The City of Boston's Responses to DOER's Clean Peak Standard (CPS) Draft Stakeholder Questions

Definitions of Key Terms

Clean Peak Resource

Clean peak resource is defined as "a qualified RPS resource, a qualified energy storage system or a demand response resource that generates, dispatches or discharges electricity to the electric distribution system during seasonal peak periods, or alternatively, reduces load on said system."

1. Should only resources interconnected to the electric distribution system be eligible to qualify, or should resources connected to the transmission system also be eligible to qualify?

Both distribution and transmission level resources should be eligible to qualify as Clean Peak Resources (CPRs).[1] *The goal of the CPS program is to ensure the full electric system emits as few pollutants as is possible; therefore all resources should participate. For example, offshore wind (OSW) facilities would reduce GHG emissions during peaks and should be qualifying resources under the CPS. See ISO New England's* "High-Level Assessment of Potential Impacts of Offshore Wind Addition to the New England Power System during the 2017-2018 Cold Spell*," dated December 17, 2018 (the "Assessment"). The Assessment states that CO_2 emissions for the New England generation fleet during the 16-day cold snap equaled 2.07 million short tons, and that 1600 MW of installed OSW would have avoided 11% of that total, avoiding 4% of coal use, 20% of natural gas use, and 7% of oil use during the period.*

2. Should DOER interpret the use of the term "electric distribution system" to mean that only facilities on the electric distribution system in the Commonwealth should be eligible to qualify as clean peak resources under the CPS? Should the CPS also include all distribution and/or transmission level resources connected in the ISO-NE control area? Should it include adjacent Control Areas such as NYISO, Quebec, or New Brunswick?

See the response to 1., above. The Massachusetts electric grid has tie-ins with neighboring states within the ISO-NE control area, and with states and provinces outside of it. Facilities throughout the ISO-NE and neighboring control areas should be allowed

[1] Note: The City of Boston has not completed its review of the February 1, 2019 Order in D.P.U. 17-146-B, which addresses NET METERING, SMART PROVISION, AND THE FORWARD CAPACITY MARKET. It is possible that the changes mandated by that Order will impact energy storage in a manner which may affect the Clean Peak Standard. The Department of Energy Resources should consider the effects of that Order on this rulemaking.

to participate in the same way, and to the same extent, as resources sited within the Commonwealth with all available qualifying resources.

Demand Response Resource

Demand response resource is defined as "changes in electric usage by end-use customers in the commonwealth from their normal consumption patterns in response to: (i) changes in the price of electricity over time, including, but not limited to, time-of-use rates for residential and small commercial and industrial customers; or (ii) incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized."

3. What types of resources should be included in this definition?

*Curtailment, and dispatchable low- or zero-carbon generating resources should certainly qualify as CPRs. Storage (including thermal, chemical and mechanical energy storage technologies) charged by low- or zero-carbon resources could be qualified, though only under certain circumstances that the distribution and transmission systems may not be able to account for currently. For example, if zero-carbon assets that could otherwise be used to directly offset coal generation are used to charge storage instead, and the storage is later used to offset gas generation, then the storage would increase rather than decrease overall emissions. Storage then, ought to be qualified as a CPR if it can be determined conclusively that it has been charged by a generating resources that is less carbon intensive than the generating resource it is replacing. This would require knowing when the storage was charged so the carbon intensity of the marginal generating resource at the time the storage is charged can be compared to the carbon intensity of the marginal generating resource at the time of discharge. This calculation must also take into account the "round-trip efficiency" of storage, which is always less than 100%, and will further narrow the margin between the carbon intensity of generating resources during charge and discharge periods. See "*Estimating the Quantity of Wind and Solar Required To Displace Storage-Induced Emissions*," Hittinger, Eric and Azavedo, Ines M.L., Environmental Science and Technology, October 10, 2017.*

4. Should electric vehicles (EVs) qualify?

EVs are, in-essence, mobile storage assets, but also represent curtailable load to the extent that their charging can be interrupted or throttled back during peak hours. As storage assets EVs should be qualified as CPRs only if they meet the identical requirements set out in the response to 3, above. That is, if it can be determined conclusively that the EV has been charged by a generating resources that is less carbon intensive than the generating resource it is replacing.

5. How should DOER interpret the inclusion of different types of rate designs in this definition?

To the extent that consumers have access to accurate price signals that identify times of peak and off-peak demand (higher and lower prices, respectively), they can be expected to respond by reducing load and/or generating electricity with qualified CPRs when prices are high, and by resuming curtailed load when prices are low. Rate designs that yield accurate price signals provided on a time scale that is sufficiently short to provide a meaningful response to periods of peak/off-peak load should thus be considered an integral part of the CPS program. In addition, it should be noted that rate designs that do provide accurate and timely price signals will encourage third-party development of devices and controls that will respond automatically to those price signals, without direct customer intervention. The result would be a CPS program that is much more responsive and yields much higher rates of participation (i.e. measured in MWh hours curtailed/generated/ discharged) during peak hours. There is the question, however, of whether the legacy billing systems of certain local distribution companies in the Commonwealth are robust enough to support rate designs capable of delivering such price signals. See, for example, the Order of the Massachusetts Department of Public Utilities with respect to D.P.U. 15-120; D.P.U 15-121; D.P.U. 15-122, dated May 10, 2018, at page 17 (regarding a National Grid proposal to upgrade its billing system to accommodate time varying rates (TVR)) and page 33 (regarding a similar proposal from Eversource to upgrade its billing system to accommodate TVR). In the City's opinion, unless local distribution companies are required to, or voluntarily replace their legacy billing systems, or make the necessary enhancements to existing systems, any discussion of including rate design in the definition is, for all practical purposes, moot.

6. Should this definition only be limited to active demand response?

Passive demand resources (e.g. energy-efficient appliances and lighting, advanced cooling and heating technologies) save electricity across periods of long duration, and reduce peak loads overall. To this extent passive demand resources have the potential to satisfy the CPS program requirement of reducing load on the electric distribution system during seasonal peak periods. For purposes of qualifying passive demand resources in the CPS program, however, it would be necessary to qualify those resources so that (i) their levels of electricity savings are accurately quantified, and (ii) that they are monitored and verified on an ongoing basis to ensure that those levels of energy savings are maintained. For this reason the City believes that the only passive demand resources that ought to be qualified for the CPS program are energy conservation measures (ECMs) installed via contracts with energy service companies (ESCOs) offering a financial guarantee for those energy savings. Even though passive demand resources qualified in this way are not dispatchable, periodic certification could satisfactorily document that the reduced levels of electricity achieved by installed ECMs are being maintained. The standards just described are those that are required by the

City of Boston's own "Renew Boston Trust" energy efficiency building program. Because passive demand resources cannot be actively and separately metered, a method would have to be developed to calculate their contribution turing seasonal peaks. That method would almost certainly have to be based on historical post-ECM installation data for corresponding peak periods and the increments of energy savings associated with each ECM.

7. Should standalone energy storage resources (i.e. not directly connected to another resource type) be eligible to qualify as demand response resources? What requirements, if any should standalone energy storage resources face in order to qualify as demand response resources?

See the response to 3, above.

8. Should the DOER view thermal storage facilities as a Demand Response Resource? What requirements, if any, should thermal storage facilities face in order to qualify as demand response resources?

Thermal storage, such as ice storage on HVAC systems, would allow for a seasonal reduction of the peak, and reduce the need to call upon higher emitting resources to meet such peaks. That result would support CPS program goals. There must, however, be some means of ensuring that charging (e.g., ice-making) is done during off-peak hours with electricity produced by generating resources that have fewer emissions than the generating resources that will be displaced during peak hours.

<u>Qualified Energy Storage System</u>

Qualified energy storage system is defined as "an energy storage system, as defined in section 1 of chapter 164, that commenced commercial operation or provided incremental new capacity at an existing energy storage system on or after January 1, 2019; provided, however, that such system operates primarily to store and discharge renewable energy as defined in said section 1 of said chapter 164."

9. How should DOER define what constitutes "incremental new capacity at an existing energy storage system"?

The definition should require the installation of new physical storage capacity, not simply changes in utilization. This could be the addition of addition of battery cells, new ice storage capacity, etc. This could be a completely new installation or an actual physical increase in the storage capacity in a existing site, e.g. by adding additional battery cells or replacing existing cells with more energy-dense cells.

10. How should DOER interpret the requirement that a Qualified Energy Storage System operate “primarily to store and discharge renewable energy”?

a. Would alignment with the federal ITC requirement that storage is eligible for a credit as long as the battery is charged by a renewable energy system more than 75 percent of the time be appropriate?

This would be a reasonable approach. What matters more than the percentage of time the storage is charged by a renewable resource, however, is <u>when</u> the storage is charged by the renewable resource. That is, if a renewable resource is used to charge an energy storage system during a period when it could be used to directly offset a high-emitting marginal resource, then the renewable resource should be used for that purpose, and not charging. See the response to 3, above.

b. If not directly physically or electrically connected to a renewable energy resource, how can the qualified energy storage system demonstrate that it operates primarily to store and discharge renewable energy? Purchase and retirement of RECs? Some other means?

Purchasing and retiring RECs would appear to be the only way to meet this obligation. Only those RECs that could be qualified to meet the RPS standard should be qualified for the CPS program. In the future there may be other means, such as blockchain, that may be used to establish a nexus between the production from a remote renewable energy resource and an energy storage system.

11. How should DOER view thermal storage facilities with respect to eligibility as a qualified energy storage system?

Thermal storage that displaces electrical load should qualify for the Clean Peak Standard provided that the source of the thermal storage is low- or non-emitting. If solar thermal offsets electrical heat, then it should qualify. Similarly, if ice storage for air conditioning displaces the operation of a condenser during the day it should be qualified as a CPR if there is some means of ensuring that charging (e.g., ice-making) is done during off-peak hours with electricity produced by generating resources that have fewer emissions than the generating resources that will be displaced during peak hours. See the response to 8, above.

<u>Qualified RPS Resource</u>

Qualified RPS Resource is defined as “a renewable energy generating source, as defined in subsection (c) or in subsection (d) of section 11F that has: (i) installed a qualified energy storage system at its facility; or (ii) commenced commercial operation on or after January 1, 2019.”

12. Given the requirement that RPS resources that commenced commercial operation prior to 2019 must be paired with a qualified energy storage system in order to qualify for the CPS, what, if any, requirements should DOER adopt regarding how much energy storage needs to be installed?

a. Should there be a minimum percentage threshold on the ratio of the size of the energy storage to the size of the renewable resource (e.g. minimum installed storage capacity equal to 25% or more than installed renewable capacity)?

> *It may make sense to have a* de minimis *threshold for ease of implementation. If that is the case, it may make sense to have a minimum set in kWh rather than a percentage of the installed capacity.*

13. With respect the quantity of its capacity that a Qualified RPS Resource can qualify under the CPS, should the DOER discount a Qualified RPS Resource's eligible capacity based on the capacity it can supply through the duration of each seasonal peak period (e.g. a 2 MW solar resource that can only provide 50% of its capacity value over the peak period would qualify as a 1 MW facility)?

> *The facility should be able to specify its level of contribution (based upon its installed capacity and capacity factors), but there should be a non-performance penalty to ensure that the resource is used to generate power during each seasonal peak period.*

14. Should DOER adopt any additional requirements regarding the CPS eligibility of renewable energy generating sources as defined in subsection (c) or in subsection (d) of section 11F (e.g. emissions thresholds, fuel sourcing, etc.)?

> *Yes. A renewable energy generating source that is paired with a qualified energy storage system should only be CPS-eligible if it is used to offset higher emitting resources, either by producing energy to directly displace a higher-emitting resources that would otherwise be run, or by charging an energy storage system during off-peak hours for discharge during peak hours.*

Seasonal Peak Periods

Establishing Seasonal Peak Periods

DOER is required to establish seasonal peak periods, which are defined by that statute as "the daily time windows during any of the 4 annual seasons when the net demand of electricity is the highest; provided however, that a seasonal peak period shall be not less than 1 hour and not longer than 4 hours in any season, as determined by the department."

15. Given these limitations, how should DOER establish different seasonal peak periods to both optimize cost reductions for ratepayers and emissions reductions for the Commonwealth?

ISO New England summer peaks occur during the months of June, July, or August. ISO New England winter peaks occur during December, January, or February. The CPS spring and autumn peak periods should thus be March, April, and May, and September, October, and November, respectively.

16. DOER is considering announcing seasonal peak periods on an annual basis based on 1 to 3 years of historical data.

a. What formula should DOER use to set the seasonal peak periods to reflect real time operating conditions?

As a general principal seasonal peak periods should be set averaging several years of weather-normalized data.

b. What data sources should DOER use to determine seasonal peak periods?

For determining the seasonal peaks, DOER should obtain the load data from the local distribution companies serving the Commonwealth, and ISO New England data regarding system peaks.

c. What time period(s) should each of the 4 annual peak periods cover?

See response to Question 15.

d. Should seasonal peak periods be different lengths depending on the season?

See response to Question 15. Further refinements should be determined through analysis of ISO New England data regarding summer and winter seasonal peaks, and ISO New England historical data for the proposed spring and autumn peaks.

e. How often should the seasonal peak periods be examined and/or adjusted to reflect changes in seasonal peak demand over time? What should be the trigger and/or the process for making such adjustments?

The seasonal peaks should be set on the basis of at least 3-year periods, and preferably 5-year periods. There is a balance between the need for predictability for participants and ensuring that the seasonal peaks are accurately reflecting system conditions, therefore, we recommend reviewing the peaks every 2-years.

17. Are there alternative methods of establishing seasonal peak periods the DOER should consider?

Atypical Peak Events

Not all system peaks occur within the same 1-4 window throughout the course of a season (e.g. a 95 degree day on a weekday in May will almost certainly not have a peak that occurs at a similar time of day as the bulk of peak periods in the same month).

18. Should DOER establish peak periods other than the seasonal peak periods during which clean peak resources are eligible to generate clean peak certificates?

a. If so, what criteria should DOER use to establish these periods and what mechanism(s) and should be used to trigger and announce these events in advance of them occurring?

b. Should DOER specifically target ISO system peaks?

Generation of Certificates

Some clean peak resources may only be capable of generating clean peak certificates during a portion of a seasonal peak period. For example, a solar resource trying to deliver energy for the duration of a summer seasonal peak period that lasts from 6-9 PM may generate a significant number of certificates in the early part of that window compared to the latter.

19. Should only resources that can provide value for the entire duration of a peak period be able to generate certificates?

> *No. The Clean Peak Standard is designed to ensure that the resources needed to meet seasonal peaks are as clean as is possible. Therefore, the proper test should be whether a CPR has contributed power during a peak period, if not the entire peak period, to prevent the dispatch of higher-emitting resources. An issue that needs to be addressed is the designation of CPRs. For example, would each of three batteries that are used sequentially to avoid dispatching an emitting resource each be a CPR, or would the entire three battery array be designated as a single CPR?*

20. Should there be different values provided to resources that can provide value for a portion of a peak period versus the entire peak period? If so, how should DOER differentiate these value streams?

> *There should be value for all resources which displace emitting sources during a peak. , It would be difficult to assess different values administratively. Moreover, if storage devices are used sequentially to meet the entire duration of a seasonal peak in the*

manner described in the response to 19, above, each storage device, if counted as an individual CPR, should be compensated on the same basis.

21. Should there be a penalty (i.e. negative credits) if a resource under-produces during the actual monthly peak?

Yes. Just as capacity resources receive compensation for being available and are penalized when they fail to meet this obligation during key time periods, CPS resources should be penalized if they fail to meet their minimum obligations when called upon to meet a seasonal peak.

22. How should resources participating in other state programs (e.g. section 83 procurements, SMART, EE programs, etc.) interact with the CPS?

As long as the participation in another state program does not interfere with a CPRs ability to meet its CPS obligations, there is no reason why it cannot participate in all available programs.

23. Should qualified energy storage systems that can demonstrate they were charged during minimum load windows be provided additional incentives or benefits under the CPS? If so, how should these be structured and how should minimum load windows be established?

The payment for CPS is to ensure that the resource is available when needed to allow that peaks be met cleanly. As a result, we do not believe that there should be separate compensation for being charged and available - instead, the base compensation should require demonstration that the resource was charged to receive payment. This is similar to capacity payments.

Metering

Verification of Metered Data

DOER proposes that all clean peak resources be registered with NEPOOL GIS as Non-NEPOOL participants. This would mean that, as required by the NEPOOL GIS operating rules, all resources would be required to report their eligible output to NEPOOL GIS by a DOER approved Independent Third Party Meter Reader. This entity would be responsible for verifying the accuracy of the reported data before uploading it to NEPOOL GIS for the creation of certificates.

To ensure that all data is collected, reviewed, and reported to NEPOOL GIS in a consistent manner, DOER would select a single entity to act as the Independent Third-Party Meter Reader, similar to the process used under the SREC programs, in which the Production Tracking System at the Massachusetts Clean Energy Center serves in this role.

24. Do you support this proposal? If not, please describe why.

Yes, if behind-the-meter CPRs are included in the program, and the Independent Third-Party Meter Reader can accurately report the contribution of such behind-the-meter CPR during seasonal peaks.

25. If DOER procures the services of a single Independent Third-Party Meter Reader:

a. What criteria should DOER use to evaluate the capabilities of the entity that is selected to act as the Independent Third-Party Meter Reader?

The criteria should be the entity's success currently accounting for the production of registered assets, and its ability to ramp its capability, if necessary, to monitor production hourly during seasonal peaks.

b. Do you support the establishment of a fee structure to support the ongoing services provided by the Independent Third-Party Meter Reader?

Yes, if it is determined that the Independent Third-Party Meter Reader best equipped to serve the program is a private company, and not a public agency, such as the Massachusetts Clean Energy Center. In determining how fees are allocated, care needs to be taken to ensure that the fees do not discourage small CPS resources.

c. How should this Third-Party verification take place?

<u>Metering Specifications and Requirements</u>

Because clean peak certificate creation is dependent not just on the quantity of energy output, but also its timing, more sophisticated metering will be required than that which is required for many RPS eligible systems, which only require monthly meter reads.

26. Describe in as much detail as possible the metering standards and requirements (type, accuracy, etc.) that DOER should employ to ensure the accurate collection of data.

The metering needs to be remotely readable, time-of-day meters to allow DOER to determine when the CPS resources are producing energy or, in the case of storage assets, charging and discharging. The metering should allow for real time determination of availability *to meet the peak, and to determine response. DOER needs to determine how to share that data with ISO-New England to influence dispatch decisions.*

27. Should different standards apply to different sizes and types of facilities? If so, please describe your recommendations in as much detail as possible.

No. The cost of real time, time-of-use meters is not that great, so all resources should be required to meet the same metering standard. The exception to metering requirements would be passive demand resources, if they are qualified for participation in the program. See the response to 6, above.

28. What other verification mechanisms could be deployed to simplify the process, particularly for small-scale systems for which some types of metering solutions may be cost-prohibitive?

We do not believe that the cost of the required metering would be prohibitive.

Value of Certificates

DOER must establish an alternative compliance payment rate and potentially other mechanisms that will help establish the value of clean peak certificates. Please describe in as much detail as possible:

29. How much value is likely needed on a per MWh basis to incentivize different types of existing resources to operate during peak windows and/or new resources developed or financed using CPS revenue streams?

A fair assumption is that the value of qualified CPRs meeting their CPS contribution requirements is approximately equal, at least, to the value of contributions made by participating demand response resources, on a MWh rather than kW basis.

30. How should DOER establish these values?

To the extent that qualified CPRs are replacing marginal resources, they should be compensated at the rate those marginal resources would have received if they had not been curtailed.

Long-term Contracts

In establishing certificate values, DOER "may include a process by which electric distribution companies competitively procure clean peak certificates from clean peak resources and enter into long-term contracts, subject to the approval of the department of public utilities."

31. If DOER does require competitive procurements:

a. What types of facilities should be able to participate in solicitations? Should it be limited to certain types of facilities (e.g. facilities that are either new and/or not already supported by another type of long-term contract or financing tool)?

All new clean capacity shall be eligible to participate. Participation in other incentive programs or receipt of other revenues should not preclude participation unless the terms and conditions of such incentives or participation would prevent a resource from qualifying as a CPR.

b. How frequently should solicitations take place?

Given the current rate of deployment of assets that might qualify as CPRs, a semiannual solicitation seems justifiable.

c. How large should the procurements be (e.g. percentage of total load or annual requirement)?

d. How should the contract price be established? Pay as bid? Reverse auction mechanism with a single clearing price for all resources? Other?

The contract price should be a reverse auction with a single clearing price for all resources similar to how other capacity is paid.

<u>Post-2019 Minimum Standard Requirements</u>

DOER has established a baseline Minimum Standard requirement of 0% for 2019. Each year after 2019, DOER is required to establish a Minimum Standard requirement for retail suppliers that increases at a rate of at least 0.25% of total retail sales annually.

32. What methodology should DOER use to establish post-2019 Minimum Standard requirements (e.g. fixed annual requirements in a published schedule, supply reactive formula, other)?

33. How large should the minimum standard be?

Demand Response Resource Carve-out

Separate from the total Minimum Standard requirement, DOER is required to establish "a minimum percentage of clean peak certificates that must be derived from demand response resources."

34. How should DOER interpret this requirement?

Effective demand response is critical to reducing the peak and reducing the emissions related to peak. Qualifying demand response needs to be non-emitting or very low emitting. It should be required to meet the same dispatch/response criteria as other clean peak resources and should receive comparable incentives and penalties.

35. What methodology should DOER use to establish this carve-out of the larger Minimum Standard?

Other

36. Please discuss any other implementation issues not addressed above.

DOER should consider how to broaden participation in this program, particularly considering how to provide the opportunities and benefits to the full spectrum of utility customers. The compensation provided by a program like this, may, especially when coupled with other incentives, provide funding sources for building improvements for smaller governmental agencies, not-for-profits, and low income customers. Reaching potential participants who do not have the resources to follow complex rules, will be difficult, but can be done through adoption of incentives, such as those in the SMART program, and through outreach and education. Coordinating the efforts with MassSave or similar programs may also provide an avenue for reaching potential participants who might otherwise not be aware of the program.