

VIA ELECTRONIC FILING

October 28, 2016

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

Re: Next Generation Solar Incentive Straw Proposal

Dear Mr. Judge:

Stem, Inc. offers the enclosed comments regarding the Next Generation Solar Incentive Straw Proposal presented by the DOER on September 23. As the national leader in energy storage for businesses, Stem feels well qualified to advise on appropriate incentive design to spur the deployment of intelligent energy storage in Massachusetts.

We are happy to answer further questions and offer advice from our extensive experience in this nascent industry.

Respectfully Submitted,



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COMMENTS OF STEM INC.

Stem applauds the DOER for clearly recognizing the benefits that energy storage can bring to Massachusetts ratepayers and how the technology can play a crucial role in the evolution of the state's solar energy market going forward.

The State of Charge report provided solid, impressive numbers for the benefits of energy storage in a variety of applications and the recommendations helped specify policies to fit the different use cases, including solicitations, incentives and market design changes. For the use cases where solar PV generation is co-located with energy storage (aka solar+storage), Stem agrees that it is appropriate to implement policies within a solar incentive mechanism. The Next Generation Solar Incentive Straw Proposal ("the Proposal") provided a good list of how storage can greatly enhance the benefits of solar deployment. Addressing those benefits here can accelerate the capture of those benefits while the storage policies that arise from the State of Report should focus on the benefits of standalone storage regardless of energy generation.

These comments discuss the practical considerations in designing an incentive that will result in customers adding energy storage to their solar PV installations. Stem's primary market at this time is California and so our most relevant experience comes from California based policies and programs.

About Stem

Stem is the national leader in developing, owning and operating grid-connected intelligent energy storage systems for businesses. Stem systems are installed and interconnected at customer sites behind the utility meter and utilize advanced analytics to charge and discharge the storage devices for optimal economic benefit. With the industry's largest contract for aggregated energy storage systems and as the first energy storage aggregator to participate in California's real time wholesale energy market, Stem is breaking new ground in realizing the full potential of distributed energy storage to provide valuable grid services.

Incentive Design

Stem recommends that within the context of designing a solar incentive, the rules concerning a storage incentive be kept as simple as possible, leaving more complex storage-specific considerations to policies and programs designed for storage. Storage program design elements that have been discussed in other states such as control restrictions, roundtrip efficiency, local manufacturer bonuses, etc. are more properly handled in a storage dedicated program, such as the MOR-Storage concept proposed in the State of Charge report.

With this in mind, the two core design elements that need to be determined are: 1) an incentive amount that is neither too lucrative nor insufficient and 2) a compensation mechanism that is straightforward, financeable and aligned with the source of incentive funds.

Incentive Amount Calculation Process

Stem suggests this high level process for determining appropriate incentive amounts for adding storage to a solar PV system. For each solar capacity category that has its own tariff rate, request confidential data from experienced developers in order to:

1. Estimate a typical customer's savings after installation of an average sized PV system
2. Estimate incremental savings provided by an on-site storage system that has been optimally sized
3. Subtract the incremental savings from the cost of the storage system
4. Establish the resulting remainder as the midrange of incentive needed

Stem performed some rough calculations in this way with a number of assumptions about sizing and customer demand charges. We found that the \$0.03 per solar kwh adder in the Proposal is in the range of reasonable for a customer to add a Stem storage system to a solar PV installation at a commercial building. Of course, the final determination of incentive amount will require a more rigorous process involving detailed data from developers with commercially available solar+storage solutions. With proprietary information protections in place, Stem looks forward to contributing to this effort.

Compensation Mechanism

In discussion with other stakeholders, two primary models emerged for disbursing the incentive funds per project:

- A. Ongoing payment based on production of the solar PV system
- B. Upfront rebate based on the size of the installed storage system

The following discussion of the models seeks to raise some of the considerations and calculations that the DOER should undertake without definitively recommending one of the models or exact numbers at this time.

Sizing

In either model, the mechanism should at a minimum, impose size limitations on the storage system such that the developer has the correct incentives to size the installation for delivering the most benefits to the customer and the grid. Such size limitations should be set relative to the PV system size.

Based on Stem's experience to date, a minimum limit for the power output of the storage system in the range of 25% of the power of the PV system, appears to be a reasonable starting point. In Model A, if the incentive amount is calculated for a storage system sized at 25%, then there's no need for a maximum size limit. The maximum size will be naturally limited by the amount of the incentive. In Model B, however, there would need to be a maximum limit to prevent oversizing. It would seem that 100% of the size of the PV system would be a reasonable maximum limit in this case.

In terms of storage duration, early storage incentive programs such as California's Self Generation Incentive Program (SGIP) made the simple assumption that storage systems were 2-hr duration and didn't vary the incentive based on duration. This was sufficient for a simple incentive in that it wasn't economical to severely undersize or oversize the storage system for duration.

Financing

The question of financing storage installations is usually a balance between certainty of payment streams and the policy objective to guarantee at least some minimum level of performance. The difference between Model A and Model B is the typical difference between performance based incentives (PBI) and one-time rebates. Developers and their financiers generally prefer upfront rebates as easier to finance,

but many of the stakeholders in the clean energy ecosystem are well familiar with PBIs and the accompanying financial structures.

Stem does not take a position on this at this time, but does note that the upfront rebate is simpler and should result in a slightly lower cost of capital. For the first attempt at a solar+storage incentive this may be sufficient reason to start with a rebate. The question of guaranteeing performance of the incentivized systems may be more properly left to a dedicated storage incentive program, such as the proposed MOR-Storage idea.

Incentive Structure

As discussed in the Proposal, volumetric step-downs of incentives are a well-established design element in the clean energy world. With battery costs decreasing rapidly, it makes sense to reduce the storage incentive amount as well as the solar tariff amounts. Stem would recommend however that the storage incentive is reduced according to the volume of storage deployed. This may be tied directly to the volume deployed within this program, but could also be indexed against the volume deployed across Massachusetts in the appropriate market segment (e.g. behind-the-meter storage incentive tied to total deployment of behind-the-meter storage across all programs). Because energy storage encompasses a range of technologies, cost declines do not necessarily translate across all applications.

Conclusion

Stem is highly encouraged by the inclusion of energy storage in the design of the next generation solar incentive for Massachusetts. Because the State of Charge report highlighted the untapped benefits of storage and customers are already asking for energy storage solutions, we support simple approaches that enable solar+storage use cases as soon as possible. Stem looks forward to participating in the regulatory proceedings and helping drive the storage industry forward in the state.