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Department of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston , MA 02114

Christopher Derby Kilfoyle  
January 29, 2014

**Re: Comments on the draft revised Renewable Energy Portfolio Standard –Class I Regulation 225 CMR 14.00**

Dear Mr. Judge,

Thank you for the opportunity to submit these comments for DOER and the Joint Committee on Telecommunications , Energy and Utilities to review after the January 24, 2014 Stakeholders meeting at the Statehouse and prior to the final adoption of revisions to 225 CMR 14.00.

BPVS, Berkshire Photovoltaic Services specializes in the design and installation of quality solar electric systems. Formed in 1985, BPVS has a long history of advocacy for responsible support of solar energy by the state. Our Massachusetts citizen owners of PV have participated in multiple iterations of incentive programs for PV administered by DOER, it's predecessors and ancillary agencies funded by both the Massachusetts Renewable Energy Trust and the RPS compliance obligations covered by this regulation.

It is not surprising that the 400 MW solar capacity goals and the exhaustion of the net metering cap occurred early and we support efforts by DOER , the legislature and the Patrick administration to sustain solar electric capacity development in the Commonwealth. BPVS and our potential customers are especially pleased to see the development of a residential, direct ownership loan program.

Environmental responsibility and incentive parity characterize these remarks on the regulation.

**1. Environmental Responsibility**

The RPS Class I REC, Solar Carve Out SREC I and SREC II production incentives are predicated on the trade of the positive environmental attributes associated with clean energy generation. This has always posed a dilemma to PV owners who understand the attributes concept. They are albeit a minority in the state but enough residential, small business, farm , and academic institution, PV owners prefer to claim a reduced environmental footprint at their site rather than sell it..

Since December 2012, this distinction has been codified by the Federal Trade Commission, enforceable under Section 5 of the F.T.C. Act 15 U.S.C. (45) and discussed in their " Green Guide" publication which explains Section 260 of that Act . The relevant language on "Renewable Energy Claims" is in Section 260.15 and on solar PV in particular in paragraph 5 on page 34. Go to :

<http://www.ftc.gov/sites/default/files/greenguides.pdf>

On December 5, 2013 , President Obama showed he understood the reality of selling attributes by issuing the memorandum :[Federal Leadership On Energy Management](#) directing federal agencies, as their first priority to “ retain renewable energy certificates” .. “ to combat climate change, protect the interests of taxpayers, and safeguard the health of our environment”. Just as this White House memorandum cites the duty of the federal government “ to lead by example “ some Massachusetts PV owners have done just that since the start of the RPS.

The DOER webpage [Solar RPS Carve Out](#) states, **“Generators can sell their SRECs to meet a regulatory compliance requirement. They can also sell them to voluntary markets or "retire" their credits as a means of voluntarily supporting solar power.”**

Rather than de-construct the meaning of “retire” and “voluntarily” in light of the actual language of 225 CMR 14:00 and it’s mechanisms of qualifying attributes, we suggest that DOER revise the regulation to qualify those PV systems which choose to retain the attributes with the electrons.

DOER publishes lists of REC & SREC qualified units. **The regulation should mandate a special list for PV systems which retain their attributes, provide a simple way for a PV owner to certify their retention and publish the list as prominently as the SQA list.**

This regulation and DOER policy consistently discuss the “positive environmental attributes” of solar generation in reference to economic values and terms.

**DOER should provide a table or list, updated periodically, through which a PV owner could check just what values their attribute(s), whether sold or retained , equal in deferred emissions.**

PV owners who sell the “positive environmental attributes” of their generation should not be judged as irresponsible. PV is expensive. However the solar marketing in Massachusetts and the incentive programs do not present the option to retain attribute(s) in a clear manner, if at all. In fact the emphasis is on selling SRECs. More often than not, especially in the residential sector the sales pitch to potential PV owners makes the parallel case that PV is a smart investment because it confers personal environmental benefits and the SRECs revenue stream provides a handsome ROI.

Section 14.08 paragraphs ( 1 ) & (2) of the regulation both state that it is the burden of the Retail Electricity Supplier to demonstrate to the satisfaction of DOER that attributes.. “have not otherwise been, nor will be , sold, retired, claimed , or represented as part of electrical energy output or sales..” **A statement of this import with emphasis on the words *claimed or represented* should also be included in the regulation at 14.06 as part of the SQA process and in every promotional or educational communication of DOER and MassCEC on solar programs.** If we are to “lead by example” then these agencies should make a special effort to guide consumers on solar marketing claims about SRECs. **Lets’ be clear that all ratepayers to RPS compliant entities have the real environmental bragging rights on sold PV attributes.**

## 2. Incentive Parity

SRECs II sets the stage for ~1200 MW of new capacity incentives. The 2010 Solar Carve –Out left behind the initial 19 MW of PV capacity installed in state from 1997 - 2010. It may be that less than 12 MW of pre-2010 capacity was confined to the Class I RECs generic production incentive. How many post – 2008 units received eligibility waivers to move up to SREC status is not known to me. The regulation provides for waivers in Section 14.05(4) b. There is a significant portion of small system pre-2010 capacity which never sold their RECS in the first place. Many of these early adopters will retain their attributes with their generation. **This revision of 225 CMR 14.00 is time to offer a meaningful production incentive to those left behind.** It is likely owners representing less than 8 MW will choose, if offered, to trade their generation attributes as SRECS II.

Not incidentally offering SREC II eligibility to this group will restore a consistent intrinsic value to the concept of solar generation attribute(s) lost in this regulation since the Solar Carve –Out revision.

Opponents to re-enfranchising this lost generation make two arguments: 1. these PV owners went ahead with their investment based on the economics of the time and DOER should not look to redress inequities; 2. rebate and grant subsidies from the Massachusetts Renewable Energy Trust (MRET) were so generous then, this group does not deserve the SREC incentive.

The first argument fails when we consider the precedent of DOER stepping in to clear the July 2013 SREC Clearinghouse Auction. That was a costly expense and DOER correctly considered it such a significant interpretation of this regulation that it advised the Joint Committee on Telecommunications Utilities and Energy in April 2013 of its necessity to restore confidence in the Massachusetts PV market. Additionally the Solar Carve –Out regulation revision in late 2009 specifically waived 2010 vintage eligibility requirements for solar PV installations installed in 2008 and 2009 under the very generous Commonwealth Solar Stimulus program provided this subsidy did not exceed 67% of the installation costs .

There were certainly pre -2010 PV installations which received MRET grants or combination of grants and rebates exceeding 67% of their installation cost. Among small systems participating in the SMI, SRI, SRI –OPV and LORI programs as well as through Commonwealth Solar I none that I know of received that level of support yet they are confined to RECs status.

My previous comments on this regulation since 2009 discuss multiple reasons why the Solar Carve –Out unfairly penalized these PV early adopters. The dilution of RECs value and the failure of the RECs trading infrastructure to serve small systems to this day is well documented. At stakeholder meetings on this regulation in the summer of 2013 DOER was asked to have their consultants review the impact of the Solar Carve –Out on PV early adopters and specifically on the small system units installed prior to 2010. The consultant's reports omitted this analysis.

The argument that pre -2010 Massachusetts Renewable Energy Trust (MRET) rebates to small system owners were so generous, that this group does not deserve the SREC incentive would not be supported by objective analysis.

To that end lets' look at a uniform small PV system installation through all rebate programs since 2002 for this sector. To do that a capacity of 3.6 kW DC-STC is the optimal choice because that is the lowest rebate per watt- unit capacity mandated during the various iterations of MTC and MassCEC programs. Lets assume that the system would produce at a 13% capacity factor for 20 years, 1,138.8 kWh per kW per year. Rounded up, that equals 82 MWh generated during a 20 year lifetime.

**Table 1** shows the total capacity of small systems installed per year and their average cost per watt under Massachusetts programs since 2002. The data is sourced from the current spreadsheet of Installers costs on the MassCEC website selecting 10 kW and smaller systems only and one provided by MTC in 2008 selecting all systems listed; predominantly these were under 5 kW in capacity. The Solarize and Commonwealth Solar Stimulus programs, and other pre 2008 unsolicited PV grant units are not included. Of note, 2002 system costs ranged from \$8.48 up to \$19.45 per watt and is a small sample. In 2005 the Romney administration put a moratorium on the PV rebate program from June to October. In 2006 and 2007 increased costs were a result of module scarcity.

**TABLE 1**

<b>Year Contracted</b>	<b>Total kW Installed of &lt;10 kW units</b>	<b>Average \$/W</b>
<b>2002</b> MTC Cluster	<b>303.914</b>	<b>\$12.02</b>
<b>2003</b> SMI	<b>574.891</b>	<b>8.70</b>
<b>2004</b> SMI-OPV	<b>820.75</b>	<b>8.42</b>
<b>2005</b> SMI ...SRI	<b>433.228</b>	<b>8.32</b>
<b>2006</b> SRI	<b>2,427.47</b>	<b>9.13</b>
<b>2007</b> SRI	<b>2,085.20</b>	<b>9.02</b>
<b>2008</b> Com. Solar I	<b>2,479.28</b>	<b>8.56</b>
<b>2009</b> Com. Solar I	<b>1,721.27</b>	<b>7.54</b>
<b>2010</b> Com. Solar 2	<b>3,829.81</b>	<b>6.48</b>
<b>2011</b> Com. Solar 2	<b>8,320.25</b>	<b>5.80</b>
<b>2012</b> Com. Solar 2	<b>13,665.03</b>	<b>4.82</b>
<b>2013</b> Com. Solar 2	<b>10,700.08</b>	<b>4.95</b>

We'll use the \$ per watt cost average from Table 1 for our 3.6 kW case study system- total cost in Table 2 and show the base rebate per Watt per program for the majority of that year, then total rebate . To show the lifetime production incentive value of 82 MWh, a REC value of \$30.per MWh for twenty years is calculated for the unit installed pre 2010 . For post 2010, the value of the SREC is at \$285. per MWh for ten years plus a REC value of \$30.per MWh for an additional 10 years.

**TABLE 2- 3.6 kW DC-STC system**

<b>Year Contracted</b>	<b>Total Cost</b>	<b>Rebate \$/W</b>	<b>Total Rebate</b>	<b>20 year Total REC + SREC \$</b>	<b>Incentives% of total cost</b>
<b>2002</b> MTC Cluster	<b>\$43,272.</b>	<b>\$5.00</b>	<b>\$18,000.</b>	<b>\$2,460.</b>	<b>47%</b>
<b>2003</b> SMI	<b>31,320.</b>	<b>5.00</b>	<b>18,000.</b>	<b>2,460.</b>	<b>65%</b>
<b>2004</b> SMI-OPV	<b>30,312.</b>	<b>4.00</b>	<b>14,400.</b>	<b>2,460.</b>	<b>55%</b>
<b>2005</b> SMI ...SRI	<b>29,952.</b>	<b>3.50</b>	<b>12,600.</b>	<b>2,460.</b>	<b>50%</b>
<b>2006</b> SRI	<b>32,868.</b>	<b>2.50</b>	<b>9,000.</b>	<b>2,460.</b>	<b>35%</b>
<b>2007</b> SRI	<b>32,472.</b>	<b>2.00</b>	<b>7,200.</b>	<b>2,460.</b>	<b>30%</b>
<b>2008</b> Com. Solar I	<b>30,816.</b>	<b>2.00</b>	<b>7,200.</b>	<b>2,460.</b>	<b>31%</b>
<b>2009</b> Com. Solar I	<b>27,144.</b>	<b>1.75</b>	<b>6,300.</b>	<b>2,460.</b>	<b>32%</b>
<b>2010</b> Com. Solar 2	<b>23,328.</b>	<b>1.25</b>	<b>4,500.</b>	<b>14,145.</b>	<b>80%</b>
<b>2011</b> Com. Solar 2	<b>20,880.</b>	<b>.85</b>	<b>3,060.</b>	<b>14,145.</b>	<b>82%</b>
<b>2012</b> Com. Solar 2	<b>17,352.</b>	<b>.40</b>	<b>1,440.</b>	<b>14,145.</b>	<b>90%</b>
<b>2013</b> Com. Solar 2	<b>17,820.</b>	<b>.40</b>	<b>1,440.</b>	<b>14,145.</b>	<b>87%</b>

This very simple analysis is of course over 20 years and does not capture :

- The value of receiving a large rebate soon after installation
- The 20% retainage on rebates in the OPV program paid after 1 year of production reporting. Some of the systems pre-2004 were over 10 kW.
- That some owners received several years of RECS at \$40- 50 each.
- That many owners have not been able to sell RECS since 2007.
- That some owners received a higher value for SRECS in 2010-2012.
- That the values of \$30.per REC or \$285. per SREC will be the true 20 year average.
- Rebate adders for moderate income , moderate home value , Economic target area or Mass manufactured components.
- That in some years the rebate was lower depending on the program changes eg. In 2009 the base rebate for a while was \$1.15 per watt.

Despite these nuances the data in Table 2 is a basis for further analysis of whether pre-2010 systems received a significant advantage over those that are SREC eligible . The various program requirements adjusted rebates and adders in tune with the residential federal tax credit of 2006, its increase in 2008 as well as declining system costs and SRECs.

Table 3 takes this data and looks at the effect on total system cost of the Federal tax credit at the time and the Massachusetts Tax Credit of \$1000.00. Assume this 3.6 kW unit is on the primary residence of a Massachusetts citizen. Then it subtracts the rebate and REC/SREC production incentives to get a cost per solar kWh hour for the owner over twenty years. Then it shows the cost to ratepayers per solar kWh over twenty years by dividing the lifetime production of 82 MWh into the total value of the rebate and REC/SREC production incentives.

Ratepayers of the regulated monopoly utilities pay a system benefit charge to the MRET fund and Retail Electricity suppliers pass on to them the cost of RPS compliance. Omitted of course is consideration of DOER and Rebate program administrative costs and the Net Metering Recovery Surcharge that comes from ratepayers too.

**TABLE 3- 3.6 kW DC-STC System**

Year Contracted	Total Cost After Tax Credits	Total Cost After Tax Credits & Incentives	Solar kWh Cost Owner	Solar kWh Cost Ratepayer
2002 MTC Cluster	\$41,272.	\$20,812.	\$0.253	\$0.249
2003 SMI	30,320.	10,860.	0.132	0.249
2004 SMI-OPV	29,312.	12,452.	0.151	0.205
2005 SMI ...SRI	28,952.	13,892.	0.169	0.183
2006 SRI	29,868.	18,408.	0.224	0.139
2007 SRI	29,472.	19,812.	0.241	0.117
2008 Com. Solar I	20,571.	10,911.	0.133	0.117
2009 Com. Solar I	18,001.	11,401.	0.139	0.106
2010 Com. Solar 2	15,330.	(3,315.)	(0.040)	0.227
2011 Com. Solar 2	13,616.	(3,589.)	(0.043)	0.209
2012 Com. Solar 2	11,146.	(4,439.)	(0.054)	0.190
2013 Com. Solar 2	11,471.	(4,114.)	(0.050)	0.190

Clearly pre -2010 PV system owners from 2004-2009 did not receive a better ROI on their investment than those who installed systems after the Solar Carve-Out and their burden on the ratepayer was significantly less.

DOER could assign a special SRECs II factor for pre -2010 PV owners to align the production incentive parity based on this and further analysis, or because this is such a small group( ~ 1/100<sup>th</sup> of the SRECS II capacity goal) it could simply **absorb this group in Market Sector A of the SREC II program under the same waiver afforded large systems in Section 14.05(4) b.**

Again thank you for considering these comments.

Sincerely,

