

STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

ORIGINAL	
N.H.P.U.C. Case No.	DE 16-576
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Witness	
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Docket No. DE 16-576

DEVELOPMENT OF NEW ALTERNATIVE NET METERING TARIFFS and/or
OTHER REGULATORY MECHANISM and TARIFFS FOR CUSTOMER GENERATORS

PREFILED DIRECT TESTIMONY OF
KATE BASHFORD EPSEN
ON BEHALF OF
NEW HAMPSHIRE SUSTAINABLE ENERGY ASSOCIATION

October 24, 2016

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Q1. Please state your name, the organization you work for, your position and business address.

A1. My name is Kate Bashford Epsen and I am the Executive Director of the New Hampshire Sustainable Energy Association (“NHSEA”). NHSEA’s business address is 54 Portsmouth Street, Concord, NH 03301.

Q2. Please describe NHSEA and your qualifications.

A2. NHSEA is the largest independent, statewide member-based non-profit dedicated to advancing clean energy in New Hampshire. It was founded in 2003 and has grown since that time into a group with diverse membership that includes homeowners, students, clean energy companies (solar, wind, hydro, biomass, efficiency, cogeneration, etc.), manufacturing companies, retail and service industries, and other institutions. I have been the Executive Director of NHSEA for three and a half years. Previously I worked as an analyst at the NH Public Utilities Commission (the “Commission”) in the Sustainable Energy Division and as an energy consultant with Navigant Consulting and Summit Blue Consulting. I have a BA in environmental policy and economic analysis from Boston University and an MA in international energy management and policy from Columbia University.

Q3. Have you testified previously before the New Hampshire Public Utilities Commission or other regulatory bodies?

1 A3. I have not filed testimony with the Commission before. I have engaged informally and
2 formally as an intervenor in many Commission proceedings and processes, including
3 dockets DE 15-137, DE 14-238, IR 15-296 and DE 10-212.
4

5 **Q4. What is the purpose of your testimony?**

6 A4. The purpose of my testimony is threefold: 1) to introduce NHSEA's three expert
7 witnesses, Nathan Phelps of Vote Solar Richard Norman of Granite State Hydro
8 Association, and James Bride of Energy Tariff Experts; 2) to provide context and
9 evidence that supports maintaining and strengthening net metering in NH and; 3) to state
10 NHSEA's positions on the matters relevant to net metering under consideration in this
11 proceeding and recommendations for the future.
12

13 **Q5. Do energy independence, environmental benefits, economic growth, competitive**
14 **markets, customer choice, and energy diversity each merit consideration in this**
15 **proceeding as factors important to the determination of future net metering tariffs,**
16 **cap limits and other net-metering related parameters?**

17 A5. Yes. In addition to the specific directives that the Legislature gave to the Commission in
18 HB 1116 in section XVI,¹ the Legislature also included important considerations in the
19 Purpose section of the bill that should be promoted and upheld throughout the
20 Commission proceeding [DE 16-576] and in the final Order. The Purpose section states:

21 *"To meet the objectives of electric industry restructuring pursuant to RSA 374-F,*
22 *including the overall goal of developing competitive markets and customer choice*
23 *to reduce costs for all customers, and the purposes of RSA 362-A and RSA 362-F*

¹ https://www.gencourt.state.nh.us/bill_status/billText.aspx?sy=2016&id=293&txtFormat=html

1 *to promote energy independence and local renewable energy resources, the*
2 *general court finds that it is in the public interest to continue to provide*
3 *reasonable opportunities for electric customers to invest in and interconnect*
4 *customer-generator facilities and receive fair compensation for such locally*
5 *produced power while ensuring costs and benefits are fairly and transparently*
6 *allocated among all customers. The general court continues to promote a*
7 *balanced energy policy that supports economic growth and promotes energy*
8 *diversity, independence, reliability, efficiency, regulatory predictability,*
9 *environmental benefits, a fair allocation of costs and benefits, and a modern and*
10 *flexible electric grid that provides benefits for all ratepayers.”*
11

12 These purposes, as well as the purposes of other New Hampshire statutes described
13 herein, all support the use of the Societal Cost Test, as described by Nathan Phelps’
14 testimony. A more detailed explanation of each of the purposes listed above follows:
15 *Economic development and growth:* There are thousands of New Hampshire-based jobs
16 that are directly and indirectly created from the demand for distributed generation
17 (“DG”). According to the Solar Foundation’s 2015 Job Census Report, New Hampshire
18 had over 730 solar jobs; the solar industry nationwide is seeing job growth at a rate that is
19 twelve times faster than the overall economy.² According to the Granite State Hydro
20 Association, New Hampshire’s small hydroelectric industry employed more than 120
21 New Hampshire residents in 2014.³ There are also jobs in the cogeneration industry, the
22 small wind industry, and indirect services such as engineering, electrical contracting, civil
23 contracting, and environmental quality control that are supporting DG project
24 development. The DG market is an important subset of the overall clean tech market,
25 which is growing into a major global industry. The *2015 NH Cleantech Market* report
26 found that average wages in the clean tech industry pay 50% more than New

² <http://www.solarstates.org/#state/new-hampshire/counties/jobs>

³ http://www.granitestatehydro.org/uploads/9/6/9/1/9691817/2015_gsha_fast_facts.pdf

1 Hampshire's average wages and that in New Hampshire, the economic multiplier of clean
2 tech jobs is twice the multiplier of non-clean tech jobs; every job in clean tech adds an
3 additional 1.4 jobs to the state's economy, while jobs in the remainder of the economy
4 only add an additional 0.7 jobs.⁴

5 *Customer choice and market competition:* Consumer choice and [retail] competition are
6 paramount considerations in the restructuring of New Hampshire's electric industry, as
7 detailed in RSA 374-F and supported by part II, article 83 of the NH Constitution, "*Free*
8 *and fair competition in the trades and industries is an inherent and essential right of the*
9 *people and should be protected against all monopolies and conspiracies which tend to*
10 *hinder or destroy it.*"

11 Net metering is a retail policy tool that gives ratepayers a choice to produce and consume
12 electricity that is local, small-scale, and renewable, and to avoid purchases from
13 incumbent monopolies or large-scale, fossil-fuel fired merchant generators.

14 *Energy Diversity:* Energy diversity is fast becoming a serious concern to NH and to the
15 entire New England region. As natural gas continues to supplant coal, oil, and even
16 nuclear generation resources, these non-natural gas generation resources increasingly
17 play an important part in balancing our electric resource portfolio. Keeping hydro-electric
18 resources online, developing new ones where appropriate, increasing solar electric
19 energy, and bringing new renewable energy resources into our statewide and regional
20 electricity portfolio will help control periods of price increases that are due to natural gas
21 supply shortages or natural gas price increases that may be caused by other reasons

⁴ <http://www.nhsea.org/sites/default/files/NHCleantechMarketRep%20FINAL.pdf>

1 beyond transmission supply constraints. A balanced net metering policy that enables the
2 continued growth of DG (and possibly storage) through strong price signals is appropriate
3 for the Commission to employ in order to promote just and reasonable rates for all
4 ratepayers.

5 *Energy Independence:* There are several New Hampshire statutes, including RSA 362-F
6 and 362-A, that promote the goal of energy independence. The Granite State does not
7 have indigenous supplies of fossil fuels. It does have abundant renewable resources:
8 wind, solar, hydro, and biomass. The paramount requirement of electric reliability may
9 be compromised by an over-reliance on resources that we must import, even if they are
10 harnessed by using generation technology that is dispatchable. The intermittent nature of
11 renewable resources is a technological challenge toward reaching the goal of energy
12 independence, but it is not a sufficient reason to disincentive renewable energy and DG
13 deployment: in fact, this challenge is on the verge of a solution through the emergence of
14 storage technology.⁵ Reliability can be improved by the use and development of greater
15 amounts of renewables and DG because they are sited at or close to customer load and
16 because the production curves of wind, hydro, solar, etc. are complementary.

17 *Environmental Benefits:* The environmental benefits of renewable DG are well-proven.
18 The question is whether or not it is appropriate to consider them and value them through
19 a net metering policy. Because the environmental benefits are listed in purpose statement
20 of HB 1116, as well as nearly all of the statutes that form the basis of NH energy policy,
21 it must included in NH's net metering tariffs or alternative tariffs. Otherwise, we would

⁵ For example, see the Massachusetts 2016 report, *State of Charge*, [here](#).

1 be ignoring the purposes of these statutes and not paying deference to the intent of the
2 Legislature (RSA 378:38, RSA 362-F, RSA 362-A, RSA 374-F).

3
4 **Q6. Should there be a limitation on the aggregate amount of capacity that can net meter**
5 **in New Hampshire?**

6 A6. No. New Hampshire's current cap of 100 MW is currently out of step with the cap levels
7 set by surrounding states.⁶ As Table 1 below shows, all other New England states have
8 much higher caps than NH, or no cap at all.

9

⁶ A 100 MW cap represents about 2-3% of the utilities' peak load in New Hampshire. The aggregate cap includes all net-metered DG: residential, commercial and industrial.

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Table 1. Aggregate Cap Levels in New England. Source: www.DSIRE.org

State	Aggregate Cap	Details
Massachusetts	7% of utility's peak load for private entities 8% of utility's peak load for municipalities or government entities	Systems 10 kW and under on a single-phase circuit and systems 25 kW and under on a three-phase circuit are exempt from the private aggregate capacity limit.
Vermont	15% of utility's 1996 peak demand or peak demand during most recent calendar year (whichever is greater)	N/A <i>*Revisions pending that may eliminate cap altogether in 2017.</i>
Connecticut	No limit specified	N/A
Maine	No limit specified	N/A
Rhode Island	3% of peak load for Block Island Power Company and Pascoag Utility District Other Utilities (National Grid): No aggregate cap	N/A

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In addition to the net metering caps set by other New England states, existing New Hampshire state laws neither suggest nor support limiting distributed renewable energy power (i.e. megawatt-hours) nor installed capacity (i.e. megawatts). Under RSA 374-F, *Electric Utility Restructuring*, RSA 362-A, *Limited Electrical Energy Producers Act*, and RSA 362-F, *Electric Renewable Portfolio Standard (RPS)*, the purpose statement language and the details therein describe the benefits of maximizing diverse energy

1 resources, including renewable energy and DG. Consider 362-F: a skeptic might point
2 out that New Hampshire policymakers suggested limiting the amount of renewable
3 energy resources, given that there are set percentage of total requirements. Looking
4 closely at the language suggests differently, however: in section 362-F:3, it is clearly
5 stated that the percentage requirements are *minimum standards* (emphasis added), and
6 that the renewable resources may—and when read in the context of the purposes of these
7 statutes, *should*—exceed these minimum standards.

8 There is, however, one statute that suggests a limit on DG: RSA 374-G, *Electric Utility*
9 *Investment in Distributed Energy Resources*. In 374-G:4 II:

10
11 *“Distributed electric generation owned by or receiving investments from an*
12 *electric utility under this section shall be limited to a cumulative maximum in*
13 *megawatts of 6 percent of the utility's total distribution peak load in megawatts.”*
14

15 The current limit on net metering in the three investor-owned electric distribution
16 utilities' service territories (100 MW) is significantly less than the above 6% limit in 374-
17 G:4. Legislative history tells us that the 6% limit set in 374-G came from a concern to
18 maintain market competition in a restructured utility environment, rather than from a
19 desire to limit the amount of renewable energy resources. Under 374-G, incumbent
20 utilities can invest in and own generation capacity, up to a limit, in order to prevent one
21 party from dominating the distributed energy resources and/or the retail energy market.
22 Net metering is a policy tool that naturally encourages competition at the retail level. This
23 is because the classical conditions for markets are reasonably well met: full information,
24 relative ease of market entry and exit, and reasonable to no transaction costs. There are
25 many providers and investors able to “enter” the net metering market. Therefore a limit is

1 not justified under the pretense that net metering or net metering capacity levels could
2 limit market competition.

3 Technical limitations to DG naturally exist in our current system based on the hosting
4 capacity of a circuit, substation, or other technical aspects relating to the configuration of
5 the distribution system. As an industry rule of thumb, minimum load [on a circuit] is
6 typically twenty-five percent (25%) of peak load; this figure may be used to roughly
7 estimate the total DG hosting capacity on a given circuit. For each net metered DG
8 project above 100 kW, the distribution utility will determine the system impact of the
9 proposed project as part of the interconnection application process for the circuit in which
10 the project will interconnect. Hosting capacity can change over time depending on
11 investments made to the circuit.

12 At some level of DG penetration, a circuit will reach its capacity to host DG without
13 significant cost upgrades. In this case the owner/developer of the DG project would need
14 to pay for these cost upgrades; often these costs are significant enough that they make the
15 entire project uneconomic. At this point this circuit is essentially “capped.” The sum of
16 the limit of each circuit in the state is the “technical” cap. We acknowledge that the
17 current utility data may not exist to calculate the amount of this technical cap, as we have
18 learned from the limited data the utilities have regarding individual circuits, customer
19 usage, etc.

20 The intent of this docket is to examine relevant data and, from that data, determine a just
21 and reasonable net metering tariff. A just and reasonable net metering compensation rate
22 result implies that both utilities, customer-generators, and non-net metering customers are

1 appropriately charged and/or compensated. Higher penetration levels of DG, or better
2 utility and customer data, may result in new evidence in the future, but at this time the
3 evidence at hand does not warrant a limitation based on theories of unreasonable cost-
4 shifting or inappropriately set reimbursement rates.

5 There should not be a statewide limitation on the aggregate amount of capacity that can
6 net meter in New Hampshire, particularly not a limitation that is set at a level that is
7 arbitrary or a level that is out-of-step with regional net metering policies and reasonable
8 technical considerations. Therefore, NHSEA recommends that the aggregate amount of
9 net metered capacity be uncapped going forward. If, however, the Commission finds that
10 a cap is appropriate, the cap level should be set based upon sound technical data and
11 comparable policy practices used in our region. NHSEA also recommends that the
12 Commission continue to develop policies, utility data, and data management practices
13 and other research to best determine circuit level hosting capacity and ways to cost-
14 effectively increase such capacity, through its ongoing grid modernization proceeding
15 and implementation or through a dedicated technical working group. Lastly, although it
16 is our understanding that individual project size limits eligible to net meter is beyond the
17 scope of this proceeding, NHSEA's position is that the individual project size cap of one
18 (1) megawatt should also be increased.

19
20 **Q7. What is NHSEA's recommendation on future net metering tariffs?**
21
22

1 A7. NHSEA's experts demonstrated and concluded that the net benefits to all ratepayers are
2 significant and that there is no demonstrable nor unreasonable cost-shifting presently
3 attributable to net metering. Given the present evidence, and given the relatively low
4 levels of net metered DG penetration in New Hampshire at this time, NHSEA's position
5 on net metering tariffs that should be adopted after the 100 MW cap is reached, or at the
6 conclusion of this docket, is as follows:

7 **Residential/residential-scale:**

8 NHSEA recommends that the net metering reimbursement mechanism that is currently in
9 place for systems under 100 kW continue to be available for residential and residential-
10 scale (this may include small commercial, non-residential systems), with one
11 modification: the System Benefits Charge, the stranded cost recovery charge and the
12 electricity consumption tax all be removed from the reimbursement value for exported
13 energy. These bill components are not impacted by DG production and therefore is it
14 reasonable that the customer-generator would not get compensated for these amounts on
15 a kWh-basis for net exported production.

16 As penetration levels increase and the costs and benefits of DG change, NHSEA
17 recommends that the Commission, using a pre-determined methodology (such as the
18 Societal Cost test as described in Nathan Phelps' testimony), evaluate net metering when
19 aggregate DG penetration in NH reaches 5%, then again at 10%, and so on, to determine
20 the appropriate reimbursement rate.

21 Setting an arbitrary system size cut-off point will not promote maximum efficiencies in
22 system sizing and economies of scale: NHSEA recommends removing the arbitrary 100

1 kW demarcation going forward and base a net metering regime on well-defined project
2 sizes where economies of scale shift or on a customer-class basis.⁷

3 As James Bride describes in his testimony covering Renewable Energy Certificates
4 (“REC”), the Commission should also consider creating an optional “adder” for
5 residential net metered customers that would include a REC value through an aggregator
6 program offered by the utilities. This is described in more detail by Mr. Bride in his
7 testimony.

8 **Commercial/commercial-scale:**

9 For net metering customer-generators that currently fall in the larger bucket—systems
10 over 100 kW—NHSEA proposes a reimbursement level that includes compensation
11 beyond the default energy supply charge.

12 The basic formula for this type of commercial net metering tariff would look like the
13 following:

14
$$\text{Rate} = \text{Default Energy} + \text{Transmission} + \text{Distribution} + \text{Adders}$$

15 This type of reimbursement rate would be just and reasonable for commercial customer-
16 generators, who pay for nearly 40-50% of their utility bills in the form of demand-based
17 charges: the transmission and distribution portion of these customers’ bills are typically
18 very small on a per-kWh basis. Please refer to James Bride’s testimony for a review of
19 these rates.

⁷ If a bifurcation based on size remains, 250 kilowatts may be a more appropriate size based on economies of scale, existing regulations and on practices in surrounding states.

1 Including adders to compensate the customer-generator in order to share the benefits to
2 the electric system is just and reasonable because of the value delivered to the system and
3 other ratepayers. These adders include, but are not limited to:

- 4 1. Locational benefits adder (e.g. DG place on system to help relieve congestion)
- 5 2. Directional benefits (eg. west-facing solar systems) adder
- 6 3. Environmental benefits adder – to adequately value environmental attributes of DG,
7 eg. carbon accounting or otherwise.
- 8 4. Municipal or other public benefits adder
- 9 5. Peak demand time-of-use (TOU) adder (either additive to the 6-month averaged
10 default energy supply charge or as a replacement)
- 11 6. Brownfields/landfill/other non-greenfields adder (to encourage development on
12 otherwise unusable land or already developed land).
- 13 7. Storage or other ancillary services (e.g. voltage regulation) adder

14
15 NHSEA also recommends that the Commission consider employing an opt-in pilot Time-
16 of-Use (“TOU”) net metering rate, as described in testimony given by James Bride. As
17 our state and our utilities improve and modernize infrastructure that can harness and
18 benefit from transparent price signals and increased DG hosting capacity, a TOU
19 program such as the one Mr. Bride describes, can help to empower consumers so that
20 they can better respond to price signals and to employ their DG in ways to decrease
21 system-wide generation, transmission and distribution costs.

1 All net metering tariffs should be made available to all qualified renewable energy
2 resources, and eligible cogeneration systems, on a technology-blind basis. All net
3 metering tariffs, once adopted by the interconnected customer-generator, should be set
4 for a period of twenty-five years, and as penetration increases, reimbursements rates may
5 step down over time for a new customer-generator in its first year of operation.

6 As new evidence is introduced to the record, NHSEA reserves its right to recommend
7 and/or consider other options.

8
9
10 **Q8. Is there anything else you would like to add to the record?**

11
12 **A8.** Yes. The Legislature imparted a difficult but ultimately achievable task to the
13 Commission: to determine future net metering rates that are sustainable for the ratepayer,
14 the utility, and future customer-generators. To do this, we must balance costs with
15 benefits; simultaneously the contributions and payments to and from ratepayers must be
16 just and reasonable.

17 There is no proven harm to non-net metered ratepayers nor to the utilities themselves in
18 this docket to date; in fact, the evidence demonstrates that net metering provides net
19 benefits to all ratepayers. If there is a demonstrable loss in distribution base revenue to
20 the utilities, that can be addressed. Under the existing net metering statute, the utilities are
21 allowed already to recover lost revenues associated with net metering (RSA 362-A:9
22 (VII)). Given the multitude of benefits that are imparted to ratepayers through nearly all
23 components of the electric system, and therefore those reflected on the electric bill, it is

1 appropriate that all ratepayers would share in such a contribution, if needed, for the
2 recovery of those lost distribution utility revenues.

3 NHSEA is not opposed to a rate mechanism to recover lost distribution revenues but is
4 not proposing one because the utilities have not yet demonstrated in this proceeding
5 under a reasonable burden-of-persuasion standard that they are in fact losing revenues
6 attributable to net metering. In a past Commission proceeding, 15-137, NHSEA signed
7 on to the settlement agreement that included a Lost Revenue Adjustment Mechanism for
8 the utilities to recover proven and verifiable lost revenues that are attributable to energy
9 efficiency.

10 Net metering, as a policy tool, must be considered through a statewide lens, despite its
11 regional and societal impacts. Utilities, as state-regulated franchised monopolies, offer
12 the only opportunity – through the customer’s bill—for all customers to contribute to the
13 system-wide benefits they are all receiving. It is not merely a consideration of
14 distribution base costs and benefits. Utilities are unique in that they are the interface
15 between the electric grid and customers, and the Commission has regulatory authority
16 over them [as opposed to transmission and wholesale generation rates]. Given that net
17 metering is a retail product, it is reasonable to deploy system-wide benefits and costs
18 through the retail billing system.

19 Traditional utility rate-making and rate design is increasingly insufficient to meet the
20 evolving demands of customers, of public policy goals, and for the long-term financial
21 health of the utilities. Current rate design and metering infrastructure in New Hampshire
22 does not enable useable price signaling nor improved customer engagement. The utility

1 throughput incentive does not align with policy goals of decreased energy use nor with
2 the goal of lowering customer costs. These challenges are beyond the scope of this
3 proceeding, but nonetheless must be addressed and overcome. The Grid Modernization
4 efforts in IR 15-296 and the ongoing evolution of New Hampshire's Least Cost
5 Integrated Resource Planning process are the appropriate venues to address the
6 challenges we face. Much more utility data is needed to determine how or if we should
7 segment customer classes with greater granularity based on customer profiles, customer
8 cost-causation, or other factors. This proceeding is not the appropriate one, in time nor
9 scope, to address such pervasive and long-standing technical, regulatory, and economic
10 issues such as the aforementioned.

11
12 **Q9. Does this conclude your testimony?**

13
14 **A9. Yes.**