000	($663.30)	$2,369.40	$3,069.00	$3,243.90	$765.60	$8,784.60
13425175	MIDDLETOWN	20	Solar	Inverter	8/16/2013	a-16	22,000	($44.22)	$894.30	$516.56	$216.26	$51.04	$1,633.94
14767040	PROVIDENCE	4	Solar	Inverter	8/16/2013	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
15481450	JOHNSTON	10	Solar	Inverter	8/20/2013	c-06	11,000	($22.11)	$403.48	$227.92	$108.13	$25.52	$742.94
14735613	PROVIDENCE	5	Solar	Inverter	8/22/2013	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
15476331	PORTSMOUTH	2.5	Solar	Inverter	8/22/2013	A-16	2,750	($5.53)	$111.79	$64.57	$27.03	$6.38	$204.24
15212872	JAMESTOWN	4.3	Solar	Inverter	8/27/2013	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
15280721	CHEPACHET	6.02	Solar	Inverter	9/4/2013	a-16	6,622	($13.31)	$269.18	$155.48	$65.09	$15.36	$491.82
15378490	NEWPORT	2.15	Solar	Inverter	9/4/2013	A-16	2,365	($4.75)	$96.14	$55.53	$23.25	$5.49	$175.65
15358807	CHARLESTOWN	5.16	Solar	Inverter	9/4/2013	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
14726436	PEACE DALE	2.8	Solar	Inverter	9/6/2013	A-16	3,080	($6.19)	$125.20	$72.32	$30.28	$7.15	$228.75
14753836	EXETER	5.16	Solar	Inverter	9/19/2013	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
15187880	SAUNDERSTOWN	5.16	Solar	Inverter	9/19/2013	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
15289861	TIVERTON	4.3	Solar	Inverter	9/19/2013	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
14874919	JAMESTOWN	3.01	Solar	Inverter	9/26/2013	A-16	3,311	($6.66)	$134.59	$77.74	$32.55	$7.68	$245.91
15075211	CRANSTON	5.16	Solar	Inverter	10/3/2013	A-16 .	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
15128281	WESTERLY	7.96	Solar	Inverter	10/3/2013	a-16	8,756	($17.60)	$355.93	$205.59	$86.07	$20.31	$650.31
15211271	NORTH SCITUATE	5.1	Solar	Inverter	10/3/2013	A-16	5,610	($11.28)	$228.05	$131.72	$55.15	$13.02	$416.65
15660811	SAUNDERSTOWN	2.58	Solar	Inverter	10/3/2013	A-16	2,838	($5.70)	$115.36	$66.64	$27.90	$6.58	$210.78
15140057	WARREN	3.66	Solar	Inverter	10/16/2013	a-16	4,026	($8.09)	$163.66	$94.53	$39.58	$9.34	$299.01
15441523	CHARLESTOWN	6.45	Solar	Inverter	10/16/2013	a-16	7,095	($14.26)	$288.41	$166.59	$69.74	$16.46	$526.95
15551310	JOHNSTON	4.09	Solar	Inverter	10/16/2013	A-16	4,499	($9.04)	$182.88	$105.64	$44.23	$10.44	$334.14
15135359	TIVERTON	7.74	Solar	Inverter	10/17/2013	a-16	8,514	($17.11)	$346.09	$199.91	$83.69	$19.75	$632.33
15150360	PORTSMOUTH	2.15	Solar	Inverter	10/18/2013	A-16	2,365	($4.75)	$96.14	$55.53	$23.25	$5.49	$175.65
14800225	CRANSTON	12.96	Solar	Inverter	10/21/2013	a-16	14,256	($28.65)	$579.51	$334.73	$140.14	$33.07	$1,058.79
15886590	JAMESTOWN	1.29	Solar	Inverter	10/23/2013	A-16	1,419	($2.85)	$57.68	$33.32	$13.95	$3.29	$105.39
15877444	PORTSMOUTH	3.66	Solar	Inverter	10/23/2013	A-16	4,026	($8.09)	$163.66	$94.53	$39.58	$9.34	$299.01
15960523	HOPE	3.87	Solar	Inverter	10/29/2013	C-06	4,257	($8.56)	$156.15	$88.21	$41.85	$9.88	$287.52
15613973	WARWICK	3.6	Solar	Inverter	11/6/2013	A-16	3,960	($7.96)	$160.97	$92.98	$38.93	$9.19	$294.11
15912539	SAUNDERSTOWN	5.81	Solar	Inverter	11/15/2013	A-16	6,391	($12.85)	$259.79	$150.06	$62.82	$14.83	$474.66
16020398	PAWTUCKET	5.16	Solar	Inverter	11/18/2013	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
14913107	MIDDLETOWN	2.8	Solar	Inverter	11/26/2013	A-16	3,080	($6.19)	$125.20	$72.32	$30.28	$7.15	$228.75
15600663	PROVIDENCE	3.01	Solar	Inverter	11/26/2013	A-16	3,311	($6.66)	$134.59	$77.74	$32.55	$7.68	$245.91
15950635	NEWPORT	5.16	Solar	Inverter	11/26/2013	C-06	5,676	($11.41)	$208.20	$117.61	$55.80	$13.17	$383.36
15960570	WARWICK	3.23	Solar	Inverter	11/26/2013	A-16	3,553	($7.14)	$144.43	$83.42	$34.93	$8.24	$263.88
16032506	TIVERTON	7.96	Solar	Inverter	11/26/2013	A-16	8,756	($17.60)	$355.93	$205.59	$86.07	$20.31	$650.31
14761967	NORTH SMITHFIELD	7.74	Solar	Inverter	12/18/2013	A-16	8,514	($17.11)	$346.09	$199.91	$83.69	$19.75	$632.33
15960546	EAST GREENWICH	5.81	Solar	Inverter	12/19/2013	A-16	6,391	($12.85)	$259.79	$150.06	$62.82	$14.83	$474.66
16004074	EXETER	7.96	Solar	Inverter	12/19/2013	A-16	8,756	($17.60)	$355.93	$205.59	$86.07	$20.31	$650.31
16020662	MIDDLETOWN	4.3	Solar	Inverter	12/19/2013	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
13105351	RUMFORD	45.6	Solar	Inverter	12/20/2013	c-06	50,160	($100.82)	$1,839.87	$1,039.32	$493.07	$116.37	$3,387.81
13252180	PAWTUCKET	1.64	solar	Inverter	8/9/2009	A-16	1,804	($3.63)	$73.33	$42.36	$17.73	$4.19	$133.98
12440329	WARWICK	19.5	solar	Inverter	6/13/2011	C-06	21,450	($43.11)	$786.79	$444.44	$210.85	$49.76	$1,448.73
RI-000199	North Kingstown	405	Solar	Inverter	9/9/2011	B-62	445,500	($895.46)	$343.04	$5,555.39	$4,379.27	$1,033.56	$10,415.79
13339553	PORTSMOUTH	225	Wind	Inverter	3/20/2012	G-2	540,000	($1,085.40)	$3,709.80	$4,827.60	$5,308.20	$1,252.80	$14,013.00
13511760	TIVERTON	275	Wind	Inverter	6/5/2012	C-06	660,000	($1,326.60)	$24,208.80	$13,675.20	$6,487.80	$1,531.20	$44,576.40
12364353	EXETER	15.3	solar	Inverter	6/19/2012	C-06	16,830	($33.83)	$617.32	$348.72	$165.44	$39.05	$1,136.70
13115934	PROVIDENCE	4500	Wind	Inverter	10/16/2012	G-32	10,800,000	($21,708.00)	$77,544.00	$100,440.00	$106,164.00	$25,056.00	$287,496.00
12252717	NARRAGANSETT	10	Wind	Inverter	12/4/2012	G-2	24,000	($48.24)	$164.88	$214.56	$235.92	$55.68	$622.80

The Narragansett Electric Company
Net Metering Lost Delivery Revenue Estimation

Facility ID	Town	Capacity (kW)	Fuel Type	DG type	Date Authority to Interconnect Sent	Rate Class	Estimated Annual Generation - kWh	Estimated Annual Lost Revenue - Transition (Current Rates)	Estimated Annual Lost Revenue - Distribution (Current Rates)	Estimated Annual Lost Revenue - Transmission (Current Rates)	Estimated Annual Lost Revenue - Energy Efficiency (Current Rates)	Estimated Annual Lost Revenue - Renewable Energy Dist. (Current Rates)	Total Estimated Annual Lost Delivery Revenue
15779010	NORTH SCITUATE	10.75	Solar	Inverter	1/10/2014	A-16	11,825	($23.77)	$480.69	$277.65	$116.24	$27.43	$878.24
15660814	JAMESTOWN	7.65	Solar	Inverter	1/14/2014	A-16	8,415	($16.91)	$342.07	$197.58	$82.72	$19.52	$624.98
16119917	JAMESTOWN	5	Solar	Inverter	1/14/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
16281029	BARRINGTON	3.44	Solar	Inverter	1/14/2014	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
15680716	JAMESTOWN	6.45	Solar	Inverter	1/17/2014	A-16	7,095	($14.26)	$288.41	$166.59	$69.74	$16.46	$526.95
15987219	PROVIDENCE	3.44	Solar	Inverter	1/28/2014	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
15551662	PROVIDENCE	3.44	Solar	Inverter	1/28/2014	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
15650232	PROVIDENCE	3.87	Solar	Inverter	1/28/2014	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
16049358	PROVIDENCE	4.3	Solar	Inverter	1/28/2014	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
16052781	PROVIDENCE	3.01	Solar	Inverter	1/28/2014	A-16	3,311	($6.66)	$134.59	$77.74	$32.55	$7.68	$245.91
16240969	PROVIDENCE	3.87	Solar	Inverter	1/28/2014	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
14797804	FOSTER	8	Solar	Inverter	1/29/2014	A-16	8,800	($17.69)	$357.72	$206.62	$86.50	$20.42	$653.58
16020824	WARREN	1.29	Solar	Inverter	2/3/2014	A-16	1,419	($2.85)	$57.68	$33.32	$13.95	$3.29	$105.39
15862797	L COMPTON	4	Solar	Inverter	2/11/2014	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
16315480	WAKEFIELD	6	Solar	Inverter	2/11/2014	A-16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
15700681	JAMESTOWN	2.58	Solar	Inverter	3/5/2014	A-16	2,838	($5.70)	$115.36	$66.64	$27.90	$6.58	$210.78
16538805	WESTERLY	5	Solar	Inverter	4/11/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
16714328	CHEPACHET	2.58	Solar	Inverter	4/17/2014	A-16	2,838	($5.70)	$115.36	$66.64	$27.90	$6.58	$210.78
16863933	WEST WARWICK	0.43	Solar	Inverter	5/1/2014	A-16	473	($0.95)	$19.23	$11.11	$4.65	$1.10	$35.13
14882524	JAMESTOWN	3.44	Solar	Inverter	5/8/2014	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
16659042	JAMESTOWN	5	Solar	Inverter	5/14/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
15672019	PAWTUCKET	24	Solar	Inverter	5/22/2014	g-02	26,400	($53.06)	$181.37	$236.02	$259.51	$61.25	$685.08
13177831	WARREN	0.57	Solar	Inverter	5/23/2014	A-16	627	($1.26)	$25.49	$14.72	$6.16	$1.45	$46.57
16849037	WAKEFIELD	7.75	Solar	Inverter	6/2/2014	A-16	8,525	($17.14)	$346.54	$200.17	$83.80	$19.78	$633.15
15672618	PAWTUCKET	24	Solar	Inverter	6/5/2014	g-62	26,400	($53.06)	$20.33	$329.21	$259.51	$61.25	$617.23
17071966	TIVERTON	6	Solar	Inverter	6/16/2014	A-16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
16658943	JOHNSTON	7.5	Solar	Inverter	6/17/2014	A-16	8,250	($16.58)	$335.36	$193.71	$81.10	$19.14	$612.73
16714678	L COMPTON	11	Solar	Inverter	6/17/2014	a-16	12,100	($24.32)	$491.87	$284.11	$118.94	$28.07	$898.67
16811848	EAST GREENWICH	7.5	Solar	Inverter	6/28/2014	A-16	8,250	($16.58)	$335.36	$193.71	$81.10	$19.14	$612.73
16837237	WARWICK	5.16	Solar	Inverter	7/1/2014	A-16	5,676	($11.41)	$230.73	$133.27	$55.80	$13.17	$421.56
16922760	WESTERLY	6.45	Solar	Inverter	7/1/2014	A-16	7,095	($14.26)	$288.41	$166.59	$69.74	$16.46	$526.95
16789421	PORTSMOUTH	5	Solar	Inverter	7/2/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
16923859	EXETER	14.19	Solar	Inverter	7/7/2014	a-16	15,609	($31.37)	$634.51	$366.50	$153.44	$36.21	$1,159.28
17192714	CHARLESTOWN	3.22	Solar	Inverter	7/14/2014	A-16	3,542	($7.12)	$143.98	$83.17	$34.82	$8.22	$263.06
15430757	WAKEFIELD	3	Solar	Inverter	7/16/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
16796924	PORTSMOUTH	4	Solar	Inverter	7/23/2014	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
16841395	WESTERLY	6.25	Solar	Inverter	7/23/2014	A-16	6,875	($13.82)	$279.47	$161.43	$67.58	$15.95	$510.61
17099078	PAWTUCKET	3	Solar	Inverter	8/4/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
16617414	MIDDLETOWN	60	Solar	Inverter	8/18/2014	c-06	66,000	($132.66)	$2,420.88	$1,367.52	$648.78	$153.12	$4,457.64
16837718	PROVIDENCE	3.87	Solar	Inverter	8/21/2014	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
16841481	RUMFORD	5.25	Solar	Inverter	8/21/2014	A-16	5,775	($11.61)	$234.75	$135.60	$56.77	$13.40	$428.91
16922768	PAWTUCKET	2.5	Solar	Inverter	8/21/2014	A-16	2,750	($5.53)	$111.79	$64.57	$27.03	$6.38	$204.24
16847839	PROVIDENCE	2.75	Solar	Inverter	8/27/2014	A-16	3,025	($6.08)	$122.97	$71.03	$29.74	$7.02	$224.67
17470091	PROVIDENCE	3.75	Solar	Inverter	8/27/2014	A-16	4,125	($8.29)	$167.68	$96.86	$40.55	$9.57	$306.36
17584869	WEST KINGSTON	4	Solar	Inverter	8/27/2014	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
16611202	EAST PROVIDENCE	75	Solar	Inverter	9/3/2014	C-06	82,500	($165.83)	$3,026.10	$1,709.40	$810.98	$191.40	$5,572.05
16979864	WAKEFIELD	7.09	Solar	Inverter	9/5/2014	A-16	7,799	($15.68)	$317.03	$183.12	$76.66	$18.09	$579.23
16999144	PROVIDENCE	3.5	Solar	Inverter	9/5/2014	A-16	3,850	($7.74)	$156.50	$90.40	$37.85	$8.93	$285.94
17490946	BARRINGTON	3.25	Solar	Inverter	9/5/2014	A-16	3,575	($7.19)	$145.32	$83.94	$35.14	$8.29	$265.52
17584887	WEST KINGSTON	9	Solar	Inverter	9/5/2014	A-16	9,900	($19.90)	$402.44	$232.45	$97.32	$22.97	$735.27
16631931	WARWICK	30	Solar	Inverter	9/9/2014	g-02	33,000	($66.33)	$226.71	$295.02	$324.39	$76.56	$856.35
17447224	LINCOLN	3.44	Solar	Inverter	9/26/2014	A-16	3,784	($7.61)	$153.82	$88.85	$37.20	$8.78	$281.04
17769192	PROVIDENCE	2.5	Solar	Inverter	9/26/2014	A-16	2,750	($5.53)	$111.79	$64.57	$27.03	$6.38	$204.24
17449362	HOPE	7.6	Solar	Inverter	9/29/2014	A-16	8,360	($16.80)	$339.83	$196.29	$82.18	$19.40	$620.90
16788456	PROVIDENCE	5.5	Solar	Inverter	9/30/2014	A-16	6,050	($12.16)	$245.93	$142.05	$59.47	$14.04	$449.33
17665432	NORTH KINGSTOWN	2.5	Solar	Inverter	10/1/2014	A-16	2,750	($5.53)	$111.79	$64.57	$27.03	$6.38	$204.24
17665342	MIDDLETOWN	4	Solar	Inverter	10/2/2014	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
17665302	CRANSTON	3	Solar	Inverter	10/7/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
17732018	NEWPORT	3	Solar	Inverter	10/7/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
17723937	PORTSMOUTH	7.6	Solar	Inverter	10/10/2014	A-16	8,360	($16.80)	$339.83	$196.29	$82.18	$19.40	$620.90
17471891	GREENVILLE	3.87	Solar	Inverter	10/14/2014	A-16	4,257	($8.56)	$173.05	$99.95	$41.85	$9.88	$316.17
17711343	NARRAGANSETT	5	Solar	Inverter	10/17/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
17457905	JAMESTOWN	7	Solar	Inverter	10/23/2014	A-16	7,700	($15.48)	$313.01	$180.80	$75.69	$17.86	$571.88
17891429	EXETER	2	Solar	Inverter	10/23/2014	A-16	2,200	($4.42)	$89.43	$51.66	$21.63	$5.10	$163.39
17472411	L COMPTON	7.5	Solar	Inverter	10/28/2014	A-16	8,250	($16.58)	$335.36	$193.71	$81.10	$19.14	$612.73
15862938	JAMESTOWN	8.16	Solar	Inverter	10/29/2014	A-16	8,976	($18.04)	$364.87	$210.76	$88.23	$20.82	$666.65
17413565	RIVERSIDE	3.5	Solar	Inverter	10/29/2014	A-16	3,850	($7.74)	$156.50	$90.40	$37.85	$8.93	$285.94
17732094	JAMESTOWN	2.75	Solar	Inverter	10/29/2014	A-16	3,025	($6.08)	$122.97	$71.03	$29.74	$7.02	$224.67
17678400	JAMESTOWN	11	Solar	Inverter	10/30/2014	a-16	12,100	($24.32)	$491.87	$284.11	$118.94	$28.07	$898.67
17743200	NARRAGANSETT	3	Solar	Inverter	10/30/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
17473331	FOSTER	4.5	Solar	Inverter	11/4/2014	A-16	4,950	($9.95)	$201.22	$116.23	$48.66	$11.48	$367.64
17775953	PORTSMOUTH	9.25	Solar	Inverter	11/6/2014	A-16	10,175	($20.45)	$413.61	$238.91	$100.02	$23.61	$755.70
17722478	EAST GREENWICH	2.75	Solar	Inverter	11/7/2014	A-16	3,025	($6.08)	$122.97	$71.03	$29.74	$7.02	$224.67
18154533	WOOD RIVER JT	3.5	Solar	Inverter	11/10/2014	A-16	3,850	($7.74)	$156.50	$90.40	$37.85	$8.93	$285.94
17281317	NORTH KINGSTOWN	9	Solar	Inverter	11/13/2014	C-06	9,900	($19.90)	$363.13	$205.13	$97.32	$22.97	$668.65
17513659	CUMBERLAND	4.5	Solar	Inverter	11/14/2014	A-16	4,950	($9.95)	$201.22	$116.23	$48.66	$11.48	$367.64
17472940	LINCOLN	5.5	Solar	Inverter	11/17/2014	A-16	6,050	($12.16)	$245.93	$142.05	$59.47	$14.04	$449.33
17372548	WEST KINGSTON	10	Solar	Inverter	11/19/2014	A-16	11,000	($22.11)	$447.15	$258.28	$108.13	$25.52	$816.97
17743158	JAMESTOWN	4	Solar	Inverter	11/19/2014	A-16	4,400	($8.84)	$178.86	$103.31	$43.25	$10.21	$326.79
17732079	WESTERLY	7.25	Solar	Inverter	11/21/2014	A-16	7,975	($16.03)	$324.18	$187.25	$78.39	$18.50	$592.30
17832890	JOHNSTON	5	Solar	Inverter	11/24/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
17354436	CUMBERLAND	4.5	Solar	Inverter	11/25/2014	A-16	4,950	($9.95)	$201.22	$116.23	$48.66	$11.48	$367.64
17833152	LINCOLN	5	Solar	Inverter	11/26/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
17504085	L COMPTON	5	Solar	Inverter	12/1/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
17473280	BRISTOL	6.5	Solar	Inverter	12/10/2014	A-16	7,150	($14.37)	$290.65	$167.88	$70.28	$16.59	$531.03
15049726	WAKEFIELD	4.3	Solar	Inverter	12/12/2014	A-16	4,730	($9.51)	$192.27	$111.06	$46.50	$10.97	$351.30
18469711	WAKEFIELD	5	Solar	Inverter	12/16/2014	A-16	5,500	($11.06)	$223.58	$129.14	$54.07	$12.76	$408.49
17824272	WESTERLY	10.5	Solar	Inverter	12/19/2014	A-16	11,550	($23.22)	$469.51	$271.19	$113.54	$26.80	$857.82
17766993	WEST KINGSTON	14.25	Solar	Inverter	12/22/2014	a-16	15,675	($31.51)	$637.19	$368.05	$154.09	$36.37	$1,164.18
17473990	BARRINGTON	5.5	Solar	Inverter	12/23/2014	A-60	6,050	($12.16)	$164.44	$142.05	$59.47	$14.04	$367.84
18560388	MIDDLETOWN	2.75	Solar	Inverter	12/29/2014	A-16	3,025	($6.08)	$122.97	$71.03	$29.74	$7.02	$224.67
16960369	NEWPORT	3	Solar	Inverter	12/30/2014	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
18416675	PEACE DALE	6	Solar	Inverter	12/30/2014	A-16	6,600	($13.27)	$268.29	$154.97	$64.88	$15.31	$490.18
13276481	WAKEFIELD	3	Solar	Inverter	3/24/2010	A-16	3,300	($6.63)	$134.15	$77.48	$32.44	$7.66	$245.09
13169627	COVENTRY	100	Solar	Inverter	2/27/2012	G-2	110,000	($221.10)	$755.70	$983.40	$1,081.30	$255.20	$2,854.50
13213633	CRANSTON	500	Solar	Inverter	12/27/2013	G-2	550,000	($1,105.50)	$3,778.50	$4,917.00	$5,406.50	$1,276.00	$14,272.50
Totals	**420**	**12,393.18**					**23,655,459**	**($47,547.47)**	**$259,701.18**	**$261,365.16**	**$232,533.16**	**$54,880.67**	**$760,932.70**

TASC EXHIBIT CG-3

THE NATIONAL ASSOCIATION OF STATE UTILITY CONSUMER ADVOCATES RESOLUTION 2015-1:

OPPOSING GAS AND ELECTRIC UTILITY EFFORTS TO INCREASE DELIVERY SERVICE CUSTOMER CHARGES

THE NATIONAL ASSOCIATION OF STATE UTILITY CONSUMER ADVOCATES RESOLUTION 2015-1

OPPOSING GAS AND ELECTRIC UTILITY EFFORTS TO INCREASE DELIVERY SERVICE CUSTOMER CHARGES

Whereas, the National Association of State Utility Consumer Advocates ("NASUCA") has a long-standing interest in issues and policies that ensure access to least-cost gas and electric utility services, which are basic necessities of life in modern society; and

Whereas, in recent years, gas and electric utilities have sought to substantially increase the percentage of revenues recovered through the portion of the bill known as the customer charge, which does not change in relation to a residential customer's usage of utility service, through proposals to increase the customer charge or through the imposition of what have been called Straight Fixed Variable or SFV rates; and

Whereas, these gas and electric utilities have sought to justify such increases by arguing that all utility delivery costs are "fixed" and do not vary with the volume of energy supply delivered to customers, and that reductions in customer usage due to conservation and energy efficiency increase the risk of non-recovery of utility costs; and

Whereas, based on these arguments, these gas and electric utilities have proposed that a greater percentage of utility costs (distribution costs such as electric transformers and poles and natural gas mains, traditionally recovered through volumetric rates) should be collected from customers through flat, monthly customer charges; and

Whereas, gas and electric utilities' own embedded cost of service studies,[1] in fact, show that a substantial portion of utility delivery service costs are usage-related, and therefore, subject to variation based on customer usage of utility service; and

Whereas, increasing the fixed, customer charge through the imposition of SFV rates or other high customer charge structures creates disproportionate impacts on low-volume consumers within a rate class, such that the lowest users of gas and electric service shoulder the highest percentage of rate increases, and the highest users of utility service experience lower-than-average rate increases, and even rate decreases,[2] in some instances; and

Whereas, nationally recognized utility rate design principles call for the structuring of delivery service rates that are equitable, fair and cost-based; and

Whereas, SFV and other high customer charge rate design proposals, in which low-use customers would see greater than average increases, while high-use customers would experience lower-than-average increases and even decreases in their total distribution bill, are unjust and inconsistent with sound rate design principles; and

Whereas, data collected by the U.S. Energy Information Administration show that in a vast majority of regions called "reportable domains,"[3] low-income customers (with incomes at or below 150% of the federal poverty level) on average use less electricity than the statewide residential average and less than their higher-income counterparts;[4] and

Whereas, these data also show that in every reportable domain but one, elderly residential customers (65 years of age or older) use less electricity on average than the statewide residential average and less than their younger counterparts;[5] and

Whereas, these data also show that in a vast majority of reportable domains, minority (African American, Asian and Hispanic) utility customers on average use less electricity than the statewide residential average and less than their Caucasian counterparts;[6] and

Whereas, data from the U.S. Department of Energy's Residential Energy Consumption Survey for the Midwest Census region, show that natural gas consumption increases as income increases, and that higher incomes lead to occupation of larger sizes of housing units,[7] thereby increasing the likelihood of higher gas utility usage, and that natural gas usage increases as income increases in the vast majority of reportable domains throughout the U.S;[8] and

Whereas, given these documented usage patterns, the imposition of high customer charge or SFV rates unjustly shifts costs and disproportionately harms low-income, elderly, and minority ratepayers, in addition to low-users of gas and electric utility service in general; and

Whereas, because the imposition of high customer charge or SFV rates results in a smaller percentage of a customer's utility bill consisting of variable usage charges, customers' incentive to engage in conservation as well as federal and state energy efficiency programs is significantly reduced; and

Whereas, NASUCA supports the adoption of cost-effective energy efficiency programs as a means to reduce customer utility bills, help mitigate the need for new utility infrastructure, and provide important environmental benefits; and

Whereas, given that the imposition of high customer charge or SFV rates means that a smaller percentage of a customer's utility bill is derived from variable usage charges, the imposition of SFV-type rates reduces the ability of utility customers to manage and control the size of their utility bills;

Now, therefore, be it resolved, that NASUCA continues its long tradition of support for the universal provision of least-cost, essential residential gas and electric service for all customers**;**

Be it further resolved, that NASUCA *opposes* proposals by utility companies that seek to increase the percentage of revenues recovered through the flat, monthly customer charges on residential customer utility bills and the imposition of SFV rates;

Be it further resolved, that NASUCA urges state public service commissions to reject gas and electric utility rate design proposals that seek to substantially increase the percentage of revenues recovered through the flat, monthly customer charges on residential customer utility bills – proposals that disproportionately and inequitably increase the rates of low usage customers, a group that often includes low-income, elderly and minority customers, throughout the United States;

Be it further resolved, that state public service commissions should promote and adopt gas and electric rate design policy that minimizes monthly customer charges of residential gas and electric utility customers in order to ensure that delivery service rates are equitable, cost-based, least-cost, and encourage customer adoption of conservation and federal and state energy efficiency programs.

Be it further resolved that NASUCA authorizes its Executive Committee to develop specific positions and to take appropriate actions consistent with the terms of this resolution.

Submitted by Consumer Protection Committee

Approved June 9, 2015
Philadelphia, Pennsylvania

No Vote: Wyoming
Abstention: Vermont

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[1]*See, e.g.,* Illinois Commerce Commission Docket No. 14-0244/0225, *Peoples Gas Light & Coke Co. – Proposed Increase in Delivery Service Rates,* PGL Ex. 14.2, p. 1, lines 8, 14, 38 and 42, col. D; Illinois Commerce Commission Docket No. 13-0384, *Commonwealth Edison Company,* AG Ex. 1.0 at 12-13, *citing* ComEd Ex. 3.01, Sch. 2A, p. 13, col. Tot. ICC, line 248.

[2]ICC Docket No. 14-0224/0225, AG Ex. AG/ELPC Ex. 3.0 at 15, 25.

[3]The U.S. Energy Information Administration's Residential Energy Consumption Survey provides detailed household energy usage and demographic data for 27 states or regions of the U.S. referred to as "reportable domains."

[4]*See* Wis. Pub. Serv. Com'n Docket No. 3270-UR-120, *Application of Madison Gas and Electric Co. for Authority to Adjust Electric and Natur4al Gas Rates,* Public Comments of John Howat, National Consumer Law Center, October 3, 2014, *citing* 2009 U.S. EIA Residential Energy Consumption Survey data by "Reportable Domain" at 5-6.

[5]*Id.* at 7-8.

[6]U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey.

[7]*See* ICC Docket No. 14-0224/0225, *North Shore Gas, Peoples Gas Light & Coke Company – Proposed Increase in Gas Rates,* AG Ex. 4.0 at 11-12; AG Ex. 4.1, RDC-5, p.1-3.

[8]U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey.