December 28, 2016

The Massachusetts Department of Energy Resources
The Massachusetts Office of the Attorney General
Fitchburg Gas & Electric Light Company d/b/a Unitil ("Unitil")
Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid
NSTAR Electric Company and Western Massachusetts Electric Company d/b/a Eversource

Introduction

FirstLight Power Resources (FLPR) is a New England power generation and energy storage company that owns and operates a strong portfolio of hydroelectric generation, energy storage, and Class I renewable energy generation. FLPR's New England generation fleet includes run-of-river hydro-electric facilities, pumped storage hydro-electric facilities, traditional hydro-electric facilities, and a solar farm.

Our facilities, located primarily in Massachusetts and Connecticut, represent hundreds of millions of dollars in investment and with direct employment of approximately one hundred twenty-five (125) people in the region.

Comments

FLPR appreciates the opportunity to submit written comments in response to the Department of Energy Resources and Massachusetts Attorney General's Office request for stakeholder comments. As the owner of New England's largest energy storage facility in Northfield, Massachusetts, these comments offer a unique energy industry perspective on the possibilities under the Section 83D procurement and the evaluation of those bids.

Specifically, we seek to confirm that the proposed evaluation criteria extends to evaluation of pairing of storage and clean energy consistent with the requirement to consider such arrangements under Section 83D(d)(5)(v) of Chapter 169 of the Acts of 2008, as amended by Chapter 188 of the Acts of 2016. In order to adequately consider the most effective means to maximize benefits for Massachusetts consumers from clean energy procurements under Section 83D, it is necessary for the evaluation methodology to specifically consider the value paired storage can provide through greater energy savings, carbon reduction and enhanced reliability of supply. While some of the proposed evaluation methodology identified with respect to clean energy and Class I renewable energy supply would also

apply to clean energy deliveries from paired storage, FLPR also offers the following comments to assure the value of paired storage arrangements under Section 83D can be specifically evaluated.

Question Responses

Question 4: Section 83D long-term contracts have the potential to provide the carbon reduction emissions needed to meet the Commonwealth's 2020 GWSA goals. How can the procurement be best structured to incentivize and reasonably value bids whose carbon reduction contributes to meeting 2020 GWSA goals? How can the evaluation incentivize and reasonably value bids that propose to offer clean energy delivery that maximize contributions to the 2020 GWSA goals by delivering incremental new clean energy in 2017, 2018, and/or 2019?

FLPR Response: Since all the clean energy and Class I renewable energy procured under Section 83D will yield carbon emission reductions, the question is their relative impact per megawatt-hour of clean energy or Class I renewable energy purchased and the start date of such impacts. The level of carbon emissions that can be avoided by displacing fossil generation depends on whether the Section 83D purchases avoid starting one or more carbon emitting resources or simply cause them to operate at a lower output level once started. For example, the avoided carbon emissions per megawatt-hour of a combined cycle generating facility are much higher if that generator is never started in the first place since it avoids both the fuel burn to start the unit and synchronize the unit to the system (generally referred to as start-up and no load operation) and the fuel burn to generate incremental energy once started.[1] In contrast, simply causing a combined cycle unit once started to operate at a lower output level only avoids the latter. Consequently, Section 83D purchases which can avoid starting carbon emitting generators contributes more toward achievement of GWSA goals than those that simply cause the units once started to operate at a lower output level.

The difference in impact depends on the degree to which the clean energy or Class I renewable energy can be provided consistently and the degree to which the energy purchase can be shaped to meet the electric demand the combined cycle generator would otherwise be scheduled on line to meet. The highest contribution toward meeting GWSA goals can be achieved by a clean energy or Class I renewable energy purchase that can be flexibly scheduled within peak demand hours and whose delivery is relatively certain to the system operator, ISO New England.[2] Peak energy delivery that is skewed such that not all the electric demand driving the combined cycle unit start can be met without starting the combined cycle unit will contribute less toward achieving GWSA goals, and a Section 83D purchase with variability in deliveries would likely provide an even lower contribution.

[1] See FirstLight August 11, 2016 presentation to the NEPOOL Integration of Markets and Public Policy stakeholder process at slides 8-13 available at http://nepool.com/uploads/IMAPP_Presentaion_FirstLight.pdf

[2] Most of ISO New England's (ISO-NE) decisions to start (or not start) a fossil resource are made in its day ahead energy market process. In order to avoid fossil unit commitments, ISO-NE must have reasonable day ahead certainty that the physical clean energy or Class I renewable energy would be delivered in the peak hours to meet the electric demand otherwise driving the commitment of the fossil unit. This is best achieved by planned delivery in the right peak hours and quantity of the physical energy (financial clearing of energy in the day ahead market without ISO-NE confidence in its real-time delivery is not sufficient).

These differences could be evaluated by assigning equivalent carbon emission displacement value based on time of day energy deliveries, their firmness and their ability to flexiblyschedule clean energy delivery in the ISO New England day ahead energy market.

- Firm, schedulable, energy deliveries can avoid a combined cycle unit start and each megawatt-hour of delivery could be assumed to avoid the average carbon emission rate across the average daily run of a combined cycle unit.
- Firm energy deliveries which are consistent, but not schedulable, might be deemed to achieve only part of that carbon emission displacement and a discount to the above value may be appropriate (e.g., 90%)
- Energy deliveries which are more variable or not covering all peaks in the on-peak hours will reduce output of the combined cycle unit, but not prevent its start. They would displace less carbon associated with the incremental (top) megawatt-hours of combined cycle generation.

In addition, the procurement should consider the incremental benefit of clean energy or Class I renewable energy when generated inside the Commonwealth of Massachusetts and the benefits that would provide in meeting draft Department of Environmental Protection (DEP) regulations capping the aggregate CO_2 emissions from Massachusetts' generators. *(310 CMR 7.74 (5)(a))*

Finally, evaluating the ability to provide incremental clean energy or Class I renewable energy in 2017, 2018 or 2019 to begin further progress toward GWSA goals at an earlier date would require that the clean energy or Class I renewable energy delivery is either new supply or can convert existing supply into a greater carbon reduction impact. For example, off-peak clean energy imports over existing interties that are put into storage could be delivered, and scheduled, in peak hours to achieve the maximum carbon displacement described above prior to commercial delivery of new clean energy or Class I renewable generation supply.[3]

Question 5: Section 83D requires a long-term contract to "utilize an appropriate tracking system to ensure a unit specific accounting of the delivery of clean energy, to enable the department of environmental protection, in consultation with the department of energy resources, to accurately measure progress in achieving the commonwealth's Global Warming Solutions Act ("GWSA") goals under chapter 298 of the acts of 2008 or chapter 21N of the General Laws." What requirements should be imposed on bidders so that, if selected, they are able to enter into long-term contracts that utilize an appropriate tracking system that ensures the procured clean energy can be counted towards GWSA compliance?

FLPR Response: For purposes of demonstrating that the delivery of clean energy or Class I renewable generation in any hour under the contract has been physically delivered in that hour, the seller could simply be required to affirm the energy delivered and the source of that energy in each hour on some defined reporting interval (whether monthly, quarterly, or otherwise). While it would also be important to get assignment of associated generation certificates under the NEPOOL Generation Information System (GIS) to assure that the same megawatts are not

[3] While existing pumped storage facilities move off-peak energy into peak demand periods through the ISO New England spot energy market dispatch today, this operation only utilizes approximately one-third of the daily storage throughput on average. Massachusetts has the opportunity through Section 83D to more fully use these existing water-based batteries more effectively toward achieving GWSA goals.

accounted for twice among GIS loads, GIS certificates are minted quarterly and do not possess the hourly granularity to assure a given hourly generation in a specific hour aligns with the hourly clean energy (or Class I renewable energy) purchased.

Question 8: The Section 83D bid evaluation process will require a careful review of any transmission costs associated with a bid. Please respond to the following questions relating to the evaluation of any transmission related costs:

a. What documentation and information should bidders provide in order to demonstrate the reasonableness of their transmission costs estimates included within a bid?

b. Please describe in detail how transmission cost risks should be analyzed in the quantitative portion of the bid evaluation.

c. What type of cost containment features might a bidder use to ensure that transmission cost overruns, if any, are not borne by ratepayers as required by the statute?

FLPR Response: This question is best answered by addressing the sub-questions in reverse order. Since Section 83D is about procuring clean energy commitments, the best containment feature is simply defining the procurement as a forward purchase of clean energy delivery in New England and requiring the bidder to include their cost responsibility for transmission arrangements in their offered price for clean energy.[4] Consistent with restructuring, this places the risk of cost overruns on the supplier and its transmission developer, not on consumers. It also obviates the need for the bid evaluation process to develop a method to evaluate the risk on consumers if they held the responsibility for any cost overruns, or of the need to specify documentation necessary to adequately evaluate such a risk. As identified in response to question 12 below, a model such as the clean energy commitment model, which may create the need for such documentation, also creates other undesirable risks for consumers.

Further, while the question only focuses on the risk of transmission cost overruns, the bid evaluation should consider whether the bid may provide additional value by avoiding further transmission costs.

Question 10: Section 83D requires that the clean energy resources to be used by a developer under the proposal to guarantee energy delivery in winter months. How would bidders demonstrate that proposed long-term contracts can meet this requirement? How should the evaluation process consider bids that cannot demonstrate an ability to meet this requirement?

FLPR Response: Bidders could demonstrate that the resource is located inside the New England system and has either controllable generation, paired storage or otherwise provides generation not prone to interruption in winter periods (by virtue of its clean or renewable fuel source or associated storage). Similarly, resources located outside of New England would need to demonstrate that they either have dedicated controllable generation not prone to interruption in winter periods and the facilities to transmit such energy as firm, non-curtailable energy or such clean energy is otherwise paired with storage located in New England. The evaluation

[4] Section 83D(d)(4) requires "associated transmission costs to be incorporated into a proposal; provided that, to the extent there are transmission costs included in a bid, the department of public utilities may authorize or require the relevant parties to seek recovery of such transmission costs of the project through federal transmission rates, consistent with policies and tariffs of the Federal Energy Regulatory Commission, to the extent the department finds such recovery is in the public interest."

process should eliminate bids that cannot demonstrate their ability to guarantee energy delivery in winter months, a requirement under Section 83D(d)(5)(vi).

Question 12: Section 83D requires the solicitation and consideration of proposals for long-term contracts for a period of 15 to 20 years for clean energy generation. Does 83D allow for the solicitation and consideration of proposals, as one form of bid, in the form of a delivery commitment model approach as contained in the New England Clean Energy RFP (available at: https://cleanenergyrfpdotcom.files.wordpress.com/2015/11/clean-energy-rfp-final-111215.pdf). If so, should such proposals be allowed in response to this Section 83D procurement, and do you think the ability to submit such proposals would potentially be utilized by bidders? Would your firm potentially submit such a proposal if allowed as an option?

FLPR Response: The delivery commitment model in the New England Clean Energy RFP does not appear to be consistent with Section 83D which requires the procurement of clean energy generation (Section 83D(a)) or paired energy storage(Section 83D(d)(5)(v)) and requires the cost of any transmission to be included in such proposals (Section 83D(d)(4)).

Further, that design does not guarantee winter energy delivery (a requirement highlighted by question 10) and instead creates a perverse incentive for the supplier to withhold delivery when upstream value is greater than the performance penalty of non-delivery (e.g., loss of an hour's worth of transmission cost recovery). As an example, if the megawatt-hourly allocation of transmission costs were $30/MWh and the ISO New England Locational Marginal Price of energy (ISO-NE LMP) was $500/MWh, but the value of energy on the upstream end of the transmission line was $1500/MWh, such an arrangement would encourage the supplier to exercise its implicit call option and withhold its clean energy delivery under the contract to instead sell more profitably at $1500/MWh. In that case, the non-payment of the megawatt-hour's worth of transmission cost recovery would simply be an incidental lost opportunity cost deduction to the margin under the $1500/MWh sale, yet the lost value to Massachusetts consumers would be much higher. Under this scenario, the lost transmission cost recovery would have to be over 33-times higher just to make the supplier indifferent. Of course, a slightly higher arbitrage value would produce the same result. It is virtually impossible to determine the right lost cost allocation recovery rate to negate this incentive.

In addition, since this model relies exclusively on delivery volume over the ratepayer funded transmission facility, it does not address the value storage could provide under a paired arrangement and would thereby present a barrier to competition otherwise permitted under the legislation.

There are other forms of clean energy delivery that may approximate the clean energy commitment model by simply stating a rate payable for clean energy delivery, whether fixed, or indexed (e.g., if indexed to the ISO-NE LMP, this rate could presumably look very similar to the energy commitment model rate). However, this too may leave undesirable delivery optionality on the supplier to arbitrage around that rate.

Question 14: Resource flexibility— the ability to ramp up and down in response to contingencies— is a potential consideration in the evaluation of Section 83D bids. With increasing intermittency in both load and generation, resources with the ability to respond to system contingencies, extreme events, and load/generation intermittency can help avoid reliability issues

and mitigate the impact of price spikes to customers. How should the evaluation team quantify the impact of resource flexibility? How should the evaluation be designed to give preference to resources that provide such flexibility?

FLPR Response: Resource flexibility facilitates both greater carbon emission reductions and greater energy savings. The former could be evaluated as discussed in response to question #4 above. From an energy savings perspective, beyond the ability to respond to contingencies or other system events, flexibility permits shaping of clean energy to capture the highest value hours of energy savings. According to the DOER's Executive Summary of the State of Charge Report, "the top 10% of hours…, on average, accounted for 40% of the annual energy spend" (at pages i-ii). It can permit shaping of clean energy or Class I renewable energy delivery to concentrate energy delivery in the highest value hours. Accordingly, this aspect of flexibility value could be quantified as higher energy savings. In addition to greater energy savings, flexibility could provide a more effective decrease in carbon emissions,[5] and, if delivered in Massachusetts, assist the Commonwealth in meeting GHG caps under development by the DEP without decreasing aggregate Massachusetts generation output. Stated prices of the value of carbon reduction could be possibly be used to evaluate the former and the latter could possibly be considered as a tie breaker.

Sincerely,

Len Greene
Government & Regulatory Affairs
FirstLight Power Resources

[5] The greatest carbon reductions are achieved by avoiding the start (commitment) of fossil resources versus the lesser carbon reduction per megawatt-hour achieved by simply avoiding their incremental fuel burn by reducing their output once on line. Most of ISO New England's (ISO-NE) decisions to start (or not start) a fossil resource are made in its day ahead energy market process. So, in order to avoid fossil unit commitments, ISO-NE must have reasonable certainty that the physical clean energy or Class I renewable energy would be delivered in the peak hours to meet the electric demand otherwise driving the commitment of the fossil unit. This is best achieved by planned delivery in the right peak hours and quantity of the physical energy (financial clearing of energy in the day ahead market without ISO-NE confidence in its real-time delivery is not sufficient).