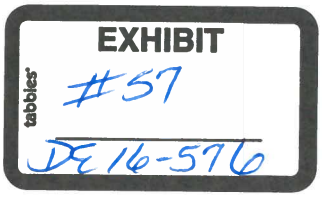

STATE OF NEW HAMPSHIRE

BEFORE THE

PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 16-576

REBUTTAL TESTIMONY OF

ELLEN HAWES

ON BEHALF OF ACADIA CENTER

December 20th, 2016

List of Exhibits

Exhibit AC-1	Acadia Center UtilityVision Report
Exhibit AC-2	Acadia Center Next Generation Solar Framework for New Hampshire

I. INTRODUCTION

Q. Please state your name, business address and position.

A. My name is Ellen Hawes. I am a Senior Policy Analyst, Energy Systems and Carbon Markets at Acadia Center. My office is located at 47 Blood Hill Rd., Norwich, Vermont 05055. Tel. (802) 649-1140.

Q. Have you ever testified before the Commission before?

A. Yes, I testified before the Commission in docket DE 15-137, Energy Efficiency Resource Standard.

Q. Please tell me more about Acadia Center.

A. Acadia Center is a non-profit, research and advocacy organization committed to advancing the clean energy future in the Northeast. Acadia Center is at the forefront of efforts to build clean, low carbon and consumer friendly economies. Acadia Center's approach is characterized by reliable information, comprehensive advocacy and problem solving through innovation and collaboration. Acadia Center's staff has a combined several decades of experience on the impact of utility rate design on consumer adoption of energy efficiency and clean energy technologies, and the ability of consumers to control their energy bills.

Acadia Center has been active in New Hampshire and other northeastern states in researching and promoting consumer-friendly rate design that preserves incentives to use energy wisely, gives consumers greater control over energy bills, and modernizes net metering tariffs to account for economic costs and benefits. Acadia Center experts have researched and written about utility rate design in a distributed energy future, including

"UtilityVision," "Utility Rate Design Principles for Advancing a Consumer-Friendly Energy System," and the "Next Generation Solar Framework".

Acadia Center has participated in public utility dockets relating to electric rate design in: Massachusetts, including Department of Public Utilities Docket 15-155; Connecticut, including Public Utility Regulatory Authority Dockets No. 14-05-06 and 16-02-30; and Rhode Island, including Public Utility Commission Docket No. 4568. Acadia Center is also participating in Case 15-E-0751 at the New York State Public Service Commission, which includes policy decisions on an interim successor to net energy metering.

Q. Please summarize your qualifications and experience.

A. I have worked at Acadia Center as an analyst for the past 10 years, focusing on New Hampshire for the past three years. I have participated as a stakeholder in the 10-Year State Energy Strategy process pursuant to RSA 4:E. At the Public Utility Commission, I participated in the docket related to an Energy Efficiency Resource Standard, DE 15-137, and am a member of the Grid Modernization Working Group established in IR 15-296. I received my BA in international relations from Brown University and a Master of Forestry degree from Yale School of Forestry and Environmental Science.

Q. What is the purpose of your testimony?

A. I offer this testimony in response to the pre-filed testimony submitted by various parties on October 24th. My testimony addresses how net metering compensation aligns with Acadia Center's vision for overall rate design reforms, and outlines the costs and

benefits of distributed solar. I propose an alternative net metering tariff, which creates monetary crediting for all projects and separate structural reforms for new small projects (100 kW or less) and large projects (above 100 kW), and grandfathers existing net metering customers under existing rules. Finally, I respond to several specific elements of tariff structures proposed by other parties: 1) Eversource and Unitil's proposed demand charges for new DG customer classes; 2) issues around minimum bills; 3) Liberty's and Unitil's proposal for the elimination of banking; 4) time-varying rates; and 5) the alternative net metering tariff proposed by the City of Lebanon.

II. THE CHANGING ENERGY SYSTEM AND NECESSARY REFORMS

Q. Please describe emerging trends in the energy system that are relevant to this proceeding.

A. Electric customers increasingly have access to new lower cost technologies that enable clean local generation and customer engagement. Traditional utilities are in the midst of a paradigm shift as demand for these technologies and states' public policy goals require a new utility business model to accelerate the deployment of clean energy resources, including energy efficiency and distributed energy resources. Many jurisdictions are exploring how policy and regulatory change – including rate reform and changes to net metering structures – can enable utilities to become full partners and remove barriers to the deployment of clean energy resources and advance consumer choice and control. Such changes will influence the pace at which the energy system shifts to a more decentralized model with significant levels of local, distributed energy

resources. The New Hampshire Public Utilities Commission is currently examining some of these questions through the grid modernization docket, IR 15-296.

Q. How will ratepayers, citizens, and states benefit from the changing energy system?

A. Investing in clean local energy resources like energy efficiency and distributed solar PV helps avoid expensive distribution, transmission, and large-scale generation investments, and provides economic benefits, including good local jobs. It is well documented that energy efficiency investments have allowed the region to avoid or defer major transmission upgrades. Similarly, the Tiverton/Little Compton pilot project in RI, the Brooklyn/Queens Demand Management project in NY, and the Boothbay pilot project in ME are real-world examples of local clean energy resources deferring or avoiding upgrades to the distribution grid.

The key concept is that customers are no longer just cost centers to whom a fair share of system costs must be allocated. Customers, and a whole host of demand-side resources connected to the distribution grid, are now able to provide major ratepayer and societal benefits, but they need a proper incentive structure to do so.

Q. Has Acadia Center explored how to reform utility regulation to realize the benefits of a modern, low-carbon energy system?

A. In February 2015, Acadia Center released "UtilityVision," a framework laying out reforms to utility regulation to move towards a fully integrated, flexible, and low carbon electric grid that puts consumers at the center. I submit this document as Exhibit AC-1. The three categories of reforms are: (1) comprehensive, proactive, and coordinated planning for the electric grid; (2) updated roles for regulators, utilities, and stakeholders; and, (3) fair pricing and consumer protection for all.

Q. Does UtilityVision recommend reforming retail electricity rates and net metering structures?

A. Yes, UtilityVision makes separate recommendations for 'How Consumers Pay for the Power They Use' and 'How Consumers Get Paid for the Power They Produce.' In the long run, these reforms are tightly linked but they can be considered separately in the shorter term.

Q. How do these recommendations relate to historic principles for retail rate design?

A. Discussions on retail rate design often refer to a long list of general principles laid out by James Bonbright in 1961. These are often summarized or referred to in short hand, but in full they are:

1. The related, "practical" attributes of simplicity, understandability, public acceptability, and feasibility of application.
2. Freedom from controversies as to proper interpretation.
3. Effectiveness in yielding total revenue requirements under the fair-return standard.
4. Revenue stability from year to year.
5. Stability of the rates themselves, with a minimum of unexpected changes seriously adverse to existing customers. (Compare "The best tax is an old tax.")
6. Fairness of the specific rates in the apportionment of total costs of service among the different customers.
7. Avoidance of "undue discrimination" in rate relationships.
8. Efficiency of the rate classes and rate blocks in discouraging wasteful use of service while promoting all justified types and amounts of use:

a. In the control of the total amounts of service supplied by the company:

b. In the control of the relative uses of alternative types of service (on-peak versus off-peak electricity, Pullman travel versus coach travel, single-party telephone service versus service from a multi-party line, etc.). (Principles of Public Utility Rates, James C. Bonbright, Columbia University Press 1961, p. 291)

Although these long-standing principles are helpful guideposts on certain questions, they are very general and do not necessarily provide concrete answers to regulators dealing with 21st century issues. In writing UtilityVision, these principles were taken into account, but we went beyond them to provide more concrete recommendations.

Q. What are the concrete principles for retail rate reform laid out in UtilityVision?

A. First, regulators should avoid reliance on high fixed charges. Fixed charges limit consumer control and unduly burden low usage consumers, a disproportionately low-income segment of consumers. These charges should be capped at the cost of keeping a customer connected to the grid, such as metering, billing, and the service drop, but public policy considerations can be factored in to keep these charges even lower. Second, other components of electricity rates can be reformed to better align customer incentives with cost drivers and the value the customer can provide to the system. Third, ratepayers must be able to understand significant reforms and must have a basis on which to respond. Consumer education is a necessary component of reform, and customers must be given the proper tools to manage their bills.

Q. Have other related sets of principles been recommended?

A. Regulatory Assistance Project ("RAP") has recently proposed a related set of three principles in Smart Rate Design for a Smart Future[1]:

1. A customer should be able to connect to the grid for no more than the cost of connecting to the grid.

2. Customers should pay for grid services and power supply in proportion to how much they use these services and how much power they consume.

3. Customers who supply power to the grid should be fairly compensated for the full value of the power they supply.

Q. Please described how net metering fits into overall rate design reform.

A. Net metering structures and credit definitions are now a key part of retail rate design. Retail rate net metering and credit rollover has become a simple and popular method for compensating customers with clean distributed generation. Currently in New Hampshire, excess generation produced by net-metered customers is credited to the next bill as a kWh credit at the retail rate and carried forward indefinitely. At the end of the year, default service customers with excess generation over 600 kwh may elect to receive payment for any credit balance at the utility's avoided cost rate. The rules distinguish between small customer-generators (up to and including 100 kilowatts) and large customer-generators (greater than 100 kW and up to 1 MW). For systems up to 100 kW, a retail meter that measures net inflow and outflow of electricity is used. A bi-directional meter capable of reading interval data is used for larger systems. Additionally, New

[1] 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

Hampshire allows group net metering for default service customers. The kWh credits generated by a host system are shared between the members of the group.

Q. What issues should be addressed in this proceeding?

A. The primary issues that should be addressed in this proceeding are net metering credit structures, namely what the components are and how each component is determined. This can be done separately for different categories of projects based on the ability of different customer types to handle increased complexity and the need for gradualism.

While Acadia Center agrees with testimony filed by other parties, such as Patrick Bean on behalf of the Energy Freedom Coalition of America, stating that the utilities have not met the burden of proof that significant cost shifts are currently occurring between net metered customers and non-net metered customers, we see this proceeding as an opportunity to transition net metering structures towards more accurate and precise structures based on the net value of distributed generation to the electric system.

Q. What principles and guidelines has the Commission determined it will follow for this proceeding?

A. In its Order, the Commission states "In developing such alternative tariffs and any limitations on their availability, RSA 362-A:9, XVI requires that the Commission consider: the costs and benefits of customer-generator facilities; an avoidance of unjust and unreasonable cost shifting". Furthermore it states that it will be guided by the legislative purposes stated in HB 1116, "including, among other things, the continuance of reasonable opportunities for electric customers to invest in and interconnect customer-generator facilities and receive fair compensation for such locally produced power while

ensuring costs and benefits are fairly and transparently allocated among all customers, and the promotion of a balanced energy policy that supports economic growth and energy diversity, independence, reliability, efficiency, regulatory predictability, environmental benefits, a fair allocation of costs and benefits, and a modern and flexible electric grid that provides benefits for all ratepayers".

Q. How does this fit with the principles described earlier from Bonbright, Acadia Center and the Regulatory Assistance Project?

A. The principles articulated by the Commission fit together well with the principles from Bonbright, Acadia Center and the Regulatory Assistance Project. In particular, consideration of the costs and benefits of customer-generator facilities aligns well with the principles of efficiency, cost causation, and fair payment for value.

Q. How should broader questions of rate design reform should be considered?

A. The larger questions of rate design should generally be taken up in other proceedings, such as distribution rate cases and the Investigation into Grid Modernization (IR 15-296). However, principles and possible future changes can be part of discussion here. Proposals for increased fixed charges, demand charges, and time of use rates are incorporated into net metering tariff proposals submitted by various parties, and must be considered in the light of how they align with a larger vision for rate design reform.

III. ACADIA CENTER PROPOSAL FOR ALTERNATIVE NET METERING TARIFFS

Q. What are Acadia Center's recommendations for immediate changes in this proceeding?

A. Acadia Center recommends the adoption of monetary crediting and separate structural reforms for new small projects (100 kW and below) and large projects (above 100 kW). These recommended structural reforms are both gradual and it is likely that customers involved in large projects can adapt to a modestly more significant reform in the short term than customers involved in small projects. As allowed by the statute, existing net metering customers should be grandfathered under existing rules.

Q. How do these immediate recommendations relate to Acadia Center's long-term vision?

A. As we do not yet have the right information and visibility into the distribution system, knowledge of detailed distribution-level cost drivers, customer education, and load management technology to implement Acadia Center's long-term vision now, these recommendations take an important first step. In the coming years, periodic reviews of net metering structures and broader rate design should run in parallel to grid modernization efforts that will enable Acadia Center's long-term vision.

Q. What should the main goal of new net metering tariffs be?

A. A net metering tariff should seek to better align net metering credits with the long-run value that distributed generation provides to the electric system. This must be accomplished in a manner that is consistent with other rate design principles, such as gradualism and simplicity, and with public policy goals.

Q. What does Acadia Center see as the long-run value of distributed generation to the electric system?

A. Distributed generation, like solar photovoltaic systems, offers unique value to the electric grid by providing power during peak periods and reducing the need for large infrastructure investments in all segments of the electric system: generation capacity, transmission, and distribution. In addition, clean DG avoids emissions from conventional power plants and lowers the long-term cost of compliance with environmental and public health requirements. The overall value of solar and other DG is the sum of these different benefits, which vary based on the generation profile and other characteristics.

Q. Why is long-run value to the electric system the right principle on which to base the net metering tariffs?

A. The principal of value to the electric system, which can alternatively be phrased as avoided costs, aligns strongly with the principle of cost causation and the proper consideration of costs and benefits as discussed above. Long-run value is important because ratepayers are not only impacted by short term costs. Many frameworks for the regulation and pricing for electric system infrastructure are based on long-term principles. If the same considerations are not applied to distributed generation, the system will become biased towards expensive investments in regional infrastructure.

Q. Should net metering customers be placed in separate rate classes?

A. No. Acadia Center's recommended changes should be applied through riders that determine credit values for net exports. Customers with distributed generation should not be put in separate rate classes for several reasons, including risk of discriminatory treatment and inhibition of DG adoption. In future distribution rate cases, non-

discriminatory rate design changes and other gradual changes to net metering structures can ensure that distribution generation customers pay for their fair share of embedded distribution system costs.

Q. What immediate changes should be made for all types of net metering customers?

A. New Hampshire's current net energy metering policy for solar employs volumetric crediting. A policy more tailored to valuing distributed generation would consist of monetary crediting to be applied on a per-kWh basis. This approach is more flexible and allows for smarter pricing than traditional volumetric crediting, which tracks only the amount of electricity generated and cannot accommodate details like the time or location at which the electricity was generated. Monetary crediting also allows for innovations such as time-varying rates to be incorporated in net metering credits.

Q. Should any caps or other limitations apply if Acadia Center's proposals are adopted?

A. No. Acadia Center's proposal with respect to larger projects addresses concerns about cross-subsidies that are the primary reason for caps. Acadia Center's proposal for smaller projects takes steps to address these issues as well, and subsequent reviews can further address these issues.

Alternative Net Metering Tariff for Large Projects

Q. What immediate changes should be made to the net metering compensation structure for projects over 100 kw?

A. For solar projects with significant exports, such as group net metering and projects above 100 kw, the crediting structure should be revised in accordance with Acadia Center's Next Generation Solar Framework for New Hampshire (Exhibit AC-2).

Q. Please summarize the recommendations in the Next Generation Solar Framework for New Hampshire.

A. The proposed credit structure for these solar projects is composed of three basic elements and two optional elements for which individual projects could qualify. The first element is the ***electricity supply credit*** equal to the applicable electricity supply rate. This represents many of the energy and capacity-related values of solar, while also ensuring customer benefits. The second element is a ***delivery system benefit credit***. This represents an average value of distributed generation with respect to the transmission and distribution system and, if desired, transmission and distribution could be separated out. The third and final element is an ***energy system benefit credit*** that includes additional values not captured by the electricity supply and delivery system benefit credits. In addition, new credits can be created for specific categories of projects, such as a ***west-facing solar credit*** or a ***locational credit*** for solar PV in constrained areas of the grid. The appropriate set of customers to which the value accrues should pay for the credits. For example, only the distribution utility should pay for distribution-related credits, while the energy system benefit credit can be paid for on a broader basis.

Q. How would this framework apply to other technologies?

A. This framework is most easily applied to non-dispatchable technologies where an expected generation profile can be used to estimate the correct values for the elements of the credits. For dispatchable technologies, an expected generation profile can also be developed to apply this framework, but values may be less accurate given that the customer-generator will have discretion about dispatch choices. As a result, development of time-varying credits would result in a more appropriate structure for dispatchable technologies.

Q. How can we determine the long-run costs and benefits of distributed solar energy for this proceeding?

A. The direct testimony filed by R. Thomas Beach is an appropriately rigorous analysis to determine the long-run costs and benefits of distributed solar in this proceeding[2]. *Figure ES-1* in Beach's testimony shows the quantification of the principal benefits of solar DG for the each of the utilities, expressed in 25-year levelized cents per kWh. These values support the conclusion that distributed solar is a cost-effective resource for these utilities, as the benefits equal or exceed the costs in the Total Resource Cost and Societal tests. With respect to the Next Generation Framework proposal, the values in Table D-12 can be used to estimate values for Acadia Center's proposed credit structure. For example, the delivery value credit would be equal to the sum of transmission and distribution value, approximately 4 cents per kWh for Eversource

[2] Acadia Center released an analysis, *Value of Distributed Generation, Solar PV in New Hampshire*, in October of 2015. In his direct testimony, Edwin Overcast raised several questions related to this study. Acadia Center supports the methodologies and conclusions of its analysis fully, but as the study has not been submitted as evidence in this proceeding, Acadia Center feels it is inappropriate to address his questions here.

service territory, approximately 5 cents per kWh for Liberty service territory, and approximately 3 cents per kWh for Unitil service territory.

Q. Have other parties made proposals similar to Acadia Center's in this docket?

A. Yes, James Bride on behalf of New Hampshire Sustainable Energy Association and the fixed solar credit rate by Lon Huber on behalf of the Office of Consumer Advocate.

Q. What net metering tariff does Bride propose for commercial and industrial customers?

A. Bride proposes that the C&I rate be equal to default energy *plus* transmission *plus* adders. The adders for benefits include:

- Location in constrained circuit as part of a non-wires alternative to a capital-intensive upgrade
- Location on a brownfield, landfill, or otherwise unusable property
- West facing solar panels that help provide peak load reduction later in the day
- Solar PV or other distributed generation paired with energy storage that is optimized to provide peak load reduction or ancillary services to the electric grid

Q. How does Bride's approach compare to the crediting structure you propose above?

A. Bride and Acadia Center's approaches are similar, by providing additional credits to projects that provide additional services to the grid. However, there are differences with respect to transmission value, distribution value, and the inclusion of certain other incremental electric system benefits. Lastly, location on a brownfield is better addressed through incentive programs, since it is not an electric system value.

Q. How does the Acadia Center proposal compare to the fixed solar credit rate from the Office of Consumer Advocate?

A. There is some overlap between the Next Generation Solar Framework and elements of the fixed charge solar credit for small scale DG. In both proposals, the retail supply credit would remain the same and a new delivery credit would be created. But there are significant differences as well. The Next Generation Solar Framework immediately moves to a value-based credit for delivery, instead of a step down, and creates a new credit to recognize other elements of value. The Next Generation Solar Framework does not include any provision for the exchange of renewable energy credits for a supplemental credit rate. Lastly, Acadia Center's proposal would apply to larger systems and only apply to net exports.

Alternative Net Metering Tariff for Small Projects

Q. What immediate changes would you propose for net metering for small projects?

A. Acadia Center recommends that for small projects that the retail net metering compensation structure be maintained in the most part. However, several elements of the full retail rate should be excluded from the credit received for exported energy and, as described above, compensation should be done through monetary crediting, as opposed to volumetric crediting.

Q. What should be included in the definition of small projects?

A. The definition of small projects can reasonably remain consistent with the existing statute. A cutoff of 100 kW and below is reasonable threshold for projects that need

simpler structures to continue in the market and raise little risk of inordinate overall levels of unreasonable cross-subsidies.

Q. What elements should be excluded from credit value for small projects and why?

A. Net metering customers receiving monetary credit for net exported energy should have the following elements removed:

- Systems Benefit Charge (SBC)
- Electricity Consumption Tax
- Stranded Cost Recovery Charge

These charges do not represent values that are avoided by distributed generation.

Q. Have other parties made similar proposals for small projects in this docket?

A. Yes, Acadia Center's proposal is identical to James Bride and similar to a proposal from Paul Chernick on behalf of Conservation Law Foundation.

Q. Please briefly explain Paul Chernick's proposal on behalf of Conservation Law Foundation for residential net metered customers?

A. Chernick proposes maintaining existing net metering for residential customers. However, he recommends excluding the Systems Benefit Charge (SBC) from the export credit value. He also notes that in certain circumstances exclusion of stranded cost recovery and electricity consumption tax might be justified.

Q. Do Bride and Chernick propose revisiting net metering compensation for residential customers?

A. Yes, Bride proposes reviewing the costs and benefits of net metering using pre-determined methodology (described in the testimony by Phelps) when penetration reaches set thresholds of 5%, then 10%, etc. Chernick proposes a stakeholder review at a

market penetration rates of 5% and a full regulatory review at a market penetration rate of 10%.

Q. Do you agree with either of these proposals for reforming net metering for small projects?

A. Either proposal is a reasonable way forward.

IV. RESPONSES TO SELECTED OTHER PROPOSALS

Q. What other issues in other parties' proposals would you like to address?

A. I would like to respond to 1) Eversource and Unitil's proposed demand charges for new DG customer classes; 2) minimum bills; 3) Liberty's and Unitil's proposal for the elimination of banking; 4) time-varying rates; and 5) the alternative net metering tariff proposed by the City of Lebanon.

Q. Please briefly describe the demand charge included in Eversource's proposal.

A. Eversource is proposing creating new DG rates for net metering customers, corresponding to existing rate classes. In its proposed DG rates, Eversource has converted the per kWh distribution and transmission rates of existing Residential Rate R and General Service Rate G to a per kW basis. They propose a $5.82 per KW distribution charge and a $3.31 charge per KW transmission charge for residential customers.

Q. Please briefly describe Unitil's demand charge proposal?

A. Unitil proposes to create a separate rate class for DG customers, Schedule DDER. Residential customers who install DG of more than 100 kW would be considered General Service G2 Customers for billing purposes. Schedule DDER would consist of a three-part net metering rate for the solar DG customers consisting of a customer charge, a distribution demand charge based on the maximum demand on the delivery system and a

time differentiated energy charge based on the default supply charges. The demand charge would be calculated by converting the per kWh distribution rate to a charge per kW of demand (15 minute interval) of $5.32.

Q. Does Acadia Center support demand charge proposals put forward by Unitil and Eversource?

A. No, for several reasons. First, these proposals create new rate classes for DG customers, with distinctly different treatment for net metering customers and not only adjusting credit value for net exports. Second, Acadia Center believes that in the short-term, demand charge proposals do not satisfy understandability and bill management principles. Significant customer education would be required and advanced energy management technologies may be the only way to allow residential customers to manage demand charges. Third, demand charges based on individual customer peaks do not satisfy cost causation principles. Despite these concerns, well-designed demand charges, coinciding with local or system peaks, are an option to consider in the long-run and must respond to customers' behavior in a timely way to reflect the benefits of efficiency, demand response, or other customer actions and investments.

Demand charges that are more appropriate for large commercial and industrial customers, who may have a dedicated substation or circuit, may not be appropriate or related to cost causation for residential customers who share distribution components down to and including the final line transformer, and whose individual peaks are averaged out with other residential customers served by the same infrastructure. Small residential customers are less likely to have their individual maximum usage coincide with the time of the system peak demand. Non-coincident demand charges are also not

likely to provide system benefits, since they do not necessarily align with system or local peaks. If demand charges aligned with system peaks prove too complex for mass-market residential customers, time-varying distribution rates that mimic peak coincident demand are an excellent alternative.

Q. Are minimum bills a potential solution?

A. Residents and businesses want control over their electricity costs; high fixed charges or minimum monthly bills for electric service will decrease that control. A minimum monthly bill is a fee for low-usage that kicks in when a customer's energy consumption drops below a certain level. While fixed charges and minimum bills increase the certainty of the timing of revenue collections for utilities, they reduce consumer control over energy bills, undermine other rate design principles such as cost causation and the broader clean energy future, and often conflict with efficiency and clean energy policies. Minimum bills also risk adversely impacting low-income consumers, who tend to use less energy and are disadvantaged disproportionately by loss of control over a fixed portion of bills.

A binding minimum bill removes incentives for customers to invest in energy efficiency. Similarly, if time-varying rates are available, a binding minimum bill removes incentives to shift load from on-peak to off-peak. A minimum bill also does not distinguish between customers with very different load characteristics. For example, a customer with sized-to-load 10 kW solar panels and a customer with sized-to-load 3 kW solar panels are not the same, but a minimum bill might have them both pay $10 every month. The first customer is bigger in the most relevant senses and should be paying more for the distribution grid.

Q. Have any parties recommended eliminating banking of credits?

A. Yes. Liberty's proposed alternative tariff structure eliminates banking excess energy to be credited in future months as a way to reduce cost shifting. In addition, Overcast on behalf of Unitil also argues that banking adds to cost shifting, and recommends that the Commission should consider the elimination of banking of cumulative excess energy.

Q. Do you believe that banking of credits contributes to cost shifts?

A. Banking of credits allows customers to receive compensation for the monetary value they are providing. Reasonably valued credits that can be banked and rolled over provide good economic incentives for customers and should not raise concerns about inappropriate cost shifting.

Q. What role do you see for time-varying rates in this proceeding?

A. If reasonably aligned with the hours that cause costs, time-varying rates provide better economic incentives to reduce overall costs and create opportunities for customers to save money by taking advantage of low-cost hours. Time-varying rates for all customer classes are being discussed in IR-15-296. If time-varying rates are applied, netting of credits could be done by time period. In addition, the value of distribution for exported energy could be different than the rate paid for imports.

Acadia Center is open to time of use rates and pilots, but does not propose a specific one here. A pilot for TOU rates could provide additional data and learning experience to help expand the use of these rates to DG customers or all customers.

Q. What do Below and Chernick propose for time-varying rates for commercial and industrial customers?

A. Below proposes as a medium-term step to move from demand charges to time-varying rates for commercial and industrial customers. Chernick recommends the Commission initiate a review of rate design, to investigate the feasibility of replacing demand charges with time-varying rates and of expanding time-varying rates to additional tariff classes. He highlights the fact that TVR for smaller customers would necessitated additional meter investments that should be considered as part of the grid modernization investigation, and that larger customers are more able to respond to complexity.

Q. Do you believe either of those are reasonable?

A. Yes. Commercial and industrial customers have a greater ability to respond to rates that vary the portions of costs that vary by time. However, not everything currently included in consumption rates varies by time and the distribution companies must have a reasonable opportunity to recover embedded costs and earn a fair rate of return. Consistent with these constraints, future time-varying rate reforms can differentiate between the export credit, based on value as in the Next Generation Solar Framework, and the rate for imports.

Q. Is the DG TOU Rate option proposed by Lon Huber a reasonable solution?

A. I do not believe that the adoption of Huber's time of use rate approach is warranted at this time. As described above, time-varying rates have considerable merit, but practical implementation raises numerous questions that deserve serious debate. Aspects of this proposal appear to be well-founded, such as the proposed 2 pm to 8 pm

on-peak period. However, Acadia Center disagrees with a number of details of the proposed DG TOU rate, notably the Export Charge and the application of charges to separately metered gross consumption. First, with respect to the Export Charge, Acadia Center believes that it is more appropriate to include recovery of embedded costs in import rates because it can be applied in a non-discriminatory manner to all customers equally. Second, gross consumption is never an appropriate metric for cost causation because self-generation that is consumed instantaneously on-site by definition does not impact the electric system. Lastly, it is clear that energy supply costs vary by time. The DG TOU Rate option does not take this into account and provides no reason for this omission.

Q. Do you agree with Clifton Below's proposal for an alternative tariff on existing default service with existing meters?

A. Clifton Below, in his direct testimony for the City of Lebanon, proposes that a credit continue to be allowed to be carried forward for default service and transmission charges, but not for distribution services and other minor charges, at least for solar. In addition, he proposes customers pay a RPS compliance adder if they generate and sell RECs for their entire production (as opposed to only their net annual exports), equal to that included in default service rates.

I believe it is more appropriate to either continue to credit distribution at the full retail rate in the short-term, or move towards setting a value for a distribution system benefit, as described above.

V. CONCLUSIONS

Q. Please summarize your testimony.

A. Net metering in New Hampshire should start to transition from current net metering structures to value-based net metering credits for group net metering and for larger commercial and industrial projects. Projects 100 kW and under should maintain retail net metering, but gradually transition through a process of iterative rate design and net metering reforms in the coming years. As a first step, the Commission could exclude a limited number of charges not related to avoided costs, combined with subsequent review and consideration of additional reforms at predetermined thresholds, such as the 5% and 10% market penetration rates proposed by CLF and NHSEA.

Reforms should aim to improve cost causation in a gradual way so customers can understand and respond to new rates. Rates that rely on increased fixed charges and individual peak demand should be avoided, and net metered customers should not be treated as a separate class.

Q. Does this conclude your testimony?

A. Yes.