



February 15, 2017

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
100 Cambridge Street
9th Floor
Boston, MA 02114

Judith Judson, Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street
10th Floor
Boston, MA 02116

RE: Solar Massachusetts Renewable Target – Industry Comments

Dear Secretary Beaton & Commissioner Judson:

The undersigned organizations and industry associations, on behalf of their member companies, write to provide you with our collective comments regarding the latest version of the Solar Massachusetts Renewable Target (SMART) program, presented to the public on January 31, 2017. We appreciate the Department of Energy Resources' (DOER) efforts over the last several months in ensuring that a vigorous public process has occurred and we are grateful to the Renewable and Alternative Energy Division staff for their engagement and open dialogue with stakeholders.

Many of the features of SMART will enable the continued growth of Massachusetts' solar industry, which has created more than 14,000 jobs to date, injected billions of dollars into local economies, helped address peak demand issues, contributed to the Commonwealth's greenhouse gas (GHG) reduction goals, and enabled thousands of municipalities, businesses, and citizens to save millions on their energy costs.

There are, however, several changes to SMART from DOER's original September 23, 2016 proposal that, if not addressed, could inhibit the transition from the SREC program to the SMART program and restrain the overall deployment of solar in Massachusetts, putting one of the Commonwealth's most vibrant industries at serious risk. The most critical of our concerns are summarized below.

1. Foundational elements of the auction to establish initial base rates need to be addressed to ensure authentic participation and representative results.

Throughout the working group process, stakeholders spent significant time discussing how to set base rates that would maintain the momentum and success of solar PV development in Massachusetts while continuing to reduce costs and increase value to Massachusetts ratepayers. There was stakeholder consensus that market conditions should be considered in establishing initial capacity-based tariff rates. Several sources related to market conditions were discussed:

Previous versions of DOER proposals on program design used a detailed and comprehensive consultant report to establish appropriate initial base tariff rates, also aimed at setting fair and reasonable rates based on real market data.

The solar industry suggested setting the base rate consistent with solar costs recently approved by the Department of Public Utilities for Investor Owned Utility (IOU) projects, specifically the approved costs associated with Unitil's most recent competitive procurement. That procurement provided for an average \$/kWh rate of \$0.21 over the life of the project based on the approved construction costs in the October 2016 Settlement Agreement.¹

The current proposal from DOER to use an auction mechanism as the primary tool for determining incentive levels was first unveiled after the conclusion of DOER's stakeholder efforts, even though the amount of discussion on this specific use of a competitive solicitation was limited during the working group process. The solar industry remains strongly opposed to the use of centralized procurement in the SMART program for reasons that have been well documented and debated during the working groups.

However, we understand the pressures that have led to the inclusion of a single, limited procurement to establish the initial base tariff rates for projects over 1 MW. Rather than reiterating our opposition to the proposed procurement, we wish to provide constructive feedback to help ensure a robust process and, more importantly, meaningful and representative results.

Without appropriate parameters in place, we have serious concerns about the ability of the proposed auction to accomplish the objective of providing a reasonable indication of the base incentive requirement for solar projects in Massachusetts. And, because a single auction will determine the incentive levels for the entirety of the SMART program, the consequences of an unrepresentative auction result are severe. Several auction programs from the region provide ample evidence of the importance of designing auctions to discourage speculative bidding, promote confidence in the market,

¹ Unitil's procurement was most appropriate for setting base rates because it is the most recent procurement to date and Unitil's territory can be more costly to develop which makes it appropriately suited to establishing a ceiling price.

and account for the potential of project attrition.² We strongly believe that avoiding the potential disruptive risks of the auction results should be among the state's highest priorities in determining the final SMART program design, as it is suddenly the keystone of Massachusetts's next phase of investment into valuable solar capacity and jobs.

A full set of recommendations for conducting a successful auction process is included as Exhibit A of these comments, and we strongly encourage DOER to review our recommendations on how to ensure that the auction results take into account geographic differences in costs, including land, interconnection, and permitting. Below are three critical items that we believe must be addressed within the forthcoming Emergency Regulations.

Recommendation 1a: *Establish a ceiling and floor price based on market data that provide reasonable assurance to solar developers of a viable market while also providing an upper limit on ratepayers' cost exposure.*

In its January 31, 2017 presentation of the Final Design for SMART, DOER proposed setting the ceiling price for projects from 2-5 MW at the "base case" revenue requirement projection for medium-cost ground-mount projects, as calculated by DOER's consultant, Sustainable Energy Advantage (SEA).

This base case revenue requirement was developed using several aggressive assumptions - regarding development, interconnection, and the potential for cost declines over time - that are not indicative of the cost to develop in Massachusetts. For example, SEA did not use the median or mean of reported project and interconnection costs; rather, SEA used the average of the 1st (lowest) quartile of the high and low values for these costs, resulting in a starting assumed "average cost" for project development that is significantly lower than the average.³

In addition, SEA assumed an aggressive 9.6% year over year cost decline assumption in establishing the revenue requirements for its base case for larger (>1 MW) projects.⁴ This cost decline assumption is based on *national* projections, and therefore overstates the achievable cost declines in Massachusetts' relatively more mature solar industry. Moreover, SEA's revenue requirement calculations explicitly did not include the additional "dry hole" costs associated with a program design that incorporates competitive procurement.⁵ Finally, the SEA analysis did not take into account the potentially significant impact of the "greenfield subtractor" concept that DOER proposed in January. Inclusion of this

² For example, Connecticut's ZREC/LREC auction program has been plagued by low completion rates and award defaults, which have resulted in high levels of terminated projects (40% or more in some years). Similar programs, including New York's NY-Sun and Large Scale Renewables program, and several of California's distributed generation reverse auction programs, have experienced similarly high rates of attrition.

³ See SEA Analysis at 28 and 39.

⁴ SEA Analysis at 41-42.

⁵ SEA Analysis at 44; as SEA explains: "Developers bidding into the competitive bid portion of a market must incur in aggregate 1.5 "dry holes" for every successful project; 'dry hole' cost represents additional overhead compared to an open incentive program in which developers must make one sale per development / PPA contract. These 'dry hole' costs are more appropriately included in Task 1 as they add to incentives required by developers to participate in a market. Nonetheless we have included the 'dry hole' costs as part of Task 2. Due to the fact that SEA has added in the impact of administrative costs in the Task 2 ratepayer cost analysis rather than under Task 1 . . . the graphic above does not directly account for the added levelized system and incentive costs associated with the Hybrid CB/SO policy alternative that are unique to a structure based on competitive bidding." SEA Analysis at 44.

subtractor would further increase the revenue requirements for many of the greenfield ground mount projects used by SEA to determine its base case revenue requirements—from which DOER derived its proposed ceiling price.

While we appreciate and support DOER’s adoption of a ceiling price as one mechanism for protecting ratepayers from unrealistically high bids, both the concept and the actual level chosen by DOER presents two fundamental auction design issues.

First, in order to encourage industry participants to put the necessary development capital at risk prior to the auction, DOER must also establish a floor price. Absent this mechanism, the inability to quantify downside risk in the auction will lead to a significantly less robust participation, as many projects simply will not be willing to expend the capital at risk to develop a project to the point at which they can qualify to bid. Establishing a reasonable floor price will therefore generate more confidence in the auction, enabling industry participants to focus on projects that are feasible while limiting stranded investments.

Similarly, a ceiling price set at a rate below what is actually representative of market conditions risks severely limiting auction participation and the utility of an auction for true price discovery. Setting the ceiling price too low significantly increases the risk of an incomplete and below-market auction result, the effects of which would cascade through the entire SMART program. The use of the base case cost projection for medium cost projects to establish the ceiling price will, by definition, preclude more than half of all potential projects from responsibly bidding into the auction.⁶ In addition, by selecting SEA’s “base case” projection rather than the “high case,” DOER is ignoring the very real possibility overall project costs in Massachusetts will not decline as quickly as its consultants estimate – especially given that interconnection and other costs outside of our control are rising. Instead, DOER should use the high and low projections developed by its consultant to set a “collar” (i.e. a ceiling and floor) within which auction participants would be required to bid. The undersigned associations believe the following approaches would be the most appropriate:

- Use the midpoint between the low case and the base case and the high case and the base case for medium cost ground mounts. Using this approach, would yield a ceiling of 17.55 cents and a floor the of 11.35 cents; or
- Set the ceiling and floor prices at levels indicated after removing the upper and lower quartile of project costs.

Recommendation 1b: *Establish clear guidance limiting the initial competitive procurement to a buy-all, sell-all rate for standalone facilities.*

The stated purpose of the competitive procurement is to set a base incentive rate for projects > 1 MW from which projects < 1 MW will be indexed. As currently proposed, the competitive procurement to set base rates would include projects that are eligible for adders in addition to the base rates, including four location-based adders, four offtaker-based adders, and one technology-based adder (for projects with storage). If any one of these adders – or the interplay of multiple adders for a project that could stack location-based, offtaker-based, and/or technology-based adders does not match the incremental

⁶ More than half of all projects will be excluded because, as noted above, SEA’s analysis did not use the mean of project and interconnection costs. Rather, by averaging the 1st quartile of its high and low project cost data, SEA chose projects and interconnection costs that are in the lower half of actual results, effectively excluding more than half of all potential “medium cost” projects.

cost(s) associated with its project category(ies) – this could skew the results of the competitive procurement. The end result could be a base rate that will not adequately support diverse solar development. The impact would flow through the remaining indexed rates and program blocks and, ultimately, lead to insufficient market development and/or one that lacks the diversity which the legislature and DOER seek to support.

To ensure that the auction reveals the “true” initial base tariff rates, DOER should limit the initial competitive procurement to projects over 1 MW that are not eligible for adders. At the same time, in order to address the equity concern of projects eligible for adders not having access to the competitive procurement, DOER should set the capacity of Block 1 at 200 MW and limit participation in this first block to projects that are otherwise not eligible for the auction, including projects less than 1 MW and adder-eligible projects of any size. The remainder of the program would, of course, be fully available to all types of projects.

Recommendation 1c: *Establish threshold eligibility criteria that are consistent with the level of project maturity needed to participate in the future program blocks, and include a mechanism for a non-refundable deposit to ensure awarded projects move forward.*

To achieve meaningful results, the initial solicitation must: i) discourage speculative bidding, ii) minimize the likelihood of project attrition, and iii) ensure that projects are developed in a similar timeframe as other DBI projects.

To this end, DOER should establish the following eligibility criteria for the price-setting auction:

- A project must demonstrate that it has achieved minimum development milestones:
 - Site Control
 - Non-ministerial Permits
 - Executed ISA⁷
- Selected projects must accept the auction award and make a payment equal to 25% of ISA costs to the appropriate utility within 10 business days of award notification (such 25% ISA payment shall also serve as a non-refundable Performance Deposit).⁸
- Any excess capacity resulting from bid attrition (i.e., failure to accept) should be awarded to the next project(s) in the bidder queue, with the above process repeated until full auction capacity has been accepted. The final project selected should set the clearing price.

2. The percentage decline between blocks must be responsive to and reflective of changing market realities.

Recommendation 2a: *Establish the baseline inter-block decline rate at 3% and allow for DOER to reduce the rate of decline if market development is outside a pre-determined collar.*

In DOER’s September 23, 2016 proposal, the inter-block declining rate for the base incentive level was set at 5%. In response, the solar industry and other stakeholders submitted comments expressing our concern about the proposed rate and emphasizing the need to set this rate at a percent that properly

⁷ Does not necessarily need to be countersigned by utility.

⁸ DOER should consider requiring a separate and additional Performance Deposit (e.g. \$5/kW (AC)), refundable upon Mechanical Completion, to further ensure developer confidence in participating projects.

reflects market conditions, including realistic expectations regarding cost declines, and ensures the long-term sustainability of the solar program. In response, DOER proposed a declining rate at 3% during the working group discussions, before ultimately settling on 4% in the SMART proposal.

While we appreciate DOER's willingness to reconsider its original declining block rate, we believe the current 4% proposed decline will not lead to a sustainable program. First, the use of an auction to establish base rates protects DOER from setting initial tariff levels at above market rates. Therefore, the percent decline is only needed to encourage future cost declines within the industry. Importantly, as the Massachusetts market has matured, a growing percentage of in-state project costs remain relatively flat (e.g., labor costs, which can make up ~50% of total project costs) or have risen steadily (e.g., interconnection costs, rooftop lease rates).

The recent experience curve for the solar industry shows that for every doubling of capacity there is a roughly 20% decline in costs. Furthermore, recent industry forecasts through 2020 predict solar capital cost reductions ranging from approximately 1.5-3% per market segment during the expected life of the new incentive program. A 3% reduction between blocks would yield an approximately overall 20 percent reduction in incentive levels and is more consistent with industry trends.

Additionally, there are forces beyond the control of the Massachusetts solar industry that could significantly impact our ability to drive down costs as quickly as DOER would require, including potential changes to the Federal Investment Tax Credit, increases in inflation and interest rates, the imposition of additional import tariffs on solar equipment produced overseas, or ever-increasing interconnection costs.

Recommendation 2b: *Do not subject adders to the % decline between blocks.*

In addition to a 4% decline in the base incentive rate per block, DOER also now proposes that adders will also be subject to a 4% decline per block.

While it is the case that overall solar costs have come down, the reduction has been largely limited to equipment and certain balance of system costs. Similar reductions have not been realized in most of the cost categories of projects for which adders apply. For example, landfills, community solar, low-income and municipal projects have higher site development and/or customer acquisition and administrative costs than standard project that do not qualify for adders, and there is no reason to believe these costs will diminish over time, let alone at a rate of 4% per block (roughly 6-8% per year, assuming 1.5-2 blocks per year).

Given that many of the costs associated with adders will be steady or even rising over the life of the program, DOER's proposal to reduce the value of these adders with each block will make adder-based projects less and less viable during each phase of SMART—a result that appears to run contrary to the intent of the legislature in directing DOER to establish a next generation solar incentive program. Furthermore, the same is true—in reverse—for the proposed land use subtractor (discussed further below). In contrast to the adder categories, DOER should clarify that this subtractor will also decline along with base rates. Failure to do so would increase the penalty in the subtractor relative to the remainder of the program, further exacerbating the impact of this new policy.

Projects that are eligible to receive adders are those that the legislature, the Executive Office of Energy and Environmental Affairs (EEA), and DOER have identified as supporting particular public policy

objectives. Subjecting adders to a declining rate will have a detrimental impact on the long-term feasibility of those projects, and therefore work to defeat the public policy purpose of the adders.

Recommendation 2c: *Revisit capacity based rate factors for all projects and set a formula that would support a successful, sustainable program.*

The SMART program is designed to align incentives for different solar market segments and project types. This is done through the capacity based rate factors, linked to the auction clearing price. The industry is concerned that not all capacity based rate factors are set at appropriate levels. For example, under 25 kW and the under 25 kW low-income, typically residential projects, have the highest installation costs (in dollars-per-watt terms) of any solar market segment.

Many of our firms remain concerned that the proposed 200% capacity based rate factor is insufficient for projects under 25 kW because (1) the tariff contract value is 10 years compared to 20 years for all market segments, and (2) it costs about twice as much (in dollars-per-watt terms) to install compared to projects 1-2 MW in size. The capacity based rate factor may need to be higher to account for project cost differences, and set a formula that would support a successful, sustainable program for projects under 25 kW. In 2016, more than half of new solar capacity consisted of projects under 25 kW. Properly calibrating the capacity based rate factors for all categories will be crucial to maintain the workforce growth and investment that Massachusetts has historically experienced with the solar industry.

3. Balance the proposed land use subtractor and performance standards with the objective to continue to support solar development of all market segments.

In an effort to reduce the number of trees cleared and the amount of residential-zoned land impacted by the development of solar PV, DOER has proposed the use of performance standards and a subtractor for ground-mounted projects based on zoning criteria and the existing use of the land. The solar industry supports and, in the vast majority of cases, practices proper land management and site mitigation planning. As we have indicated in previous correspondence and discussions, we, as an industry, have promoted and developed projects that minimize the impacts on the soil and land, enable the production of local, clean renewable energy, and are temporary in nature, especially when compared to development that may otherwise take place on these sites. We have several recommendations to better balance DOER's proposed land use subtractor and performance standards with the objective to continue to support solar development of all market segments.

Recommendation 3a: *Clearly define "acres impacted" and "previously developed".*

In setting the subtractors in SMART, it is important for DOER to consider the total impact of the new program and move expeditiously to develop guidelines, in consultation with appropriate parties, to define "acres impacted" and "previously developed." Without such definitions, the "subtractor" rate cannot be prudently set.

Recommendation 3b: *Amend categorization of projects subject to subtractors.*

We recommend amending the categorization of projects subject to subtractors to be consistent with the stated intent of the land use and siting criteria introduced under the SMART Program.

Any project zoned specifically for solar/power generation, regardless of whether it has been previously developed or not, should be placed in Category 1 and be eligible for the full base tariff. Local jurisdictions that have gone through the time and effort to identify and zone an area as appropriate for solar/power generation development should not be penalized for their forethought and planning by subjecting projects in these areas to a subtractor. The local communities that have created solar/power generation zones have already, through a public process, expressed their support for this type of development in these specific areas. Subjecting these solar-zoned areas to a subtractor could negatively affect these jurisdictions' ability to attract the very type of development they are seeking through their prior zoning determinations. Similarly, since zoning is not uniformly indicative of the permissible development uses, any project on land ultimately deemed "previously developed" under the SMART program should fall under Category 1 and receive the base tariff.

Recommendation 3c: *Reduce the amount of the subtractor to \$0.0005/acre for ground mounted systems not on C&I and to \$0.00025/acre for ground mounted systems on C&I not previously developed.*

The impact of the proposed subtractors on the development of new, cost-effective solar projects is likely substantial and could have the perverse effect of signaling a disincentive for optimal system design.⁹ Moreover, the fixed subtractor will have an increasingly negative impact on project economics with each subsequent block.

Accordingly, if DOER includes a subtractor in its regulations as proposed, the solar industry respectfully requests that the rates be set such that they fulfill the stated public policy objectives yet reasonably enable ground mounted projects that meet the new land use performance standards to continue. Based on our reasonable assumptions about the definitions referenced above, we propose the following subtractor rates:

Project Type	Ground Mounted, not C&I Zoned, and NOT Previously Developed	Ground Mounted, C&I Zone, and NOT Previously Developed	Ground Mounted, C&I Zoned, or Previously Developed
Compensation Rate \$/kWh	x – \$0.0005/acres	x – \$0.00025/acre	Base Rate

Recommendation 3d: *Grandfather projects that have received site/development permits prior to the implementation of SMART from the new program's subtractor and land use performance standard requirements.*

An additional concern is the impact that the land use subtractor and performance standards will have on projects at advanced stages of development, including those currently in the permitting process prior to the implementation of SMART. Solar developers and project investors are required to commit funding at an early stage in the development process in order to secure the necessary entitlements for a project to

⁹ For example, higher tilt systems require more space, but would face greater penalties than lower-tilt systems.

proceed. That process must be timed with the anticipated construction schedule and coordinated with the applicable incentive programs. Timing is therefore critical. Subjecting projects currently undergoing permitting (which are naturally following existing land use standards and requirements), to new land use performance standards/subtractors that will not be implemented until 2018 unreasonably harms such projects.

Accordingly, we urge DOER to grandfather any projects that acquire all non-ministerial permits prior to the implementation of SMART from the subtractor and land use performance standards of the new program.

Furthermore, DOER should adjust the auction "clearing price" if a land-use grandfathered project sets that price, because an equivalent project in the new program would face a land use subtractor, such that the clearing price based on a grandfathered project will not result in an apples-to-apples comparison and will undervalue the incentive needed to make an equivalent project viable. The project should still be awarded its bid price, but DOER would administratively adjust the "effective clearing price" upward by the amount that the project would have been required to pay had it been subject to the subtractor.

Recommendation 3e: *Clearly articulate the objectives of the performance standards.*

Throughout the land use working group discussions, support for incorporating performance standards was widespread. Yet, some of the proposed performance standards, i.e., specifying equipment type, included in DOER's January 31, 2017 presentation seem overly prescriptive without specifying the objective. In some cases, or for some locations, the proposed restrictions on equipment and materials could drive up costs without a clear benefit. Furthermore, referencing specific equipment and materials could prove obsolete in the short-term given the evolving state of the industry. Instead, we suggest that DOER be clear about the objectives of the performance standards and less prescriptive about the specific types of equipment, while also ensuring that the price ceilings/floors account for the potential increase in costs in order to meet the performance standards.

4. Conclusion

We appreciate all of the hard work and thought that EEA and DOER have put into developing the SMART program. Many of the features of this new solar incentive program reflect the dialogue produced by the working group process, meetings and public comments filed by stakeholders – including the solar industry. The objective from the beginning, as expressed by the Baker Administration and the legislature, has been to develop a successor solar incentive program that is sustainable over a longer period than the existing SREC program, that expands access to more citizens, and that continues to reduce costs to ratepayers and consumers. Much of what has been proposed sets Massachusetts on a path to achieve this objective. However, important issues raised in these comments, regarding the fundamental structure of the competitive procurement design, the declining base tariff level and adders, and land use considerations need to be addressed before issuance of the Emergency Regulations in order for SMART to meet its overarching goals.

Thank you for your time and consideration of these comments and our recommendations. We look forward to continuing the positive solar momentum in Massachusetts and ensuring that it remains a national leader in clean energy.

Your sincerely,



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