



June 26, 2016

Mike Judge
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Renewable Energy Division
Department of Energy Resources
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Sent Via: DOER.SREC@state.ma.us
Michael.Judge@state.ma.us

Re: Comments Designing A New Solar Program

Dear Mr. Judge:

The first solar program really started as a demonstration project and soon encouraged a new industry within the Commonwealth. The SREC program demonstrated how capital could be attracted to a nascent, low margin industry. Improving on what has been learned and given the transition to renewables by the Commonwealth, the next solar program should be defined by achieving a certain percentage the Commonwealth's total consumption generated by solar with equal access for all.

Equal Access For All

A supermajority of homeowners, renters, condominium owners, low income and businesses currently do not have access to solar because of a lack of available roof space or land. Access to Community Solar should be the primary driver of policy at full retail. All ratepayers pay for solar and all ratepayers should have access to solar. The discounted solar rate coming from a solar entity to a customer on a kilowatt-hour basis is greater than the cost. (see cost schedule below)

All businesses regardless of size need access to Community Solar. Currently, Community Solar is capped at a private sector, one-megawatt size project and two-megawatt size project in the event of public housing. Credit worthiness of an off-taker excludes many businesses who have good credit, but do not qualify as bankable credit. If a business is greater than 25 kW and is less than a 300 kW consumer, which roughly is equivalent to a \$33,000 electricity bill, this entire sector is left without access to Community Solar due to not being a bankable credit and yet represents most small businesses in the Commonwealth.

Promulgate Community Solar regulations at full retail with equal access for all ratepayers within the Commonwealth.

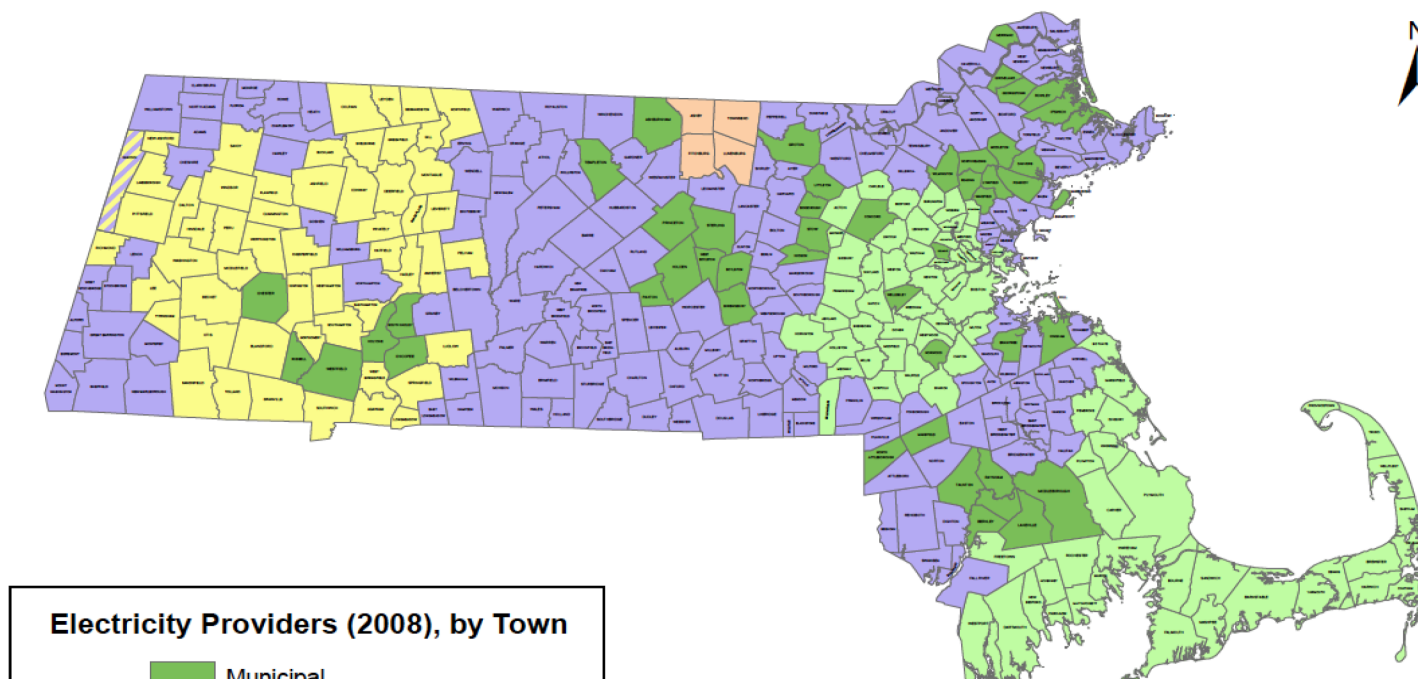
Legislative authorization: DOER should seek authorization from the legislature to establish net metering and distributed generation policy to which DPU would administer.

Until net metering is replaced by another means of valuing distributed generation, with the legislation of minimum bills for the utilities, net metering should be uncapped. If DOER needs to throttle the industry, it has plenty of leverage within the incentive or transition payment structure.

DOER policies implemented by DPU relative to Community Solar (CS) :

- 1) Within a utility holding company, CS ratepayers should have access to solar generated in one ISO zone and net metered to another ISO zone. This will allow urban core access to solar generated in the western part of the state. There simply is not enough available landmass to adequately service the urban core with solar PV. Additionally, this policy will allow the western areas of the state to participate in the energy economy fueled by the equal access of the urban core. The urban core is basically Boston and the area surrounding Route 128 and Route 495.
- 2) Eliminate the public and private sector net metering constraints surrounding CS. A small town or public entity should be allowed to be an off-taker with a CS group of private citizens as an example.
- 3) Raise the size of systems capable of being net metered from two-megawatts back to six-megawatts to match the incentive program.
- 4) Provide policy for condominiums, multi-family housing and large landowners such as farmers who own land on both sides of a road from being restricted to one meter per lot.

The light green and yellow are Eversource service areas below. Purple National Grid:



* While this letter is in response to a DOER request for comments and that DOER may not consider DPU issues pertinent to the new solar discussions, both departments are under the same Executive Office of Energy and Environment Affairs and that policy changes are capable of being managed accordingly.

Establish A Policy Of Consistency:

The alternating lack of solar incentives followed by lack of net metering availability has been brutal on small businesses and causes investors to spend their time and money looking elsewhere for investments. Net metering and solar incentives need to exist together.

Growth management in SREC II was required due to a small program size, but the new program should have larger installed capacity and emissions avoidance objectives. With larger installed capacity objectives, the new solar program should not be unduly constrained, as was required in SREC II.

As the Commonwealth transitions to renewables, it is important for the market to know the long term forecast of how much wind, solar and other DG will be installed in order for base load generators to forecast capacity and generating obligations. The Baker-Polito Administration needs to set 10-year installation targets for in-state solar, wind and other DG industries. It is through this declaration and dedication to emission reductions that consistency of policy will be developed. An energy economy will be started within the Commonwealth. An apprentice electrician can look to accumulating his or her two thousand hours to become a journeyman in solar and other renewables and build a career around renewables for a generation.

SREC, Feed-In-Tariff or Hybrid:

DPU is a highly structured adjudicatory department dealing mostly with utilities and infrastructure and as such is not as responsive to the distributed generation industry that is made up primarily of entrepreneurial small and medium size businesses. The legal cost being adequately represented at DPU is another barrier to effecting responsive change. As a policy department, DOER has been much more responsive to the policy needs of the solar industry. It is with DOER that the policy development and implementation should remain.

SREC's without a hard floor is not providing incentives to directly fund project development but to the financing of risk. Developers without a enormous balance sheet will be hit with a discount on SREC's or a call for more equity by their banks or financing entities, raising the cost of capital on a project for most developers. Often, even those with a large balance sheet do not want to leverage those assets on solar.

A hybrid approach, if legally achievable, might be for DOER to design and adopt the policy and for DPU to implement a directive for the utilities or other competitive suppliers to purchase renewable attributes at a given rate.

Price Suppression Effects of Solar Through Avoided Generation and Capacity:

“All generators get the LMP price of the most expensive generator operating in each hour. Solar generation (and all other intermittent generation) causes the ISO to back off the most expensive unit in each LMP hour and therefore causes the ISO to pay a lower LMP price to all generators, not just solar or wind.

Consumers benefit two ways; lower capacity prices and lower energy prices, no matter what fuel is used.”¹

Until solar generation starts to compete with itself, which former DPU staff has identified as between 15%-20% of installed capacity, solar will reduce the cost to all ratepayers through the avoided cost of reduced capacity and generation cost.

With the retirement of ten thousand megawatts of coal, oil and nuclear generation, installing significant levels of solar is not taking economic viability from other generators. In fact, by announcing the long term build rate of solar and off shore wind, generators will build or re-fit plants to deal with capacity demands of increasing levels of renewables.

Given the unique timing of retiring generation assets, DOER should engage a specific energy economic study that explores the price suppression effects of solar. Price suppression due to renewables is not arbitrary nor artificial as the achievement of GWSA emission reductions are a function of state policy as referred to in FERC Docket No. EL13-34-00, ISO-NE vs. New England States.

Would the installation of solar be less or equal to natural gas plants receiving reliability capacity payments to be on standby, as a fixed cost, be less than variable cost of a natural gas plant in operation accumulating depreciation and consuming fuel? Commonsense would say yes.

Exclusive of the value of solar study, will solar pay for itself on this basis alone? If the ISO-NE graph shown below, on Chart A for a single day in May, is illustrative of capacity and energy savings at a 1,000 MW (nameplate not de-rated) or 1-2% of total generation capacity, the savings to ratepayers as the Commonwealth transitions to solar and other renewables will be very significant. If the savings is equal to or greater than \$0.00630 per kWh, then the solar program will pay for itself at a build rate of 800 MW per year under current net metering and solar incentives. (Chart B). One to two percent of solar generation is already changing the marginal wholesale clearing price.

Given the spikes in LMP pricing over the past several years and with lesser but still significant rates to remain high through 2019, transitioning to solar may be the best investment the ratepayers could make.

DOER should engage in an energy economic study to specifically study the price suppression effects of solar through 15%-20% of installed capacity. If the price suppression effects of solar is equal to or exceeds the cost of \$0.00630 per kWh, transitioning to solar and renewables is a cost benefit to ratepayers on this basis alone.

¹ Mitchell Jacobs, Energy Management, Inc. March 16, 2016

Chart A

Solar Power's Effect on Hourly Electricity Demand May 23, 2015

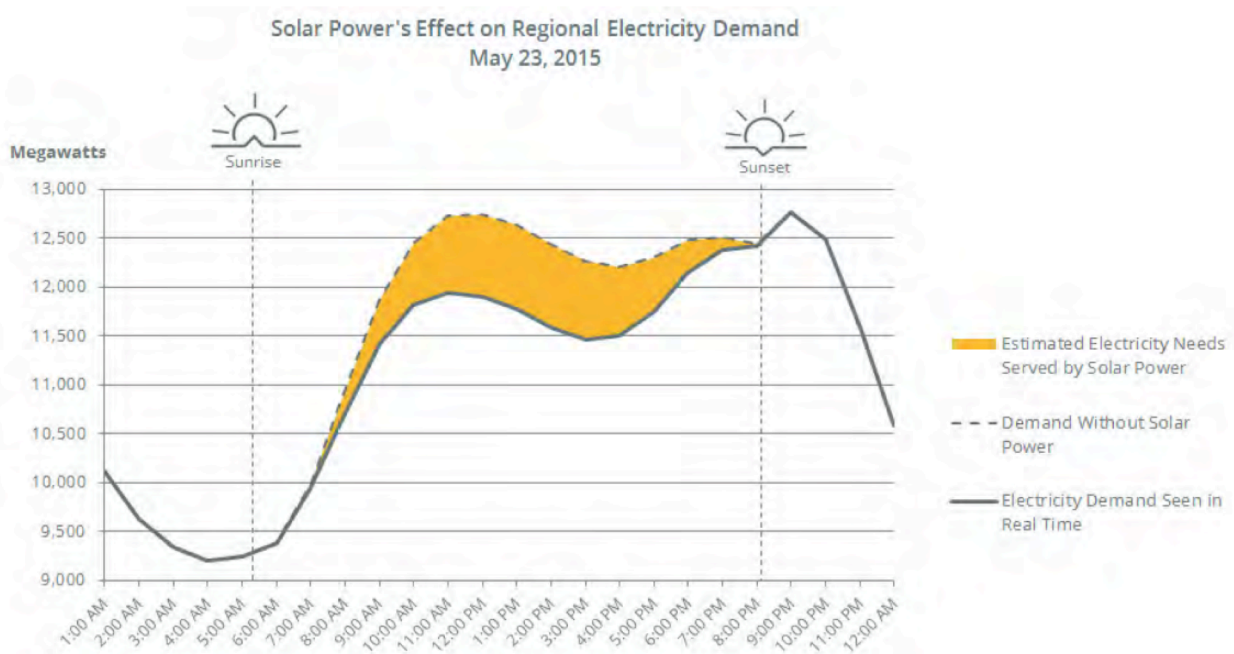


Chart B

	A	B	C	D	E	F
1		Cost Per kWh of SREC Program				
2						
3	A	Solar Installed and Billable to Ratepayers	800	MW	input variable	
4	B	Average PV Solar Capacity Factor	13.21%			
5	C	Hours per year	8766	hrs/yr		
6	D	Annual Solar PV Energy Production	926,391	MWh/yr	(D=A*B*C)	
7	E	Cost of SRECs (priced at Floor) + net metering	\$335	per MWh	input variable	
8	F	Annual Cost of SREC Program	\$310,340,945	per year	(F=D*E)	
9	G	Annual System Load	49,253,000	MWh/yr	variable DOER RPS 2013	
10	H	SREC Charge per unit Energy Consumed	\$6.30	per MWh	(H=F/G)	
11	I	kWhs per MWh	1000	kWh/MWh		
12	J	Unit SREC Charge in Customer Bills	\$0.00630	per kWh	(J=H/I)	
13	K	Average NSTAR Residential Customer Energy Consumption	500	kWh/Mo	input variable	
14	L	Average NSTAR Residential Monthly Cost of SREC Program	\$3.15	per month	(L=J*K)	
15	M	Months per Year	12	mo/yr		
16	N	Average NSTAR Residential Annual Cost of SREC Program	\$37.81	per year	(N=L*M)	
17						
18						
19						

Competitive Supply:

DOER has requested comment on using the competitive supply model as an alternative approach to bridge or substitute the gaps in net metering. Competitive supply is regulated by DPU under 220 CMR 11.00 and requires the Competitive Supplier to be a contractual participant of NEPOOL and demonstrate certain performance-based interactions with the Distribution Companies through Electronic Business Transaction Standards. Most solar companies would not be engaged in this side of the business and fees for a Competitive Supplier to manage anything but very large projects would be prohibitive.

Complying with ISO guarantees of delivery of service would be difficult without being backed up by hydro or natural gas.

As solar project owners are already in possession of generation, a separate proceeding at DPU allowing solar developers to be a Competitive Supplier for solar only, would be an option to explore. But this would have to be a DPU competitive supply regulation that recognizes a distributed generation tied supplier with no ISO-NE obligations.

Due to the current regulations, the contractual and organizational cost of complying with ISO-NE requirements it does not appear that competitive supply will be an easy option to employ as intended at this time.

Energy Storage:

Energy storage will be transformative relative servicing issues surrounding distributed generation. We understand that DOER will be issuing a report that describes monetizing storage capabilities and we look forward to reading that report.

Use of Agricultural Land:

At the listening session, a speaker spoke eloquently about regulating farmland. I was not given the impression the speaker was speaking on behalf of farmers. Our firm has installed solar on agricultural land. The farmer designated sloped, non-productive land for use by the solar project. Farmers understand the land, understand utilization of land and are very particular about how their land is used. We are working with other farmers and farm families and each farm is trying to use the income from solar to stay in the farming business.

Dual use of land was mentioned and could be incentivized at the rate of \$0.85 to \$1.00 per watt for a canopy solar system raising the solar system fourteen feet above the grade to allow tractors and equipment to service the land below.

Raise the RPS:

DOER should be the policy development voice to advise the legislature to raise the RPS to meet the introduction of significantly increasing levels of deployment of solar and wind within the Commonwealth.

SJC – 11961 Kain vs. Department of Environmental Protection:

In addition to stipulating “aggregate emission limits for each regulated source or category of sources must decline on an annual basis” and that the “regulatory schemes on which the department relies in this case do not comport with the specific requirements of Sec 3 (d)”, as well as stipulating reductions must be achieved within the Commonwealth. In addition, the court found that RGGI does not qualify for reduction calculations within the Commonwealth.

As the department and EEA are required to promulgate new regulations reducing emissions by each sector, the department should use access to solar as a means of not increasing cost on industry while meeting the requirements of the court.

Industry sectors that are required to reduce emissions could install solar, purchase solar through a PPA (Power Purchase Agreement) or a PPA whose access is provided by Community Solar. Solar is measureable, it is a zero emissions resource and compliance is simply through filing of a copy of the PPA. Little burden is placed on industry for initial compliance.

The transportation sector could be encouraged through the solar program combining solar and battery installations with electric charging stations at gas stations and retail areas of public accommodation. Such installations could also be encouraged through the use of solar PPA agreements.

In that same vein, solar should remain part of any Commercial Pace (C-Pace) program as the income from solar may assist paying the debt of other improvements with a longer pay back. Access to the ITC and MACRS depreciation may be an incentive to break the decision making process into a movement towards installing emissions saving improvements.

Alignment of Utility Companies:

Every distributed generation company requires healthy utilities in order to develop and operate projects. As DOER moves to establish cost parameters for the new solar program where large penetrations of DG are incentivized, interconnection cost need to be dealt with on a levelized basis considering the system benefits to be achieved.

Where every ratepayer has access to solar, the utilities should be compensated to encourage the development of DG as opposed to being obligated to perform as simply another function of their decoupled, deregulated franchise. To the ratepayer, a minimum bill might be revenue neutral but addressed in the rate recovery tariff levelized across all ratepayers.

Benchmarking Incentive Levels in New Solar Program:

Block incentives are aspirational and are not reflective of real conditions that may occur in the future. The new incentive, or transition to renewables program, should be benchmarked off of the following drivers of cost:

- 1) Prevailing wages as published by the Department of Labor and Industries.
- 2) Cost of new, solar panels averaged off of the Bloomberg list of high yield solar panels.

- 3) Interest rates
- 4) Payment in Lieu of Tax agreements with local municipalities.
- 5) Interconnection and utility fees.

Transition to the New Solar Program:

The transition to the new solar program should financially be equivalent to the SREC II and net metering schedule with full net metering available with equal access for all through Community Solar. An opt-in provision should exist to allow developers the ability to either stay in SREC II or move to the new solar program as it may serve all stakeholder to have a certain overlap of the end of the existing and the start of a new program.

Comprehensive Energy Planning:

In a presentation to a Senate Committee, lead by Sen. Marc Pacheco on June 21, 2016, The Brattle Group spoke of the need for “comprehensive energy planning” as the Commonwealth struggles with these complex issues on a regular basis.

EOEEA through DOER should be engaged in such a comprehensive planning effort. Considering the timing of having ten thousand megawatts retiring, with compliance obligations of the GWSA, compliance with Kane vs. DEP, concurrent with the emergence of solar and wind technology and a desire to build jobs and retain energy dollars within the state, the time is now for the state to act.

In the last paragraph on the Overall Recommendations of the Brattle Group dated June 21, 2016 they state the following:

“Electricity rates are not the only cost considerations for customers or for the economy. For instance, energy policy should focus not just on rates, but also on total customer bills. Comparatively high rates may translate into relatively low bills when progressive energy efficiency policies enable customers to use less electricity, or when rates are designed to provide customers incentives to reduce electricity use at times of system peak demand. Finally, certain energy policies, like those mandating energy efficiency, solar PV, and offshore wind, can be engines of economic growth as new opportunities for employment are created in Massachusetts.”

We appreciate DOER soliciting industry input on the engaged consultants survey, on holding listening session and on this ability comment on the design of a new solar program in the Commonwealth.

Best Regards,

Doug Pope
President

