

**TOWN OF BELMONT, MA**

**TEMPORARY NET METERING WORKING GROUP REPORT**

**SEPTEMBER 29, 2015**

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## **I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS**

1. The Belmont Municipal Light Board (“Light Board”) appointed the Temporary Net Metering Working Advisory Group (“WG”) and stated its mission in a letter dated June 29, 2015 (attached as Appendix A). The WG was asked to evaluate and make recommendations regarding a policy and pricing structure for solar distributed generation to be used by Belmont Light (“BL”). The Light Board further stated that any recommended policies should not discourage the growth of solar power in Belmont and should be equitable for BL ratepayers. The WG was also asked to make recommendations on programs and initiatives that would assist BL in reducing carbon emissions.
2. The WG includes five Belmont residents. Three are full members and two are alternate members. The full members include Roy Epstein, Henry D. Jacoby, and Stephen Klionsky. The alternate members are Tony Barnes and Robert Gallant. At the first WG meeting on July 6, 2015, Roy Epstein was elected Chair, Steve Klionsky was elected Vice-Chair, and Henry Jacoby was elected Clerk. All five members participated in the discussions at the public meetings conducted to develop and analyze the information. All deliberations of the WG were conducted pursuant to the Massachusetts Open Meeting Law and the minutes of the meetings are available on the BL website.
3. The WG reviewed a large number of documents and a large amount of data in order to provide a factual basis for its recommendations. Each meeting of the WG included a period for public contributions. The meetings were well-attended and the WG appreciates the wide range of comments received from the public. The WG also thanks BL and the Belmont Town Clerk’s office for helpful information and valuable administrative support.
4. The WG regards the earlier community dialogue over a solar tariff for Belmont as informative but not determinative for its analysis. The WG instead has exercised its independent judgment in reaching recommendations that meet the twin goals of not discouraging adoption of solar distributed generation and equity for Belmont electricity

ratepayers as a whole. The WG also believes that a solar tariff should be easy for the general public to understand and simple for BL to administer.

5. This report recommends a solar tariff and certain programs that should be undertaken promptly in order to increase the number of solar hosts in Belmont. The WG believes that a separate report is warranted that more completely addresses the broader question of how BL can most effectively help reduce carbon emissions as well as utilize load management programs to conserve energy and reduce costs.
6. The WG's specific recommendations are as follows.

- a) Facility Solar Capacity Limit

The proposed tariff applies only to a solar interconnection where the facility has a capacity of 250 kW or less.

- b) Solar Tariff and Billing

- i. Each solar host shall pay for all electricity received from BL each month. The solar host shall pay the kWh rate and the monthly charge applicable to a comparable non-host customer.
- ii. Each solar host shall be paid a "buyback" price for all electricity delivered to BL each month. The buyback price from the effective date of this tariff through December 31, 2017 shall be \$0.11/kWh. Thereafter the buyback price shall be adjusted once annually using the method described in Section IV(A) below.
- iii. The amount due to the solar host for electricity delivered to BL each month shall be a credit towards the host's bill from BL for that month. If the resulting bill is negative, no payment shall be due to BL for that month and the negative amount will be applied as a credit towards the host's bill from BL for the next month.

c) Aggregate Solar Capacity Limit

- i. BL shall not process new applications after such time that the aggregate capacity of all solar distributed generation in Belmont receiving new metering or buyback services in addition to all applications previously submitted to BL under this tariff exceeds 1,000 kW (one megawatt).
- ii. In the event that the aggregate solar capacity limit in subsection (i) is reached, the Light Board will promptly assess any potential problems with further solar expansion. The Light Board may then increase this aggregate solar capacity limit in its discretion.

d) Compensation for Transition Away from Net Metering

The WG has two alternative recommendations to address possible compensation for transitioning away from net metering under the proposed tariff. The majority recommendation (from members Epstein and Jacoby) stems from observing that prospective hosts were informed as of November 2011 that net metering would be replaced and that the proposed tariff is more favorable than Phase II as announced at that time. The minority recommendation (from member Klionsky) does not distinguish between systems installed before or after November 2011.

Majority Recommendation

A residential account may request a one-time credit from BL to compensate for the transition from Phase 1 to the new tariff. Eligibility for such a credit shall be limited to residential accounts that entered into an interconnection agreement with BL before November 28, 2011, when the current Belmont solar tariff was announced. A request for such a credit should be made in writing to the Light Board within one year of the effective date of the recommended tariff.

An applicant for such a credit should demonstrate to the satisfaction of the Light Board that the out-of-pocket expense originally incurred to install the distributed

solar generation equipment will not be recovered within 15 years of the installation date under the terms of the recommended tariff. The Light Board may grant up to \$3,000 per eligible residential account in its discretion.

Minority Recommendation

Residential solar hosts with signed interconnection agreements before the effective date of the recommended tariff will continue to receive retail net metering for all electricity delivered to the Belmont Light distribution system for three years from the effective date of the recommended tariff. Thereafter the buyback terms for these hosts will be identical to those solar hosts with signed interconnection agreements under the recommended tariff.

e) Solarize Belmont Campaign

- i. In order to capitalize on existing credits for solar installation from the federal government that are not currently authorized after December 31, 2016, the Light Board is urged to organize a “Solarize Belmont” campaign immediately. The federal investment tax credit reduces the cost of a solar system to the solar host by up to 30 percent and provides a strong incentive for solar development.
- ii. It is recommended that the solarize campaign should involve BL and all interested citizen groups and residents. Retaining a consultant such as Sagewell, which has already done a good deal of work for BL in Belmont, is also recommended for receiving guidance in making a solarization campaign successful.

7. Other than as indicated in paragraph 6(d) above, the full members of the WG are unanimous in making the above recommendations.

8. Appendix B to this report is a preliminary draft tariff filing. The WG provides this draft in the hope that it will expedite preparation of final tariff language for filing with the Massachusetts Department of Public Utilities.
9. This report is accompanied by an Excel spreadsheet, described further below, used by the WG to analyze different tariff designs.
10. The remainder of this report explains the rationale for this price structure and the other recommendations in more detail.

## **II. BACKGROUND**

### **A. The Current Solar Tariff in Belmont**

11. The WG began by reviewing the current BL tariff for emission-free renewable energy facilities, which has been in effect since 2011. This tariff calls for a “Phase I,” which after no less than 12 months was to be followed by a “Phase II.” The WG understands that practical implementation of Phase II had to await installation of new customer meters. Since 2011 the majority of meters in Belmont have been upgraded but Phase I remains the current tariff for solar hosts. In both Phase I and Phase II, a solar host pays for all electricity received and BL pays the host for all electricity delivered back through the meter. A principal difference between the phases involves the buyback price.<sup>1</sup>
12. Under Phase I, the buyback price is the same as the “retail” kWh price paid by the host to BL.<sup>2</sup> The retail price covers the cost of power generation and transmission to Belmont, the cost of BL’s local distribution system, the charges for the 115kV substation currently under construction, and other expenses. Each kWh sold by the solar host therefore completely offsets a kWh purchased. This arrangement is known as “retail net metering.”
13. Under Phase II, the buyback price was instead a “wholesale” price. The Phase II price stated in the current tariff, which was not implemented, is the Real Time Locational

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<sup>1</sup> For purposes of this report, all prices (\$/kWh) are exclusive of any monthly fixed charges.

<sup>2</sup> Belmont Municipal Light Department Net Metering and Buyback Tariff for Emission-Free Renewable Generating Facilities Serving Customer Load, section 1.05.

Marginal Price (“RT-LMP”) reported by ISO-New England).<sup>3</sup> Compared to the Phase I retail price (currently approximately \$0.198/kWh), the Phase II wholesale price in 2014 (the latest full year available) would have averaged approximately \$0.065/kWh.

14. The WG notes that the 2011 tariff was explicit in presenting Phase I as a temporary measure. The WG also notes that the majority of solar hosts in Belmont installed their equipment after the 2011 tariff was announced.

**B. Community Dialogue: July 2014–April 2015**

15. The proposed transition away from Phase I generated prolonged discussion in Belmont that the WG will not attempt to chronicle. In July 2014 Sustainable Belmont (“SB”) commented on Phase II and also on a “Phase III” that was under development by the Municipal Light Advisory Board (“MLAB”).<sup>4</sup> Suffice it to say that a vigorous debate emerged over these issues. The WG appreciates the enormous efforts by BL, MLAB, SB, the Municipal Light Board, and other concerned citizens over the winter of 2014–15 to agree upon a solar tariff for the long term. However, no agreement was reached. The policy approved by MLAB and the Light Board in November 2014 contained elements from both Phase II and Phase III but, like the original Phase II, was not put into effect.
16. The WG has considered action recommended in the July 2014 SB comments. One of the SB recommendations was that the Light Board “evaluate a tariff design similar to those adopted by Groton and Concord.”<sup>5</sup> Groton and Concord are two other municipal electric systems in Massachusetts.
17. The WG investigated and found that Groton utilizes a structure similar to Phase II. Specifically, the Groton tariff states: “Solar Rate Accounts receive a credit for generation returned to the power grid. The credit is based on the monthly average on-peak locational

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<sup>3</sup> Belmont Municipal Light Department Net Metering and Buyback Tariff for Emission-Free Renewable Generating Facilities Serving Customer Load, section 1.07.

<sup>4</sup> Comments on Belmont Light’s/MLAB’s Current and Proposed Renewable Energy Net Metering/Buyback Tariffs, Sustainable Belmont’s Energy Working Group, July 31, 2014.

<sup>5</sup> *Ibid.*, p. 3.

marginal price as published by the Independent System Operator of New England (ISO-NE).”<sup>6</sup> Groton Electric Light has confirmed that they have never used a retail buyback price.

18. The WG also investigated the Concord design. Concord is related to Phase I but with two major differences. First, each solar host also pays a monthly “Distribution Charge” based on the kW capacity of the solar array (in addition to the fixed charges any comparable customer without solar would pay). The Distribution Charge starts at \$3.60 per month for systems between 2 and 4 kW, rises to \$6.60 per month for systems between 4 and 7 kW, and thereafter increases by \$3.60 per month for every 3 kW block above 7 kW (e.g., an 11 kW system would pay \$13.80 per month). Second, each kWh delivered by the solar host in a given month offsets the cost of a kWh purchased that month. If the total kWh delivered by a solar host in a given month exceeds the kWh received, however, the buyback price for any “excess” kWh in that month is set at a locational marginal price published by ISO-NE.<sup>7</sup> For example, suppose a Concord host with a 5 kW system (similar to the Belmont average) over the course of a month receives a total of 500 kWh and delivers 600 kWh. The Concord host would pay a \$6.60 Distribution Charge and would receive a credit for 100 kWh valued at the chosen LMP, not the retail price. In 2014, the LMP paid to solar hosts in Concord was approximately \$0.052/kWh.<sup>8</sup>

### C. The May 2015 “Term Sheet”

19. A different proposal that has come to be known as the “Term Sheet” was put forward by a group of Belmont residents in May 2015 after discussion with members of MLAB and the Light Board.<sup>9</sup> The Term Sheet contains five provisions summarized as follows:

- a) Buyback price for new solar hosts. Full retail rate minus the BL distribution rate.

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<sup>6</sup> The Groton residential solar tariff is available online at <http://www.grotonelectric.org/rates/solar-rates/>.

<sup>7</sup> The Groton residential solar tariff is available online at [http://www.concordma.gov/pages/concordma\\_lightplant/new%20rate%20files/A11%20Rate%20R-6%20Net%20Metering%2005\\_01\\_2015.pdf](http://www.concordma.gov/pages/concordma_lightplant/new%20rate%20files/A11%20Rate%20R-6%20Net%20Metering%2005_01_2015.pdf).

<sup>8</sup> 2014 Return of the Municipal Light Department of the Town of Concord, MA to the Massachusetts Dept. of Public Utilities, p. 22.

<sup>9</sup> Term Sheet. The WG also reviewed a memorandum on the Term Sheet prepared by Synapse Energy Economics, Inc., a consulting firm retained by Belmont resident Claus Becker on behalf of Belmont Clean Energy.

- b) No Fixed Fees. No fees or charges specific to emission free renewable (“EFR”) production or EFR hosts.
- c) Buyback price for existing solar hosts. Phase I for another 10 years.
- d) Host capacity limit. Residential host systems no larger than 10 kW.
- e) Aggregate Production Limit. Total Belmont EFR capacity limited to three percent of BL historical energy consumption.

20. The WG discussed the Term Sheet during its July 16, 2015 meeting. The WG has a number of concerns with this proposal. The proposed buyback price implicitly included the amount charged by BL to residential accounts to cover the cost of debt service for the 115 kV transmission line and associated substation now under construction. The WG does not see a reason to include the debt service component of rates in the credit to solar hosts. The WG is not recommending a periodic fixed fee as part of the proposed tariff and believes that any administrative charges specific to solar hosts should be reasonable and cost-based. The WG also believes the proposed ten year grandfathering of Phase I for existing hosts in the Term Sheet is far too long and thus unwarranted. In addition, the WG recommends different limits on host capacity and the total amount of solar in Belmont.

### **III. SOLAR TARIFF PRINCIPLES AND RECOMMENDED DESIGN**

#### **A. Overview**

21. The WG analyzed three alternative solar tariff designs. The three tariff designs are named for convenience “Net Metering,” “Grid I/O,” and “Austin.” Each alternative was evaluated in terms of the projected rate of return and payback period for the solar investment by the host and also in terms of the financial effect of the investment on BL. The WG developed a detailed spreadsheet model for this purpose that accompanies this report.

22. In Net Metering the solar host pays a fixed monthly distribution charge (which may be zero). In addition, for each billing period, the kWh delivered by the solar host is subtracted

from kWh received by the host to yield net kWh. If the net kWh is positive, the host pays the net kWh times the retail delivered price (i.e., the delivered kWh offset the same number of kWh received). If the net kWh is negative, the host receives a credit equal to the net kWh times the buyback price (i.e., “excess” kWh are valued at the buyback price). The user specifies all prices and charges for the analysis. Setting the distribution charge to zero and setting the buyback price to the retail price is equivalent to Belmont Phase I.

23. Grid I/O is different. It charges the host the retail price for all kWh received from BL and credits the host a buyback price for all kWh delivered to BL. The general design is therefore similar to Groton as well as Phase II. The retail and buyback prices are inputs selected by the user.
24. Austin is a third design (used by the municipal power company in Austin, TX) that is described in an article by an author recommended to the WG by a member of SB.<sup>10</sup> For each billing period, the host is charged for all electricity consumed as if the customer had no solar generation. The host then receives a credit at a buyback price for total kWh generated during the billing period, regardless of whether the energy is consumed on-site or delivered to a third-party.
25. For each design, the WG model considers such factors as the size and cost of a solar array, the buyback price, other financial support for solar hosts including federal and state tax credits and solar renewable energy certificates (“SRECs”), the amount of electricity sold and consumed by the host, and BL’s cost of power and local distribution expenses. This information is sufficient to generate expected cash flows and rate of return for the host and to calculate the financial impact on BL.
26. It was not feasible for the WG to carry out an independent study of what has been called the “value of solar.” However, the WG did review several existing studies that estimate the value of such factors as avoided transmission and capacity costs and

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<sup>10</sup> Karl R. Rábago et al., “Designing Austin Energy’s Solar Tariff Using a Distributed PV Value Calculator.”

environmental benefits such as reduced CO<sub>2</sub> and other pollutants.<sup>11</sup> As will be explained below, the recommended tariff pays the solar host the approximate transmission and capacity costs avoided by BL. In addition, the SREC is paid for every kWh generated, regardless of whether it is consumed on site or exported. The SREC value is currently in excess of \$0.20/kWh, which exceeds the environmental value of solar in the studies reviewed.

#### **B. Balancing the Interests of Solar Hosts, BL, and Belmont as a Whole**

27. A private investment in a solar distributed generation facility is economically worthwhile if the expected monetary return covers the financing costs. The WG found that current interest rates on home equity loans at Belmont Savings Bank and other local banks range up to nearly 8%. The WG therefore assessed whether a particular solar tariff using one of the designs implied an internal rate of return of 8% or more. This means that a solar host could borrow the full amount of the installation cost and earn enough to repay the loan with interest.
28. The impact on BL requires a short discussion of “cross-subsidies.” The WG does not regard the debate over this question in the past year as productive. Instead, the WG believes it is more important to consider the “contribution margin” from the solar host. The contribution margin measures how much the solar host pays towards BL’s fixed costs after the incremental costs for supplying power to the host are covered.<sup>12</sup> BL has fixed operating costs of running the local distribution system and administration that are incurred regardless of how much power is sold. In 2014 the operating costs were approximately \$5.6 million.<sup>13</sup> In addition, BL incurs debt service of approximately \$1.95 million annually for the new 115 kV substation and associated transmission lines.
29. For purposes of this report, a cross-subsidy will be defined as a situation where the contribution margin earned from a solar host is negative, i.e., BL’s cost of supplying power

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<sup>11</sup> See, e.g., Acadia Center, “Value of Distributed Generation,” April 2015.

<sup>12</sup> Contribution margin is explained in many books on cost accounting, e.g., Charles T. Horngren et al., *Cost Accounting* 10<sup>th</sup> edition, Prentice-Hall, 2003, p. 63.

<sup>13</sup> Belmont Light 2014 Report to the Massachusetts Dept. of Public Utilities, p. 42.

to the host for a month is greater than the monthly revenue received from the host. The WG analysis indicates that the recommended tariff is unlikely to generate a cross-subsidy in this sense. Nonetheless, the contribution margin from a solar host is generally less than the margin from a comparable non-solar account. For reasons of equity, the WG considers it appropriate for a solar host to pay as much towards local fixed costs as a comparable non-solar account, tempered by the goal of not discouraging the financial incentive to invest in a solar facility.

30. Every BL customer requires distribution services which involve costs. The situation is no different for a solar host because access to the grid is needed during nighttime and bad weather and during the daytime when the host's demand exceeds its own generation capacity. The host also needs the local distribution system to sell power back. BL has estimated that the average Belmont solar host "exports" about 58% of its generation.<sup>14</sup> The WG model indicates that these exports even lead to greater utilization of the local grid by solar hosts compared to other customers. An independent study cited in the July 2014 SB comments discusses that "the customer has built a system that requires a grid in order for all of the power to be used, and should contribute to the cost of the grid for both uses."<sup>15</sup>
31. Local distribution in Belmont is a community asset. Paying for those fixed costs is incumbent on every BL customer regardless of the amount of power demanded, the level of energy conservation, or the amount of renewable energy generated.

### **C. Recommended Design**

32. After extensive investigation of the three alternative designs, the WG recommends Grid I/O. This design is simple and can be readily implemented with the new smart meters that have been installed in Belmont. The solar host pays the retail price for all kWh received from BL and is credited at a buyback price for all kWh delivered to BL. This structure is

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<sup>14</sup> Belmont Light, Proposed fixed charge for recovery of costs from residential solar PV distributed generation, October 29, 2014, p. 2.

<sup>15</sup> Carl Linvill et al., "Designing Distributed Generation Tariffs Well," Regulatory Assistance Project, November 2013, p. 38.

similar to Groton, Phase II, and other municipal systems in Massachusetts, as well as the proposal for new hosts in the Term Sheet.

33. The WG model indicates the Grid I/O model will provide a reasonable rate of return and margin contribution for solar hosts ranging in size from small residential to large commercial installations. In other words, it is automatically scalable. Scalability is important because the Massachusetts data show a significant increase in average residential array size over past 3 years.
34. In contrast, while the Net Metering design generally offers an adequate rate of return to the host, it requires substantial fixed charges to balance the goal of contribution margin. The indicated fixed charge also increases as the system becomes larger. The WG is concerned about the complexity of a tariff with many tiers of fixed charges. The fixed charges arise to make Net Metering scalable and, in the WG's view, a workable Net Metering design largely mimics the recommended Grid I/O approach without offering additional advantages.
35. The WG appreciates the desirable theoretical properties of the Austin design but believes it has decisive drawbacks for Belmont. As a practical matter, it cannot be implemented with Belmont's new smart meters because those meters do not record the kWh generated by the host. It requires a complex and perhaps time-consuming process to determine the buyback price, and may deter solar installations merely because it is unfamiliar in Massachusetts.

#### **IV. THE RECOMMENDED BUYBACK PRICE**

##### **A. Buyback Rate Formula and Updating**

36. The WG recommends the buyback price be set at \$0.11/kWh for billing periods ending on or before December 31, 2017.
37. For billing periods ending on or after January 1, 2018 the WG recommends using a buyback price adjusted to reflect average changes in the market price paid by BL for

generation since December 1, 2014 (the last full year preceding implementation of the recommended tariff). The recommended procedure is to calculate a new buyback price each December, starting in December 2017, using the generation charge in effect on that December 1, and to use the new price for the next calendar year. For example, the price calculated in December 2017 would apply for all of 2018, the new price calculated in December 2018 would apply for all of 2019, and so forth.

38. The recommended buyback price (\$/kWh) in a given year after 2017 would be the sum of \$0.02061 plus the Department's Residential Rate A Generation charge in effect in on the first day of December, with the result rounded to the nearest whole cent. The \$0.02061 equals \$0.11 minus the December 2014 Residential Rate A generation charge of \$0.08939. This procedure ensures that the initial \$0.11/kWh buyback price is adjusted appropriately.
39. To illustrate, suppose the Residential Rate A Generation charge on December 1, 2017 was \$0.09939/kWh (i.e., \$0.01/kWh higher than the Residential Rate A Generation charge in December 2014). The recommended buyback price for all of 2018 would be \$0.12 (calculated as 0.02061 plus 0.09939, rounded to the nearest cent), or \$0.01 higher.
40. The recommended buyback price, in the view of the WG, is a reasonable estimate of the avoided cost of generation, capacity, and transmission for BL based on the amounts actually charged for these components. The price tracks changes in market rates for generation and capacity in a manner that is reasonable in the circumstances. There are subtleties and indeed some uncertainty in determining exact avoided generation and capacity expenses but the WG does not consider it necessary to analyze all such questions in detail for its purposes.
41. The recommended buyback rate is considerably higher than the LMP-based prices used by Groton and Concord and contemplated in Phase II. This is due largely to incorporation of transmission and capacity charges that are separate from LMP.

## B. Supporting Analysis from the WG Model

### 1. Rate of Return for Solar Investment

42. The WG has analyzed a variety of scenarios that indicate the recommended tariff will yield a sufficient rate of return. The starting point is a new “average” solar host in that the system is assumed to be the current median residential size in Belmont (5.06 kW), with average total annual electricity consumption (7,289 kWh). The assumed purchase price for the host is \$3.65/W and the host qualifies for the 30% Federal investment tax credit and the \$1,000 Massachusetts tax credit.<sup>16</sup> The buyback price is assumed to be \$0.11/kWh and is assumed to grow at 2% annually.<sup>17</sup>
43. The major remaining assumptions involve annual SREC values over the next 10 years, which is the horizon available for a new solar host in Massachusetts. SRECs are quite valuable and have a large impact on the investment return. The model considers both a “low” SREC scenario, which starts at \$0.224/kWh in the first year and then declines, and a “high” scenario, which starts at \$0.275/kWh and then declines.<sup>18</sup> For example, the solar host earns \$0.224/kWh in the first year of the low scenario for all distributed generation, in addition to any buyback payment by BL.
44. On this basis, and relying on a number of less important assumptions built into the model, the “average” host has an after-tax installed cost of approximately \$12,000. The resulting cash flows imply internal rates of return of 13.3% (low SREC) and 15.7% (high SREC). These returns indicate to the WG that there would be a sufficient economic incentive for the host to undertake the project.

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<sup>16</sup> The WG has been informed by Sagewell, a consultant retained by BL, that \$3.65/W is a realistic price for new installations as of summer 2015.

<sup>17</sup> This assumption about inflation is the same as in the pro forma rate of return analysis distributed by Selectman Jim Williams during a June meeting of the Light Board.

<sup>18</sup> The low and high SREC scenarios in the WG analysis are taken from the Jim Williams pro forma but reduced by 7% to reflect assumed brokerage fees. The WG has not considered potential taxability of SRECs for several reasons: there is no IRS guidance on the issue; if an SREC is viewed as business income then it seems that the host could also claim depreciation and reduce the tax liability; and accounting discussions are unclear whether the SREC is income or a return of capital.

45. The WG used the model to “stress test” this conclusion in a variety of ways. Examples of the scenarios considered include a hypothetical solar host with a) significantly worse panel performance (due perhaps to orientation or tree shading); b) significantly smaller than average array size (in kW); and c) significantly larger than average array size. These experiments and others give the WG confidence that the proposed tariff will create a sufficient economic incentive to invest in solar for hosts who are interested in the option and have a suitable location from a technical point of view.

## **2. Contribution Margin**

46. The WG also analyzed the contribution margin for BL in the different experiments using the recommended Grid I/O design. The results indicate reasonable margin from the hosts.

## **3. Conclusions about Reasonableness of the Recommended Tariff**

47. These experiments and others give the WG confidence that the proposed tariff will not discourage the growth of solar power in Belmont and will be equitable for BL ratepayers.

48. As an alternative to direct purchase, a solar host may have the option of a third-party contract, acquiring the solar energy through a lease or a power purchase agreement (PPA).<sup>19</sup> These agreements have helped expand the solar market in the states where it is allowed, because many third-party deals are available at zero out-of-pocket cost to the host. Third-party suppliers are well positioned to take advantage of the SRECs, and in addition to the investment tax credit they can benefit from the Modified Accelerated Depreciation System (MACRS).<sup>20</sup> While the WG did not model the many potential PPA and lease arrangements explicitly, the WG expects that, when the private purchase option is economically worthwhile, developers will be able to offer contract terms that are attractive to solar hosts.

49. The WG notes that the initial recommended buyback price is similar to the price proposed in the Term Sheet for new hosts. The WG did not receive any public comment or

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<sup>19</sup> See, e.g., <http://www.solarcity.com/residential/affordable-solar-lease>; <http://www.solarflair.com/about/faqs#6>.

<sup>20</sup> A comparison of direct purchase and third party systems is provided by MIT Energy Initiative, *The Future of Solar Energy*, 2015 (<http://mitei.mit.edu/futureofsolar>).

see any evidence to demonstrate that the recommended buyback price would impede additional solar installations.

## **V. OTHER RECOMMENDATIONS**

### **A. Capacity Limits**

50. The WG recommends that this tariff apply only to solar interconnections with a capacity of 250 kW or less. This is sufficient to cover the existing solar hosts and likely new residential, commercial, and municipal applications. If a developer is interested in building a larger solar facility in Belmont, i.e., “industrial” or “utility” scale, this may raise new economic and technical issues that would best be addressed on a case by case basis.
51. The WG recommends an initial cap of 1,000 kW of total solar capacity in Belmont interconnected with BL. To put this in context, Belmont currently has approximately 280 kW of interconnected solar. The intent is to require the Light Board to review the recommended tariff for any problems upon reaching the cap. If no problems are identified, the WG expects the Light Board will then raise the cap promptly to a suitably higher level and allow additional solar installations.

### **B. Transition Credit**

52. The WG has two alternative recommendations to address possible compensation for ending net metering under the proposed tariff.
53. The majority recommendation (from members Epstein and Jacoby) is that a residential account may request a one-time credit from BL to compensate for the transition from Phase 1 to the new tariff. Eligibility for such a credit shall be limited to residential accounts that entered into an interconnection agreement with BL before November 28, 2011, when the current Belmont solar tariff was announced. A request for such a credit should be made in writing to the Light Board within one year of the effective date of the recommended tariff.
54. Furthermore, an applicant for such a credit should demonstrate to the satisfaction of the Light Board (or its designees) that the out-of-pocket expense originally incurred to

install the distributed solar generation equipment will not be recovered within 15 years of the installation date under the terms of the recommended tariff. The Light Board may grant up to \$3,000 per eligible residential account in its discretion.

55. The majority recommendation stems from observing that prospective hosts were informed as of November 2011 that net metering would be replaced and that the proposed tariff is more favorable than Phase II as announced at that time. The WG is aware of five residential solar systems in Belmont that predate November 2011. The majority recommendation is intended to provide relief to eligible hosts for whom the return on the solar investment would be less than the long-term interest rate prevailing at the time the investment was made.
56. The minority Recommendation (from member Klionsky) is that solar hosts with signed interconnection agreements before the effective date of the new tariff will continue to receive retail net metering for all electricity delivered to the Belmont Light distribution system for three years from the effective date of the recommended tariff. Thereafter these hosts will be billed per the recommended tariff.
57. This recommendation to grandfather all existing solar hosts smaller than 100 kW for a period is based on equity and avoiding complexity. Existing solar hosts installed their systems at a time when solar installations were more expensive than at present, and installed them at a time of considerable uncertainty as to Belmont Light's policy (the 2011 tariff set out a transition period but that period came and went without the stated transition). In addition, given the small number of existing solar hosts, the financial impact of a three-year grandfathering is insignificant. The minority recommendation also avoids the complexity of investigating any individual host's out-of-pocket expenses, and avoids the potential of having to pay out an aggregate of \$15,000 to the hosts identified in the majority recommendation.

### **C. Solarize Belmont Campaign**

58. It is essential to implement a Solarize Belmont campaign as soon as possible. The success of such campaigns in attracting new solar hosts has been proven in many towns in Massachusetts, including Concord, Arlington, Woburn, Wellesley, and others. A solarize campaign offer an installer a large block of business from new hosts in return for competitive pricing. It is akin to a group buying program. The potential for large discounts arises because marketing costs are significant for an installer. When the campaign is able to promise a block of customers, the installer is able to save marketing costs and offer lower prices. The time urgency is due to the fact that the federal income tax credit for solar is scheduled to expire at the end of 2016. It makes sense to help potential hosts take advantage of this financial benefit now.
59. Solarize campaigns are effective in persuading many remaining potential solar hosts in a town to make the commitment to acquiring a system. The 2013 Solarize Concord campaign, for example, attracted approximately 155 new hosts and the installation prices were much lower than in earlier years. In contrast, there were no more than 20 new hosts in Concord in any other year before or after. The pattern is similar in other Massachusetts towns examined by the WG.
60. The WG urges the Light Board to work with BL and all interested citizen groups and residents to enlist their support in organizing and implementing a Solarize Belmont campaign. This should commence as soon as possible. A consultant such as Sagewell, which has already done a good deal of work for BL in Belmont, can also provide valuable guidance and resources in making a solarization campaign successful.

### **D. A Broader Renewable Energy Policy**

61. A portion of the charge from the Light Board was to “make recommendations on programs and initiatives that would assist Belmont Light in reducing carbon emissions.” It would be appropriate for a larger and more permanent group, perhaps Belmont’s Energy Committee, in conjunction with BL, MLAB, and other resident groups, to work on specific

programs and initiatives that Belmont Light could implement in the near and long-term. As one example, it may be worthwhile to redesign the existing Green Choice program.

62. To provide a framework to guide further decisions by the town with regard to renewable energy, it would be useful to update and expand the existing Energy Resource Policy. The WG has reviewed a plan from Concord, MA and believes that developing a comparably detailed strategy for Belmont should be a priority.<sup>21</sup>

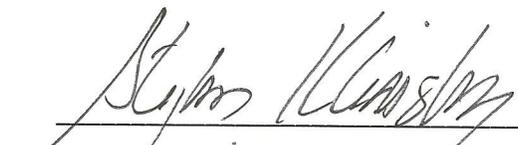
63. Open dialog and transparency was an essential part of the work of the WG. We encourage maintaining a strong focus on communicating complex issues like tariff structure and grid maintenance in clear and understandable terms to increase public understanding and ability to participate intelligently.

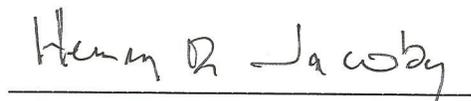
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<sup>21</sup> The Concord report is available at [http://www.concordma.gov/pages/concordma\\_lightplant/board](http://www.concordma.gov/pages/concordma_lightplant/board).

Respectfully submitted on September 29, 2015.

  
Roy Epstein, Chair

  
Stephen Klionsky, Vice-Chair

  
Henry D. Jacoby, Clerk

**APPENDIX A**

**Charge from Municipal Light Board**

June 29, 2015

Dear Working Group Members,

Congratulations on your appointments to the Temporary Net Metering Working Advisory Group. We look forward to collaborating with you as you review Belmont Light's net metering policy and advise on carbon emission reduction programs. These topics are very important to the community, so we are pleased to have esteemed volunteers like yourselves addressing them.

Below please find the charge for your working group, along with email addresses for all members. Though the official term of the working group lasts 60 days, we hope that you will present the Municipal Light Board with draft recommendations by the end of July. Please feel free to assemble and commence work as soon as is convenient for you after you have all been sworn in by the Town Clerk.

**Charge for the Belmont Temporary Net Metering Working Advisory Group**

Under the direction of the Belmont Municipal Light Board, this temporary working group will evaluate and make recommendations on Belmont Light's policy and pricing structure for solar distributed generation. Members will be asked to suggest a policy and pricing solution that will not discourage a growth of solar power in Belmont and that is equitable for Belmont Light ratepayers. The working group shall also make recommendations on programs and initiatives that would assist Belmont Light in reducing carbon emissions. It is hoped that recommendations will be presented to the Municipal Light Board by August 15, 2015.

**Working Advisory Group Members**

Roy Epstein, Member, [rje@royepstein.com](mailto:rje@royepstein.com)  
Henry Jacoby, Member, [hjacoby@mit.edu](mailto:hjacoby@mit.edu)  
Steve Klionsky, Member, [klsky@aol.com](mailto:klsky@aol.com)  
Tony Barnes, Alternate Member, [tony@energysavvy.com](mailto:tony@energysavvy.com)  
Robert Gallant, Alternate Member, [rmbhg@verizon.net](mailto:rmbhg@verizon.net)

Thank you for your service.

Sincerely,

Sami Baghdady  
Chairman, Municipal Light Board

cc: MLB Vice Chairman Paolillo, MLB Member Williams, Belmont Town Clerk's Office, Belmont Town Administrator's Office, Belmont Light General Manager Palmer

**APPENDIX B**  
**Draft Solar Tariff**

**BELMONT LIGHT  
TARIFF FOR EMISSION-FREE RENEWABLE GENERATING FACILITIES SERVING  
CUSTOMER LOAD**

Applicability

1. A Program for Extending Credits for Excess Production from an Emission-Free Renewable Facility (“EFR Facility”). The Belmont Municipal Light Department (the “Department”) sets forth in this tariff a program for the extension of credits for excess generation from an EFR Facility installed at the premises of a Host Customer, as defined below.
2. Available Tariffs and Minimum Charges for Service from the Department. A Host Customer may receive service from the Department under any tariff of the Department open to the Host Customer (the “Applicable Customer Tariff”). Host Customers without demand meters shall be responsible for the Customer Charge, and Host Customers with demand meters shall be responsible for the both the Customer Charge and the Demand Charges only under the applicable tariff.
3. Buyback Credit and Charges. The total generation of the EFR Facility which is fed back into the system of the Department shall be the basis for a Buyback Credit as set forth in Section 1.05, below.
4. Host Customer Options. Host Customers who receive buyback services under this tariff may own, lease or enter into retail purchase agreements with owners or operators of, an EFR Facility which meets the requirements of this tariff. Ownership, lease and retail purchase arrangements of Host Customers shall be entered into at the sole risk of the Host Customers who will be responsible for the terms and conditions of any such arrangement. This tariff specifically contemplates retail purchase agreements only in the limited cases of Solar EFR Facilities. Other types of distributed generation facilities, except for existing distributed generators as of the effective date of this tariff as set forth in Applicability (2), above, shall not be entitled to services under this tariff. Sales by owners or operators of other types of distributed generation facilities to customers of the Department are not permitted in the service territory of the Department.
5. No Access to the Department’s System. Other than buyback service under this tariff, this tariff does not entitle the Host Customer or any different owner or operator of the EFR Facility, as the case may be, to have access to the lines, wires or any other facilities of the Department for any other purpose, including, without limitation, for the purpose of making retail or wholesale sales to any other person or entity with the use of such lines, wires or other facilities of the Department.
6. Limitations on the Allocation of Credits. Only the accounts of the Host Customer (and if applicable, any tenants of Host Customer) at the premises where the EFR Facility is located shall be eligible to receive a Buyback Credit during the applicable periods. No other accounts of the Host Customer, nor any accounts of any other customer of the Department, nor any other person or entity, shall be allocated any portion of the Host Customer’s applicable credits.
7. No Aggregation of Customers or Accounts Receiving Behind-the-Meter Service from an EFR Facility. An EFR Facility may provide electricity for the end use of only the Host Customer

**BELMONT LIGHT  
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(and/or the tenants of Host Customer) under the accounts of the Host Customer (and/or the tenants of Host Customer) at the premises where the EFR Facility is located. No other account of the Host Customer or any account of any other customer of the Department, nor any other person or entity, may receive electricity for end use or for resale from an EFR Facility subject to this tariff.

8. Other Terms and Conditions. Service under this tariff is also subject to the Department's printed requirements and the Department's Terms and Conditions – Distribution Service, each as in effect from time to time.

Section 1.01 Definitions

The terms set forth below shall be defined as follows, unless the context otherwise requires.

Applicable Customer Tariff means any tariff of the Department, as may be selected by the Host Customer, under which the Host Customer is entitled to receive electric service from the Department.

Billing Period means the period of time set forth in the Department's terms and conditions for which the Department bills a Customer for its electricity consumed or estimated to have been consumed.

Buyback Credit is the amount credited to the bill of a Host Customer in accordance with the terms of this tariff for a Billing Period for the Buyback kilowatt-hours ("kWh"), calculated as set forth in Section 1.05 of this tariff.

Buyback kWh means the kWh of electricity generated by the EFR Facility which is fed from the EFR Facility into the system of the Department in an applicable Billing Period.

Buyback Metering means the process of the Department, in accordance with the terms of this tariff, of measuring for any given Billing Period, (a) the electricity generated by the EFR Facility and fed into the system of the Department and (b) the total electricity delivered by the Department to the Host Customer.

Buyback Price means the price used in conjunction with the Buyback kWh to calculate the Buyback Credit.

Buyback Services means the process of the Department, in accordance with the terms of this tariff, of differentiating, with the use of Buyback Metering, between (a) the electricity delivered by the Department to the Host Customer which is billable to the Host Customer under the Applicable Customer Tariff and (b) the electricity generated by the EFR Facility and fed back into the system of the Department, which results in the Buyback Credit calculated pursuant to this tariff and credited on the bill of the Host Customer.

**BELMONT LIGHT  
TARIFF FOR EMISSION-FREE RENEWABLE GENERATING FACILITIES SERVING  
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Customer means any person, partnership, corporation, or any other entity, whether public or private, who obtains distribution service at a customer delivery point and who is either an existing or a new customer of record of the Department for its own electricity consumption.

EFR Facility means a plant or equipment located on the premises where a Host Customer takes electric service from the Department (i) that is used to produce, manufacture, or otherwise generate electricity on the Host Customer's side of the meter for the consumption of the Host Customer at the premises and for injection into the system of the Department and for no other purposes; (ii) that is not a transmission facility; (iii) that is a Solar EFR Facility; (iv) that when interconnected to the system of the Department pursuant to the Interconnection Standards of the Department, results in an aggregate capacity for all EFR Facilities so interconnected no greater than the EFR Facilities Aggregate Capacity Limit; and (v) has a capacity rating of 250 kW or less.

EFR Facilities Aggregate Capacity Limit means the aggregate capacity limit of all EFR Facilities interconnected to the system of the Department pursuant to the Interconnection Standards and receiving buyback services under this tariff, as such limit shall be set forth by the Department from time to time pursuant to Section 1.06 of this tariff.

Host Customer means a Customer with an EFR Facility that generates electricity on the Customer's side of the meter, provided, however, a customer of the Department as of the effective date of this tariff with a net metered distributed generation facility shall be considered a Host Customer hereunder without regard to fuel source. Haven't defined 'net metered.' Do we need the last clause?

Interconnection Standards means the Department's standards and/or guidelines for the interconnection of distributed generation to the system of the Department as set forth from time to time in its public policies or filed tariffs, as the case may be.

Solar EFR Facility means a facility for the production of electrical energy that uses sunlight to generate electricity, is interconnected to the system of the Department pursuant to the Interconnection Standards, and meets all requirements of an EFR Facility under this tariff.

Section 1.02 Interconnection

Interconnection of EFR Facilities is governed by the terms of the Department's Interconnection Standards and sets forth the following information for buyback services:

- (a) Application procedures;
- (b) Information necessary for requests;
- (c) Metering and technical requirements; and
- (d) Termination and suspension provisions.

**BELMONT LIGHT  
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The Host Customer at any time may indicate its request for Buyback Services on its application pursuant to the Interconnection Standards.

Section 1.03 Metering and Reporting of Generation

1. As indicated in Applicability (2), the existing Host Customer's meter must be able to record or calculate for each month (a) the electricity generated by the EFR Facility and injected into the system of the Department, and (b) total electricity delivered by the Department to the Host Customer. The Host Customer's meter must also be in compliance with all other metering requirements and policies of the Department in effect at the time. If the Host Customer's meter does not meet the above requirements, the Department shall install, at the expense of the Host Customer, metering of a type chosen by the Department; either installed by the Department or by a contractor approved by the Department; and paid for by the Host Customer, either in a lump sum or over time as the Department may reasonably determine.

Section 1.04 Buyback: Billing for Deliveries under the Applicable Customer Tariff and Administration of Buyback Credits

1. The Department shall bill a Host Customer under the Applicable Customer Tariff for all electricity delivered by the Department to a Host Customer for any Billing Period.
2. The Department shall calculate a Buyback Credit as set forth in Section 1.05 below, and provide the Buyback Credit only to the Host Customer's applicable account for each Billing Period for the electricity generated by the EFR Facility and fed into the system of the Department, if any.

Section 1.05 Calculation of the Buyback Credit

1. For an EFR Facility, the Department shall calculate for each applicable Billing Period a Buyback Credit equal to the product of the Buyback kWh and the Buyback Price.
2. For Billing Periods ending on December 31, 2017 or before, the Buyback Price shall be \$0.11 per kWh.
3. For Billing Periods ending in the period January 1, 2018 to December 31 2018, and for each calendar year thereafter, the Buyback Price in a given year shall be the sum of \$0.02061 and the Department's Residential Rate A Generation charge in effect on December 1<sup>st</sup> of the immediately preceding year, rounded to the nearest whole cent.

[Additional language if we grandfather: "Provided, however, that for the 36 months period from the effective date of this tariff, the Buyback Price for those Host Customers on Residential Rate A that have entered into an Interconnection Agreement with the

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TARIFF FOR EMISSION-FREE RENEWABLE GENERATING FACILITIES SERVING  
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Department as of the effective date of this tariff shall be the sum of the following:

- (i) the Distribution Energy Charge; and
  - (ii) the Transmission Energy Charge; and
  - (iii) the Generation Energy; and
  - (iv) the Conservation Energy Charge; and
  - (v) the Purchased Power Adjustment (MDPU No. 110); and
  - (vi) the Rate Stabilization Adjustment (MDPU No. 120); and
  - (vii) NYPA Hydro Power Adjustment (MDPU No. 107).”]
4. For any Billing Period for which the Department calculates a Buyback Credit for a Host Customer, the Department shall apply the Buyback Credit only to the Host Customer’s applicable account. The Department shall carry forward, from Billing Period to Billing Period, any remaining Buyback Credit balance. The quantity and allocation of Buyback Credits shall be limited in accordance with the term of Applicability (8), above in this tariff.

Section 1.06 Determination of EFR Facilities Aggregate Capacity Limit

1. Belmont Light shall not process new applications after such time that the aggregate capacity of all solar distributed generation in Belmont receiving new metering or buyback services in addition to all applications previously submitted to BL under this tariff exceeds 1,000 kW (one megawatt). Upon reaching the 1,000 kW limit, the Belmont Light Board will promptly assess the advisability of further EFR facilities. The Light Board may then increase the EFR Facilities Aggregate Capacity Limit in its discretion.

Section 1.07 Renewable Energy and Environmental Attributes

The provision of net metering or buyback services does not entitle the Department to ownership of, or title to, the renewable energy or environmental attributes, including renewable energy certificates, associated with any electricity produced by an EFR Facility.