

January 29, 2014

Mr. Michael Judge  
Department of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston, MA 02114



Dear Michael:

Avid Solar is grateful for the emergency regulation that helped to sustain the solar industry in Massachusetts while allowing DOER time to develop a successor SREC program. Unfortunately, the pressure to quickly implement SREC II to avoid extending the emergency regulation or causing the industry to halt installations has led to a proposal that has not, in the opinion of Avid Solar, addressed the most significant weaknesses of the SREC incentive program: (1) the significant uncertainty—and thus risk—of the incentive value, and (2) the complexity of the incentive program, making it extremely difficult for the average citizen—and installer—to understand and comprehend how it works. The complexity of the program and the uncertainty of the future value of the SREC revenue combine to generate significant risk in the eyes of potential PV system investors. Lowering the perceived risk could allow DOER to significantly lower the incentive levels required to induce investment, lowering the cost to ratepayers. It also could significantly lower the soft costs of promoting and installing solar in Massachusetts. Avid Solar estimates that this risk premium equates to nearly 30-40% of the expected SREC costs built into DOER's projections regarding the expected cost of the program. In other words, the same level of development could be induced at a much lower total program cost if this perceived risk was reduced or eliminated. This represents the greatest opportunity for improving the proposed program design, and Avid Solar offers some feasible suggestions to realize it.

Avid Solar's comments will address 3 key concerns regarding the SREC II program design, offering suggestions for improvement in each area. Additionally, Avid Solar offers suggestions to DOER regarding the need to attend to several additional issues that could significantly affect the development of solar in the near future, and we encourage DOER to immediately take the lead in addressing those issues. Avid Solar has organized its comments into the following four topic areas:

1. **The proposed rulemaking does not adequately reduce the perceived risk of the SREC incentive**, which will result in higher program costs and PV "soft costs," while creating an advantage for sophisticated 3<sup>rd</sup>-party investors vs. MA-based owner-investors.

2. **The proposed rulemaking does not adequately incorporate into its SREC factors the benefits of depreciation tax deductions** in the cost recovery and return on investment available to certain PV system owners, skewing the proposed SREC program to favor PV investments made by businesses and 3<sup>rd</sup>-party investors.
3. **The proposed approach to Managed Growth constrains a unique opportunity to allow the federal government to contribute 30% of the cost of PV development in Massachusetts** by restricting PV development during the last few years of the 30% federal ITC, set to expire on December 31, 2016. Instead, Avid Solar suggests that Massachusetts take full advantage of this 30% cost sharing by the federal government.
4. Net metering caps are already being reached, threatening to bring solar development to a rapid halt, and the overall RPS goals are being achieved more quickly than expected thanks to the significant cost reductions in renewable installations—which are expected to continue. The momentum of renewables development in MA will be severely constrained if DOER, the DPU and Legislature do not act quickly to address net metering and RPS constraints. **An updated, more sustainable and comprehensive strategy for the development of renewables in Massachusetts is urgently needed** to avoid more “emergency rulemaking” and stop-gap legislation required to keep pace with the rapid development and improved economics of distributed renewable generation.

## **1. DOER and/or the Legislature Need to Further Reduce SREC Risk**

The proposed rulemaking does reduce SREC risk for the SREC II program, but not nearly enough. Specifically, the ability for DOER to manage the opportunity to develop large systems on an as-needed basis to meet established annual capacity goals has the effect of simultaneously establishing a tight band of expected SREC supply. Given that DOER also sets annual SREC demand levels (formulaically), it has the ability to keep the supply and demand or SRECs roughly in balance, and to tweak the demand and supply in response to years of shortage or oversupply (e.g., in response to an auction that does not clear) to ensure that the markets will likely clear in subsequent years. Avid Solar expects, as a result, that the average SREC II expected value will trend closely around the auction price...if the SREC programs and markets in MA were not so volatile, complex, uncertain and difficult to model and understand. Instead, trading in the SREC II market, which has already begun, has inherited much of the perceived risks associated with the SREC I program. This is benefitting Wall Street traders and speculators/arbitrageurs. At the same time, most potential PV system owners—other than sophisticated developers and 3<sup>rd</sup>-party investors—continue to be unable to comprehend how the market will work and how to determine the expected value of an SREC. It is even beyond the capability of the average installer in Massachusetts. Because of the complexity and uncertainty of potential SREC revenue, most banks will not lend against its value either, make it considerably more expensive to finance PV installations in Massachusetts.

Wall Street, on the other hand, seeks markets characterized by complexity and information asymmetry as opportunities to make trading profits. The MA SREC market has attracted their attention. Currently they are offering potential system owners who would participate in the SREC II program about 50% of the auction price for the future value of their SRECs during the first five years of the program, despite DOER's enhanced tool set for keeping SREC II supply and demand in balance. The difference between the guaranteed price offered by arbitrageurs and the likely selling price represents a profit that will likely flow to NYC, not MA-based investors in solar PV systems.

If DOER could further reduce the perceived risk in the future value of SRECs, it could actually lower both the auction price and alternative compliance payment rates over the project program life—*significantly*—while still inducing the same level of investment in PV systems. Moreover, the SREC revenue would more likely remain in Massachusetts instead of being siphoned out of state by market arbitrageurs. Avid Solar believes that there are at least a couple of ways that DOER could significantly lower the perceived SREC price risk: one that it could implement on its own, and one that would require the support and action of the Massachusetts Legislature:

**A. Create a price collar for small systems owned by MA self-generators.**

In its April 8<sup>th</sup> comments, Avid Solar suggested that one means for DOER to minimize the uncertainty and volatility around SREC prices for small system owners would be for DOER to provide an option to purchase SRECs from them at a certain price point, for example at 95% of the auction price, if the small system owner was not able to sell the SRECs for more in the spot market and if they did not want to take their chances in the clearinghouse auction (or, perhaps, could not wait that long). Rather than retire the SRECs, DOER would build an inventory of SRECs that it would sell when the spot market rises, perhaps being required to sell when the price reaches a certain point, for example 105% of the auction price. In essence, DOER would act as a 'shock absorber' in the market, dampening price volatility due to under-supplied and over-supplied markets. This would benefit not only the small system owners that are eligible to trade with DOER, but also the entire market through the reduction of price volatility and uncertainty. DOER could also monetize its position in the clearinghouse auction.

DOER would need capital to establish its trading position, and it has a significant PV ACP account balance to do just that, despite its purchases in last summer's auction. If needed, as the program scales as more systems are installed under SREC II, its capital position could be further augmented by future ACP payments expected from the SREC I program and by CEC funding from the RETF that has otherwise been funding the CS II program, scheduled to end as the new financing scheme is put into place. The ongoing operational expense of the DOER trading position—which could be outsourced to existing aggregators—could be funded by the spread between the purchase and sales prices of its SRECs while keeping the

principal in the capital account intact—i.e., it is a sustainable risk reduction program.

If the market, including banks, were confident with DOER acting as counter-party to future SREC sales, there may not be any need for an additional, subsidized financing program for small system owners. If there was greater assurance around the expected value from SREC sales, the lending market will likely respond to help finance it.

Avid Solar recommends extending the price collar for PV system owners that consume at least 67% of their power onsite for systems up to at least 100 kW in size. Avid Solar also suggests explicitly recognizing ‘solar garden’ collaborative participants as eligible system owners, also, as long as the system they own is scaled to meet approximately 100% of what they consume remotely, and that their consumption is not already being offset by self-generation.

## **B. Pass H.2915 (the “Calter Bill”) in the MA Legislature**

The legislature has been ruminating over H.2915, which would ensure that SREC auctions clear at the auction price, for the past year. If the Joint Committee supports it and it passes into law, it would eliminate the risk for all market participants that SRECs would sell below the auction price in Massachusetts. This would substantially offset the perceived risk and significant angst in the market regarding the future value of SRECs in both the SREC I market and the SREC II market. It would create a bankable floor price over the entire 10-year life of the SREC program. This would be the simplest and easiest means of reducing SREC uncertainty, and Avid Solar strongly recommends it.

Furthermore, if there were greater certainty regarding the minimum SREC incentive value, the proposed auction clearing prices—and their complementary ACP prices—could be substantially reduced, lowering the total program cost to ratepayers. Currently, potential investors heavily discount the expected value of the SREC revenue stream when evaluating their decision to invest in solar due to the uncertainty of SREC pricing and market signals that suggest they could be very low in the future. In other words, investors currently project the future value to be discounted significantly, typically in reference to the auction price. If there was certainty regarding the auction floor price, the actual floor price could be lowered without affecting the amount of investment induced by the incentive.

The cost of capital for solar investments would also be reduced if lenders perceived the SREC revenue stream as more certain. This also allows the required incentive value (i.e., the floor price) to be lowered, all else equal.

The soft costs incurred in selling solar would also be lowered, allowing installers to lower the cost of systems. Currently, the most challenging aspect of selling solar is not explaining the technology; it is explaining the SREC incentive program and helping potential investors to reach a level of confidence that a sufficient level of projected SREC revenue will likely be realized, and on a timely basis.

Passage of the Calter Bill would lower the cost of solar, lower the cost of the solar incentive for ratepayers, make financing solar easier and more affordable, and address the greatest weakness of the SREC incentive program: the price risk and complexity inherent in the program. Avid Solar encourages the Joint Committee to recommend passage of the Bill, on its own, and move it to the legislature for a vote immediately. Ideally, this would be before the SREC II regulations go into effect, and would allow for a re-setting of the price levels for the ACPs and auctions.

Avid Solar does not believe it is necessary to extend these risk-reduction benefits—either the price collar or the Calter Bill auction price support—to 3<sup>rd</sup>-party system owners, although it may be simplest to extend the Calter Bill provisions to all market participants, in both the SREC I and SREC II programs. Like the Wall Street banks that fund the tax equity, loans and bonds for the 3<sup>rd</sup>-party system owners' portfolios of PV systems, the 3<sup>rd</sup>-party developers have the sophisticated financial modeling skills and market knowledge required to assess the risk and expected value of SRECs in Massachusetts. In order to balance the playing field, DOER needs to either reduce the risks for all by significantly overhauling the SREC program (not likely possible), or press the Legislature to pass the Calter Bill, or modify its SREC II proposal to meet the needs of certain market segments that are disadvantaged by its inherent complexity and its perceived risk. Pragmatically, Avid Solar suggests the latter approach if the Calter Bill passage is not expected soon, and believes that DOER has the authority and funding to implement the price collar mechanism for a limited segment of the market. Given that Massachusetts benefits most from investment in distributed self-generators owned by the consumers of the solar electricity generated (see the Task 4 Report), Avid Solar recommends focusing on meeting the needs of that segment, first—i.e., the segments least likely to have the skills required to model the complexity of the SREC program.

## **2. Adjust the SREC factors to account for the significant economic benefit provided to businesses through depreciation tax deductions**

In Avid Solar's April 8th comments on the SREC Factor concept as originally proposed by DOER, we noted the importance of depreciation tax deductions to the economics of solar investments made by businesses. Residents and non-taxable organizations do not receive that form of cost recovery for their PV investments. Avid Solar believes that entities that cannot deduct depreciation expense from their taxable income should receive a higher SREC factor.

DOER has chosen to vary the SREC factor to account for the different economics for various segments of the market, to favor distributed generation that is consumed on site, and to promote the development of PV systems on land that otherwise has low development value or alternative uses. Beyond land use differences and on-site consumption, the various sectors' SREC factors appear to differ based on the size of the system (scale). DOER probably took other incentives available to various sectors into consideration, but it does not appear to have had much impact on their proposed SREC factors. Avid Solar believes the existence of these other incentives create significant economic advantages that should be more fully considered and reflected in the proposed SREC factors.

In order to better understand the economics of solar development, DOER tasked several consultancies to examine several questions and report on the economics of solar from various perspectives. Unfortunately, Avid Solar believe that DOER was not adequately informed about several key incentives and practices available to only certain market sectors that make a significant difference in the economic returns for those market segments. If DOER is trying to use SREC factors to help level the economic playing field and favor certain types of development that most benefit Massachusetts, Avid Solar believes that a few of these factors deserve closer examination and consideration.

The Task 1 Report ("Evaluation of Current Solar Costs and Needed Incentive Levels Across Market Segments"), was a foundational report for the other consultant studies. Unfortunately, it contained some fundamental flaws in its analyses, and the policy implications were erroneously skewed as a result. In the small system market segments, its analysis was not only flawed, but it suggested a policy response that was the absolute opposite of the market reality: small, individually-owned systems require less incentive to persuade them to invest in PV due to superior returns on investment than the largest solar farm developer. In essence, it suggested that solar farm developers should have a higher SREC factor than residential systems owned by the resident. This is opposite the case.

At the same time, and inexplicably, the report failed to show the after-tax net cost of a system based on all incentives to the various segments it studied and modeled. If it did, it would have shown that non-profit organizations have the highest net cost, residential systems are the next most expensive segment, then small commercial, then large commercial and finally large solar farms. There are several reasons why this is the case:

- A) **Depreciation tax deductions**, assuming a 40% combined (fed and state) tax rate, offer up to a 34% *recovery* (40% tax rate x 85% basis after the ITC) of the system cost after 5.5 years.
- B) **Larger systems costs less per watt to install than small systems** due to the purchasing discounts on larger orders, labor and material efficiencies, and certain fixed and administrative costs that do not scale linearly with the size of the system. The cost advantage can be one-third the cost per watt relative to an average residential system. In other words, before we start applying the 30% ITC and the

34% depreciation benefit, they installed cost can be about one-third less than a residential system on a per watt basis.

- C) **Third-party owned systems have most likely stepped up the tax basis** of their systems through the creative use of leases—a completely legal and well developed practice in the development of solar projects. (The high-cost, consistently priced systems in the DOER installed cost database discarded by the consultants were evidence of this practice.) In other words, even if a system was installed at a cost of \$5.00 per watt, the lessor that owns the system can use Fair-Market-Value lease accounting to claim that the tax basis should actually be \$7.00, for example. Therefore, the 30% ITC will be \$2.10 (30% x \$7.00), and the depreciation tax deductions would be \$2.38 (34% x \$7.00). After tax benefits, the 3<sup>rd</sup>-party owner has a net out-of-pocket cost of only \$0.52 (\$5.00-\$2.10-\$2.38). In the residential market, the CEC also allows 3<sup>rd</sup>-party system owners to claim the CS II cash rebate as a small commercial system owner. In the end, the 3<sup>rd</sup>-party could have a net investment after incentives of less than \$0.50 per watt...before charging the homeowner for electricity sales or collecting any SREC incentives.

In contrast, a residential owner of the same system paying \$5.00 per watt to own the system would have a net after-tax cost of \$2.74, assuming that they were able to claim both the MA residential tax credit *and* assuming they qualified for the \$0.40 adder to qualify for a \$4,000 Commonwealth Solar II cash rebate.

The Task 1 report opted to ignore the standard practice of stepping up the tax basis for 3<sup>rd</sup>-party owned systems, even though it has a significant economic impact on the financial returns for system owners. Doing so significantly decreased the value of the reports findings. It contributed directly to the skewed suggestions that a residential system owner, with an after-tax cost basis of \$2.74 after incentives, required a substantially lower SREC factor vs. the 3<sup>rd</sup>-party owner of the same system who likely has an initial after-tax cost basis of less than \$0.50 per watt (*and possibly less than \$0.00*).

Another economic advantage of larger ground-mounted systems is that they are optimally oriented to maximize PV generation. In other words, they generate greater electricity kWh per watt of capacity installed, and, therefore, more SRECs over the 10-year SREC period (and ensuing Class I REC period), further enhancing their return on investment. As a result, they can achieve a reasonable return on investment with a relatively lower SREC factor. The Task 1 report did correctly incorporate this difference into their modeling.

The Task 1 Report made a critical error, however, in its establishment of the required rate of return for residential system owners. Although Avid Solar participated in the survey of market participants that was used, in part, as input to the Task 1 Report, it is unclear to us why the consultants chose to construe certain costs of funds as proxies for the required rates of return for solar project investments by various market segments. For 3<sup>rd</sup>-party developers, the cost of funds directly reflects the required rate of returns for solar project

development; it was okay to equate the cost of funds with the required rate of return of those project. Using the QE2-subsidized, historically low financing rates for residential mortgages, however, does not serve as an adequate proxy for what residential system owners require as a rate of return on a solar project. To wit, we have never sold a PV project with only a 4% IRR to anyone. For a first-time solar investor, like a homeowner (or even a small business owner), the perceived risks associated with both a new and rapidly changing technology, as well as with a complicated and volatile set of incentive schemes required to achieve an attractive return on investment, does not come across as an investment that is safer than US Treasury Bonds. Suggesting as much in the Task 1 Report is ridiculous.

Avid Solar recommends that DOER substantially increase the SREC factor for residential and non-profit owners of PV systems that cannot claim depreciation tax deductions. Rather than cram down all of the other factors as proposed, Avid Solar suggests allowing these 2 segments to apply an SREC adder to the currently proposed factor of 1.0, allowing the residentially-owned systems and non-profits to have SREC factors that exceed 1.0. Avid Solar believes that an adder of 0.25, at a minimum, is needed to balance the scales between system owners that can claim depreciation tax deductions and those that cannot. Note, an adder of 0.25 assumes that the Commonwealth Solar II cash rebate programs *remains* in place after SREC II commences or that similar value is offered to residential owners in the form of a loan subsidy. Without that additional Commonwealth Solar subsidy for small system owners, the adder would have to be higher to balance the benefit of depreciation tax deductions.

Avid Solar welcomes the opportunity to meet with both the CEC and DOER staff, as well as with legislators and their staff, to further examine the economics of solar and the various economic models for different segments. We strongly encourage you to reach out to market participants, and not just depend on the consultant reports, to better understand the actual economics of solar and the realities of the investment decisions that potential system owners are struggling with today.

### **3. The proposed approach to Managed Growth constrains a unique opportunity to allow the federal government to contribute 30% of the cost of PV development in Massachusetts.**

Constraining PV development during the last few years of the 30% federal ITC, set to expire on December 31, 2016, is a serious mistake, in the opinion of Avid Solar. Currently, Massachusetts is a “donor” state to the federal budget, paying more in taxes to the U.S. government than it receives in payments from all federal sources. Investment in solar PV in Massachusetts has leveraged more than \$500 million of federal tax credits to date, and while some 3<sup>rd</sup>-party investors have taken their tax credits with them, many of those federal dollars remained in the Massachusetts economy. If DOER helps to induce more Massachusetts residents and businesses to invest in their own solar PV projects, the Commonwealth could easily pull in another \$500 million in federal funding before the end of 2016, before the tax credit expires. The additional induced economic activity from injecting \$500 million from



out-of-state into Massachusetts would further reward the Commonwealth for its investments in renewable solar energy.

As DOER developed its Managed Growth formula, it developed a simple, linear model to establish annual growth targets that were easily defined formulaically. It is a straw model that deserves consultation with the industry to better understand how to maximize value for ratepayers and taxpayers alike. Avid Solar strongly suggests that DOER accelerate the development of solar to take advantage of the ITC while it is still available, although we do not have a specific recommendation on how much development should take place each year in the managed growth sector. At a minimum, we believe it should be double the proposed amounts. Please keep in mind that the ITC effectively lowers the cost to Massachusetts citizens to invest in solar, while also bringing dollars from outside the state's borders into its economy. While Avid Solar does not have access to a regional economic model to demonstrate the benefits to the state more completely over the next 7 years of accelerating investment, it is intuitively clear.

Avid Solar recognizes that this may lead to a smaller PV market after 2016 if the state limits solar PV development under the SREC programs to 1600 MW. We believe that it is more important and beneficial to the Commonwealth to take advantage of the federal incentives than to worry about how to incentivize solar PV investments after 2016. Indeed, Avid Solar would prefer to progress sooner-than-later to a separate and more comprehensive strategy for the development of all renewables in Massachusetts, which leads to our final topic of discussion.

#### **4. A more comprehensive, long-term strategy for the development of renewable energy resources in Massachusetts is needed...urgently.**

Massachusetts need to develop a fact-based analysis of the value of renewable energy and the full costs of fossil-fuel powered energy sources, and develop a more comprehensive strategic plan for the transition to sustainable energy in light of the accelerating momentum of renewable energy development due primarily to improved economics that cannot be easily constrained by regulators.

Currently, we seem to be jumping from fire to fire regarding the development of solar PV. First, the net-metering caps required a system of assurance as the caps approached...and then were raised. Then we needed an SREC system of assurance to help queue the growing demand for solar PV development. Then we required emergency rules to prevent a grinding halt for the nascent but rapidly growing industry. Now we are working towards SREC II. Meanwhile, we are already reaching the Net Metering caps, again. If the net metering constraints do not receive urgent attention and adjustments, it could also cause the solar PV industry (and other distributed generation) to suspend all activity within the next year or so. This firefighting takes a toll on everyone, and hurts the development of renewable and distributed generation in Massachusetts.

Some policy makers suggest that we have to “save the solar industry from itself,” by, among other things, throttling its growth. Others in the industry bristle at such comments and lament that the policy makers are hopelessly behind the market, out of touch with the market’s realities, and corrupted/confused by the lobbying of incumbent energy interests who are trying to fight back against the inevitable changes taking place in their industries instead of trying to better position themselves to take advantage of these overwhelming forces altering their industries’ market realities.

While it is important for the solar PV industry to recognize that it is not the only sustainable energy solution available, the policy makers, regulators and incumbents need to recognize that the pace of solar development is accelerating, and is unlikely to level off any time soon. Fighting its momentum, trying to constrain its development, would be as foolish as fighting back a rising tide. It is a global movement that Massachusetts cannot control, but Massachusetts can certainly benefit from it...and create the conditions to maximize that benefit through a better, more comprehensive and long-term strategy for the development of renewables that far exceeds the net metering caps in place, today, and the slow, linear growth in RPS percentages placed into legislation.

The size of the installed solar PV base, globally, is likely to double approximately every 3 years for the foreseeable future. With that growth will come technology innovation and increased economies of scale that will dramatically lower the cost of solar PV, contributing to an increasing pace of development, not linear growth. Here is an interesting fact that was revealed last week to demonstrate the global momentum of solar PV: in 2013, alone, China installed more solar PV than the United States installed...ever (i.e., cumulatively, to date). China intends to match that level of development this year. We should all be grateful for the pace of China’s PV development, because it is accelerating the rest of the world down the PV cost curve faster than we ever expected.

Massachusetts needs to do a much better job of planning for a future with a lot more solar PV and more renewable energy resources of all kinds, regardless of whether another natural gas supply pipeline is built to serve the state. Massachusetts needs to move beyond throttling solar to linear growth, and, instead, plan for exponential growth of distributed generation. We are woefully unprepared. Let’s move beyond the SREC discussion, and create a sustainable energy strategy that reflects this inevitability of cost-effective, renewable distributed generation...forever. It is coming sooner than you think. Let’s be the state that leads. It will benefit us all.