Edison Electric INSTITUTE

Power by Association℠

**Comments of the Edison Electric Institute**
**Next Generation Solar Incentive Straw Proposal**

**October 28, 2016**

The Edison Electric Institute (EEI) respectfully submits these comments to the Massachusetts Department of Energy Resources (DOER or the Department) regarding the Next Generation Solar Incentive Straw Proposal that was posted on September 23, 2016. EEI, which includes three Massachusetts utilities among our membership (Eversource, National Grid, and Unitil), appreciates the opportunity to provide the Department with a national perspective on factors that are promoting the rapid growth of solar energy.

EEI is the association that represents all U.S. investor-owned electric companies, as well as a number of international affiliates and industry associates worldwide. Our members provide electricity for 220 million Americans, operate in all 50 states and the District of Columbia, and directly employ more than 500,000 workers. With more than $100 billion in annual capital expenditures, the electric power industry is responsible for millions of additional jobs. Reliable, affordable and sustainable electricity powers the economy and enhances the lives of all Americans. Our members include the local distribution and transmission companies that interconnect solar generators to the larger energy grid and then continue to provide them a range of services.

America's electric utilities continue to lead the way on solar energy and are giving their customers a number of solar choices via large-scale solar power plants that provide universal solar, community partnerships, residential private solar programs, and green power programs

among other options.[1] As leaders in renewable energy, electric utilities provide virtually all of the wind, geothermal and hydropower in the country. Our members also have installed about 60 percent of U.S. solar capacity and are on pace to install nearly three times as much solar in 2016 as we did in 2015, with the goal of bringing cost-effective solar to all customers. Utilities everywhere are increasing their investment in solar and are expected to invest $9 billion per year in solar through 2020, with an additional $40 billion per year in investments to help manage the integration of solar and other new technologies into the power grid.

As the U.S. moves to a low-carbon future, EEI is working with our member companies, policymakers and stakeholders across the country to assure that the transition to a clean energy future keeps electricity costs affordable, protects reliability and enhances resiliency. Because solar power is so important to the transition of the generation fleet and providing customers with the clean low-carbon electricity they desire, EEI is focused on getting the policies that support solar right and would encourage DOER to structure its solar policies in a way that continues to drive solar costs lower, rewards the lowest cost solar providers and helps keep electric customer costs low.

***Under the Proposed Next Generation Solar Incentive, Solar Power in Massachusetts Would Continue to Benefit from Some of the Highest Subsidies in the Country***

Under today's construct, Massachusetts has one of the highest solar subsidies in the country, second only to California.[2] In fact, a recent study by the Consumer Energy Alliance found that available subsidies in Massachusetts actually cover more than a customer's cost to install the private solar facility, by upwards of 185 percent.[3] While subsidies are understandably an

[1] EEI recognizes that current Massachusetts law prohibits utility ownership of solar generation in excess of 35 MW; however, as discussed in more detail herein, it is important when considering solar energy policy to recognize that larger-scale universal solar projects are roughly half the cost of other solar options, irrespective of ownership, and offer the most cost-effective way to grow solar.

[2] Consumer Energy Alliance, *Incentivizing Solar Energy: An In-Depth Analysis of U.S. Solar Incentives*, pp. 8-9 http://consumerenergyalliance.org/cms/wp-content/uploads/2016/09/Solar-incentive-report-FINAL.pdf.

[3] *Id.* at 21-22.

important policy tool, this level of subsidization at nearly twice the cost of the product, is not only unnecessary to achieve the Department's policy objective of promoting solar in the commonwealth, but comes at a significant cost to utility customers.

Under the Department's current program, which provides a subsidy through the production and sale of solar renewable energy credits (SRECs), the private solar installed in Massachusetts has the potential to generate SRECs with an annual cost to customers of nearly $500 million in 2015 alone. In the Next Generation Solar Incentive Straw Proposal, the Department takes an important and necessary step towards reducing the level of solar subsidies in Massachusetts. While the Department's proposal represents a step in the right direction by reducing the overall subsidy amount, under even relatively conservative assumptions, however, the proposed Next Generation Solar Incentive still has the potential to cost Massachusetts customers an additional $4 to $6 billion over the course of the program. In weighing the evidence to determine the necessary and appropriate level at which to continue to subsidize solar, DOER should strongly consider not only the impact on customers but the plethora of alternative funding sources that remain available.

There are a number of programs available aside from the SREC program, which this new program would replace, that continue to drive the growth of solar generation in both Massachusetts and across the country. By way of example, some of these programs include the federal Investment Tax Credit (ITC) for solar that will continue to provide a 30 percent credit through 2018, and then slowly taper to 10 percent by 2022 for commercial projects and disappear for residential projects. In addition to the ITC, there are currently over thirty subsidy programs specific to Massachusetts supporting solar growth including retail net energy metering programs,[4] a variety of favorable state loan and grant programs, a 15 percent state income tax

[4] Based on EIA average rates, the additional subsidy provided via net energy metering in Massachusetts, as calculated by the difference between retail and wholesale rates, is greater than $135/MWh for residential and $105/MWh for commercial and industrial consumers.

credit for up to $1,000 in net renewable expenditures, and property, sales and excise tax exemptions as well.[5]

Unfortunately, these large subsidies, combined with the significant cost reductions of solar photovoltaic (PV) systems, have not reduced the prices consumers pay for installing solar systems. In fact, these subsidies seem to have had the opposite effect. In August 2015, Lawrence Berkley National Laboratory (LBNL), a U.S. Department of Energy research laboratory, issued a report that found that installed prices for PV systems are actually the highest in states that offer the highest subsidies, which, as noted above, includes Massachusetts.[6] In fact, median 2014 prices for residential systems in Massachusetts were 20 percent higher than in New Hampshire, a state with fewer subsidies ($4.40/Watt (DC) in Massachusetts compared to $3.60/Watt (DC) in New Hampshire).[7] Similar to Massachusetts, Connecticut's median price is also higher, and net metering and other state subsidies for residential customers, together with the ITC, more than pay for the cost of a residential solar system in that state. Since Massachusetts offers even higher subsidies, the cumulative impact is even greater and should be considered when determining the right structure for any solar program moving forward.

***Competitive Procurement of Solar Energy Enables Comparable Quantities of Solar at a Lower Cost to Customers.***

In developing the Next Generation Solar Incentive, the DOER appears to have two clear goals: 1) to continue to expand the growth of solar power throughout all sectors by ensuring widespread access to incentives for all ratepayers, and 2) to provide clear policy mechanisms that will control costs to ratepayers.

[5] *See* DSIRE, *Programs*, http://programs.dsireusa.org/system/program?state=MA.

[6] Lawrence Berkeley National Lab, *Tracking the Sun VIII The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States*, (August 2015) http://eetd.lbl.gov/publications/tracking-the-sun-viii-the-installed-p.

[7] *Id.* at 29.

Compared to the existing SREC program, the tariff mechanism that DOER has proposed is a clear step in the right direction as it will likely allow the growth of solar power at a lower overall cost than the SREC I and II programs. In the current environment of falling solar costs, however, it is likely that a fixed, albeit declining, tariff program, will continue to over-subsidize solar generation as discussed above, and shift market risks from developers to consumers.

There are two main ways in which policymakers throughout the world have incentivized the development of renewable energy: 1) by setting a volume target and letting the market decide the best price (i.e., Renewable Portfolio Standards (RPS) or competitive solicitations); or 2) by administratively setting the price and letting the market decide how much renewable capacity will be deployed (tariff, or feed-in-tariffs (FIT)). Both systems have advantages and disadvantages. In the RPS-type program or competitive solicitation, the risk is generally put on developers that are forced to compete in the marketplace. In a FIT scenario with a tariff rate that is not set at a market-reflective rate, the risk falls on customers, who can easily end up overpaying for renewable energy while developers bear little to no risk. The DOER is proposing a hybrid option by which it pre-sets both the level of deployment and the price of solar power. While this formula can certainly protect consumers by limiting the amount of solar to be installed under the program, it has the very real potential to significantly overshoot the price it pays for solar power.

Experience shows that programs based on a fixed, administratively set tariff have not always produced the intended results and, over time, have continually been replaced by market-based mechanisms. For example, Germany and other European countries, Australia, Japan, Canada (Ontario), and even closer to home in Vermont,[8] all favored FIT programs to support the deployment of renewable energy in the late 1990s and early 2000s. Since the tariffs did not

[8] In 2009, Vermont enacted legislation that required retail electricity providers to purchase electricity generated by solar and other eligible renewable energy facilities via long-term contracts with fixed standard offer rates (Standard Offer Program). In 2013, the Public Service Board (PSB) established a new market-based pricing mechanism per S.B. 214 (Act 170) that replaced the feed-in tariff system. Since then, contracts (10-25 years for solar) are awarded though a Request for Proposal process. Contracts are selected competitively based on the proposed $/kWh structure. The PSB sets avoided cost rates that are used as annual per-kWh cost caps for contracts. http://programs.dsireusa.org/system/program/detail/5680.

follow market developments and price reductions, the incentives revealed themselves to be excessive and resulted in a myriad of unintended consequences, not least of which was a rapid increase of retail electricity prices in many cases.[9] In the last few years, country after country and jurisdiction after jurisdiction has reversed its policies and replaced its programs based on tariffs with market-based mechanisms so as to ensure a sustainable deployment of renewable technologies, avoid boom-bust cycles, shift risk back from consumers to developers, and avoid unnecessary costs to consumers.[10]

Competitive procurement continues to be the most cost-effective way to deploy solar power for the benefit of all consumers. In fact, all around the country, competitive solicitation and bilateral contracting are the most common methods used by utilities to procure energy, including clean energy. Competitive procurement strategies have always allowed utilities to "balance their priorities of cost and reliability…[c]ompetitive solicitations, auctions, and bilateral contracting allow utilities to exert control over factors like quantity procured, generation profile, project siting, and reliability."[11] This helps to manage cost and drive efficiencies in the procurement process.

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[9] See for instance, Finadvice, *Development and Integration of Renewable Energy: Lessons Learned from Germany*, July 2014 http://www.finadvice.at/files/germany_lessonslearned_final_071014.pdf

[10] In 2013, the European Commission issued guidance recommending that "support schemes should be flexible and respond to falling production costs. As technologies mature, schemes should be gradually removed. For instance, feed in tariffs should be replaced by feed in premiums and other support instruments that incentivise producers to respond to market developments" https://ec.europa.eu/energy/en/topics/renewable-energy/support-schemes. Germany, the poster child of solar deployment and support mechanisms based on tariffs repeatedly reformed its FIT program over the years. It recently eliminated it altogether and, in 2017, incentives for renewable power will be market-based for all installations larger than 750 kW. *See* Institute for Energy Research, *The High Cost of Rooftop Solar Subsidies, How Net Metering Programs Burden the American People*, pp. 7-8, (October 2016) http://instituteforenergyresearch.org/wp-content/uploads/2016/10/The-High-Cost-of-Rooftop-Solar-Subsidies-Oct-16.pdf

[11] NREL, *Procurement Options for New Renewable Electricity Supply*, Dec 2011, p.vi, http://www.nrel.gov/docs/fy12osti/52983.pdf.

There is also no reason to think that if market-based pricing mechanisms are successful in promoting solar power in neighboring states, they would not be in Massachusetts as well. As mentioned earlier, Vermont, for example, replaced its FIT in 2013 with a competitive process by which incentives are determined by a Request for Proposal (RFP) process. The state only sets the maximum incentive ($0.13/kWh for solar in 2016). Through this competitive procurement process, Vermont has achieved a local solar industry that is comparable to that of Massachusetts, albeit at a reduced scale. For example, after accounting for population differences, both states have similar installed solar capacity per capita as well as percentage of employment in the solar industry.

**Table 1. Solar industry in Massachusetts and Vermont (2015)**

| | Massachusetts | Vermont |
|---|---|---|
| Solar companies * | 448 | 80 |
| Solar employment* | 15,095 | 1,367 |
| Total installed capacity (MW)* | 1,199 | 127 |
| Population (2014) ** | 6,745,000 | 626,562 |
| Installed solar per capita (W/person) | 178 | 203 |
| Solar employment (% of total population) | 0.22% | 0.22% |

Sources:

* SEIA, State Solar Policy, Massachusetts, September 2016, http://www.seia.org/sites/default/files/MA%20State%20Fact%20Sheet_9.9.2016_0.pdf
* SEIA, State Solar Policy, Vermont, September 2016, http://www.seia.org/sites/default/files/VT%20State%20Fact%20Sheet_9.9.2016.pdf

** United States Census Bureau

Moreover, the three top solar developers in Massachusetts (SolarCity, Vivint and Astrum Solar[12]) also operate in neighboring states, which leads to the conclusion that either their

[12] Residential Solar 101, Top 25 residential solar installers in Massachusetts. http://www.residentialsolar101.org/top-25-residential-solar-installers-in-massachusetts/

incentive programs must cover all their revenue requirements and provide adequate rates of return, or Massachusetts subsidies must be fostering renewable energy in other states as well.

Competitive procurement mechanisms are also a cost-effective tool to buy and promote the deployment of distributed resources in general, including distributed solar. NREL has found that "(c)ompetitive procurement mechanisms or auctions allow for market-based pricing, which can be important in an environment with rapidly changing pricing."[13] As discussed above, rapidly declining prices are precisely one of the main characteristics of the solar market today. While the declining block structure of the Next Generation Solar Incentive Straw Proposal is a positive step to at least attempt to administratively reflect the continuous cost declines of solar installation and technologies, market mechanisms allow for cost-effective procurement without the need to anticipate, and most likely misjudge, the evolution of costs. Competitive processes have the advantage of ensuring that the best and/or cheapest resources are acquired at all times.

Many utilities are successfully implementing competitive procurement programs. For example, California's Reverse Auction Mechanism is designed to streamline the procurement process for distributed generation projects between 3 MW and 20 MW. After being screened for viability, each bid is selected based on price and given a standard contact from the utility. This mechanism ensures that utilities obtain a portion of their RPS requirement at the lowest possible cost for consumers. [14] As SEIA points out, reverse auctions are "very attractive to policy makers, as developers are paid a price that is sufficient to bring projects online, but also provide ratepayer protection against 'overpayment.'"[15]

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[13] NREL, *Distributed Solar Incentive Programs: Recent Experience and Best Practices for Design and Implementation*, Dec 2012, p. iv, http://www.nrel.gov/docs/fy13osti/56308.pdf.

[14] DSIRE, *Renewable Auction Mechanism (RAM)*, May 17, 2016, http://programs.dsireusa.org/system/program/detail/4979.

[15] SEIA, *Reverse Auction Mechanism*, https://www.seia.org/policy/renewable-energy-deployment/reverse-auction-mechanism.

Unlike Massachusetts, other states with solar carve outs in their RPSs have created competitive markets where SRECs are traded competitively. New Jersey was the first state to develop SRECs in 2005. Today, Delaware, Maryland, Ohio, Pennsylvania and Washington, D.C also have active SREC markets. Massachusetts, however, is the only state that has a price-protection mechanism through the Solar Credit Clearinghouse Auction. All other states have auctions where the SREC prices are only restricted upwards at the alternative compliance payment level,[16] which have resulted in lower costs of solar power to customers while still driving solar growth. With the exception of Washington, D.C., which is severely resource-constrained, the current SREC compensation levels in Massachusetts and New Jersey are significantly higher than all other states. In fact, SRECs in these two states are exponentially more costly than the remaining states.[17] While recent SREC prices in Massachusetts and New Jersey are roughly equivalent, Massachusetts continues to pay significantly higher prices for solar power because its average electricity rate is more than 25 percent higher than that of New Jersey.

There are also states which, working with their utilities, are implementing programs where solar projects are subject to competitive bidding. For example, Xcel Energy in Colorado, has implemented a *Solar*Rewards Community Program*, designed to incent community solar projects up to 2 MW. Through this program, the utility solicits bids through a competitive RFP and purchases the project RECs at a price specified in the developer's bid.[18] NV Energy in Nevada implemented a similar program in 2015, the *Subscription Solar Pilot Program*, by which the company issued RFPs for projects up to 10 MW.[19] Other EEI member companies are also deploying similar programs that rely on competitive procurement of solar resources resulting in prices substantially less than Massachusetts.

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[16] DSIRE, *Programs*, http://programs.dsireusa.org/system/program?type=85&.

[17] U.S. Department of Energy, *Green Power Markets*, http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5.

[18] DSIRE, *Xcel Energy – Solar* Rewards Community Program*, http://programs.dsireusa.org/system/program/detail/5295.

[19] NV Energy News Release, *Customer Interest for Subscription Solar Pilot Program Strong*, https://nvenergy.mediaroom.com/index.php?s=8838&item=136923.

***Paying the Largest Subsidy for the Least Efficient and Highest Cost Solar Arrays Results in Customers Paying More for the Same Sun***

Solar generation costs have been declining rapidly in recent years and are projected to continue to decline. In fact, over the past ten years, the average cost of PV has declined by more than 73 percent.[20] While private rooftop solar costs have dropped by almost 45 percent since the inception of DOER's first SREC program in 2010, the costs of larger-scale universal solar generation have dropped even more significantly even though the solar PV panels used for both private and universal solar are the same.[21] The higher costs of private solar are primarily due to high installation costs and low capacity factors.

The Next Generation Solar Incentive Straw Proposal, however, appears to recommend almost double the subsidy for these higher cost, less efficient units. A number of recent studies, including "The Future of Solar Energy" from the Massachusetts Institute of Technology's (MIT) Energy Initiative, have consistently concluded that larger-scale universal solar projects, which are roughly half the cost of other solar options, offer the most cost-effective way to grow solar.[22] The study discusses at length the important policy considerations and disconnect between the application of higher subsidies, as currently being proposed by DOER, for the less efficient and higher cost smaller solar generation facilities.[23] The MIT report focuses on the value of

[20] Solar Energy Industries Association, *Solar Industry Data*, http://www.seia.org/research-resources/solar-industry-data.

[21] In many places, and at some times during the day, large-scale solar renewables can even compete directly with traditional natural gas-based generation, which sets marginal prices in most electricity markets, including Massachusetts. *See* Lazard, *Levelized Cost of Energy Analysis - Version 9.0* (Sept. 2015), https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf.

[22] *See also* Bruce Tsuchida et al., Brattle, *Comparative Generation Costs of Utility-Scale and Residential-Scale PV in Xcel Energy Colorado's Service Territory* (July 2015), http://brattle.com/system/publications/pdfs/000/005/188/original/Comparative_Generation_Costs_of_Utility-Scale_and_Residential-Scale_PV_in_Xcel_Energy_Colorado%27s_Service_Area.pdf?1436797265.

[23] *See* MIT Energy Initiative, *The Future of Solar Energy*, May 5, 2015, http://mitei.mit.edu/system/files/MIT%20Future%20of%20Solar%20Energy%20Study_compressed.pdf.

electricity produced per dollar of subsidy spending in seeking to ensure that subsidy dollars are spent in the most effective and economically efficient manner, thereby growing solar while also protecting customers.

If DOER truly wants to "maintain robust growth across installation sectors," as it states in the September 23 presentation, while providing "clear policy mechanisms that control ratepayers' costs and exposure", it should seek to create a level playing field among all solar resources.

***Conclusion***

At the end of the day, all forms of clean power, including solar, should be encouraged to develop in a context that promotes these resources at the lowest cost to all electricity customers. While each state faces its own unique challenges, all should share this goal. Under that guiding principle, EEI strongly encourages DOER to use this opportunity to modify the Next Generation Solar Incentive in a manner that includes a more competitive process in order to drive solar costs lower, that rewards or at least places on a level playing field the lowest cost solar providers, and that helps keep electric customer costs low.

Respectfully submitted,

Richard F. McMahon, Jr.
Vice President

Adam L. Benshoff
Senior Attorney

Edison Electric Institute
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Phone: (202) 508-5019
Email: abenshoff@eei.org