

Hourly Demand Response (HDR) Testing Proposal

Demand Response Working Group

September 4, 2019

Purpose

- To provide insight into the Capacity Qualification process and Performance Obligation & Assessment mechanism, which are planned to be introduced as part of the Capacity Auction - starting with the Dec. 2020 auction, and provide a preliminary look at how these processes may apply to demand response resources
- To provide IESO's proposal for testing of HDR resources and to review and respond to stakeholder feedback received

Capacity Auction - *Background*

Generally speaking, there are three main measures of capacity used within a capacity auction:

- *Nameplate capacity* is a resource's full-load, sustained-output capability as provided by the manufacturer.
- *Installed capacity (ICAP)* reflects the seasonal capability of a resource under conditions expected (e.g., temperature and humidity) at times of peak system need during each obligation period.
- *Unforced capacity (UCAP)* reflects the expected contribution of the resource towards satisfying resource adequacy needs, after accounting for forced outages. This is also the maximum amount of capacity that a participant can offer into an auction.

Capacity Auction – *Capacity Product*

The capacity auction is a means of competitively acquiring a defined capacity product

The capacity product is defined by the amount of qualified capacity and the performance of that capacity to meet obligations. These concepts are described below:

- **Capacity Qualification** – Provides a common base to compare the contribution of different types of resources towards meeting resource adequacy needs
 - This can be accomplished by assessing a resource's characteristics (physical & otherwise) together with any technical limitations
 - The output of this assessment is the UCAP value of the resource
- **Performance Obligation & Assessments** - If a participant is successful in an auction they will be assessed on their compliance with certain capacity obligations

Capacity Auction - *Demand Response*

- **Capacity Qualification:**
 - Consistent with other resource types, performance during previous capacity testing and/or economic dispatch may be considered when determining the resource's qualified capacity (UCAP)
- **Performance Obligation & Assessment:**
 - Consistent with the current Demand Response Auction (DRA), capacity will be assessed based on hourly offers during the availability window (12:00-21:00 EST for Summer and 16:00-21:00 EST for Winter).
 - Financial charges applied due to failed capacity testing or economic dispatch may need to be increased to recognize that capacity auctions will now be acquiring resources for reliability

Capacity Auction - *Timeline*

- The IESO is looking to introduce a Capacity Qualification process and Performance Obligation & Assessment mechanism starting with the December 2020 Capacity Auction
- Conversations will begin in Q3-2019 to develop these methodologies, through the [Capacity Auction stakeholder engagement](#)
- Part of the conversation will be to review:
 - Deadbands used during capacity testing and in-market activations
 - Non-Performance Factors
 - Timing of capacity check tests

HDR Testing Context

- Currently all HDR resources are tested for a duration of 4 hours at least once during each obligation period (previously known as commitment period)
- Stakeholders have asked the IESO to review the test duration in light of recent changes to DR activations
 - HDR can be activated for up to 4 hours as opposed to a firm 4-hour block
- The IESO presented a high level proposal for modified HDR testing at the June 19th DRWG meeting and solicited stakeholder feedback

Stakeholder Feedback

- IESO received following feedback on the HDR testing proposal:
 - AEMA
 - Supports IESO's proposal to reduce test duration based on performance.
 - HDRs should be notified in advance should IESO exercise its discretion to increase test duration back to 4 hours.
 - Rodan Energy Solutions
 - Supports the IESO's proposal to reduce test duration based on performance.
 - HDR is an hourly product whose dispatch performance is currently measured on a 5-minute basis (dispatch charge)
 - An hourly metric would be far more reasonable for HDR testing
 - AMPCO
 - Supports IESO's testing approach but hourly demand response still requires some attention from a pricing perspective, which AMPCO has noted in its submission on the Alternative Load Pricing Design
- In developing the following testing proposal, the IESO considered and incorporated the above feedback as appropriate

Key Considerations

- As per Market Rules, *Chapter 11*, HDR is a resource that is used by the IESO as a delivery type, on an hourly basis, for a demand response capacity obligation
- The IESO needs to assess HDR resource's capability to provide its full capacity obligation while following its hourly dispatch for maximum activation duration. This can be validated only through a four-hour test
- Capacity Auction is looking to introduce a Capacity Qualification process and Performance Obligation & Assessment mechanism starting with the December 2020 Capacity Auction
 - Therefore, any changes to HDR testing requirements, such as non-performance charges and dead-bands, can further change with the evolution of capacity auction

HDR Testing Background

- As per Market Rules *Chapter 7, 19.4.11* and *19.5.7*, the IESO may activate DR resources up to a maximum of two test activations per obligation period
- All DR resources are tested at least once during the obligation period
- Currently, a test activation is considered successful if an HDR resource is able to meet the following criteria:
 - deliver capacity, measured as the average load reduction over a 4-hour period, within a 20% dead-band compared to its demand response capacity; and
 - follow dispatch, measured as an HDR resource's consumption against its dispatch signals in each 5-minute interval, within a 15% dead-band.

HDR Testing Proposal

- Considering stakeholder feedback and balancing that with the IESO's objective for conducting test activations, the IESO proposes the following changes for testing HDR resources:
 - An HDR's performance during testing will be assessed primarily based on capacity delivered during each hour of the activation period
 - If an HDR resource successfully demonstrates performance (at full obligation while recognizing associated dead-bands) through a four-hour test or in-market activation, it will be subsequently tested for less than a four-hour duration
 - Full capacity obligation refers to HDR's capacity cleared during a Capacity Auction (CA) adjusted for any capacity transfer/buy-out

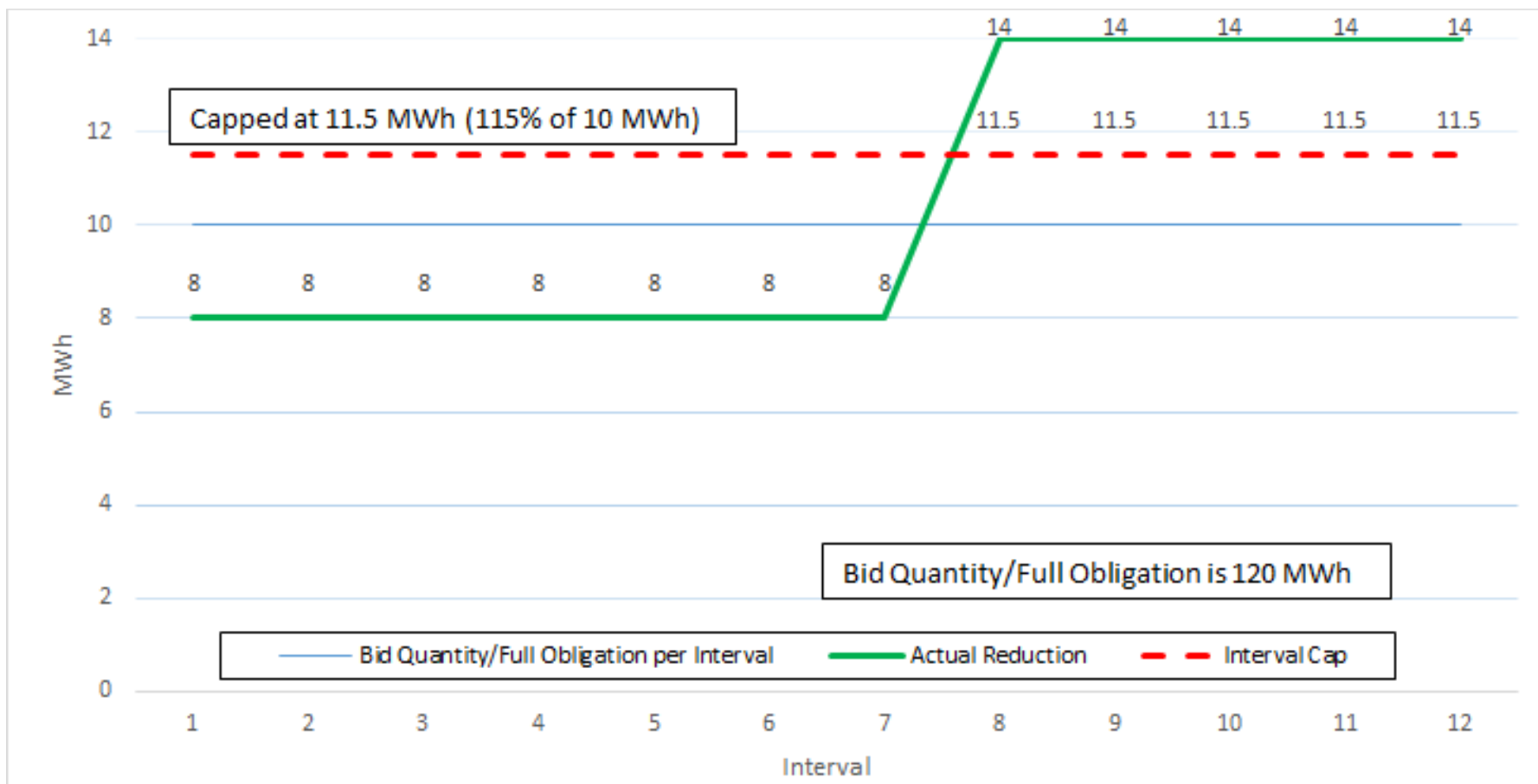
HDR Testing Proposal (cont.)

- Following a successful performance, HDR resources can be tested for a reduced duration until failing a test or in-market activation upon which another re-qualifying four-hour test would be required
 - The IESO will maintain discretion to increase the test duration for an HDR resource back to four hours to assess the HDR's response at any time.
- A second test within an obligation period will not be required if an HDR resource successfully delivers full obligation through a test or in-market activation (assessed based on the proposed criteria) during that obligation period
- Additional details of this proposal are presented on the slides that follow

HDR Testing Proposal – Successful Delivery Criteria

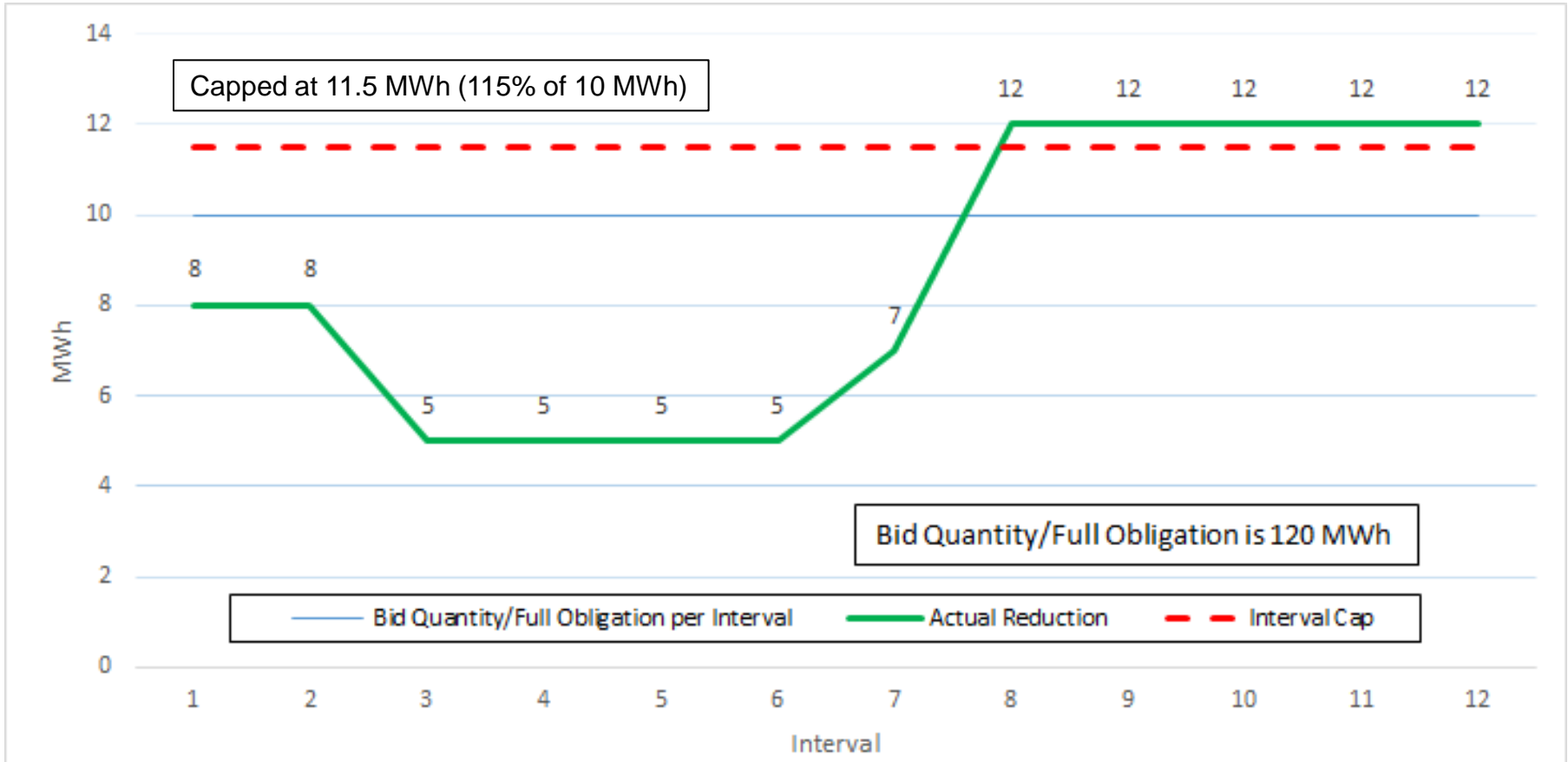
- An HDR resource will be deemed to be successful if the HDR resource delivers capacity for each hour of the activation period, within a 15% dead-band compared to its demand response capacity obligation (e.g. at least 85% of the demand response capacity obligation must be delivered)
 - The load reduction across each 5-minute interval will be summed for each activation hour (all 12 intervals)
 - The load reduction amount per 5-minute interval will be capped to 115% of HDR's energy bid quantity (15% is consistent with HDR's dispatch dead-band)
 - This is to discourage HDR to not deviate substantially from its dispatch target which requires constraining other resources that comes at additional ratepayer cost

Illustration of Assessment: Scenario A – Pass



Interval	1	2	3	4	5	6	7	8	9	10	11	12	Total	Percentage of DR Reduction Target
Bid Quantity/Full Obligation per Interval (MWh)	10	10	10	10	10	10	10	10	10	10	10	10	120	
Actual Reduction (MWh)	8	8	8	8	8	8	8	14	14	14	14	14	126	105%
Reduction Recorded for Test Assessment (MWh)	8	8	8	8	8	8	8	11.5	11.5	11.5	11.5	11.5	113.5	95%

Illustration of Assessment: Scenario B - Fail



Interval	1	2	3	4	5	6	7	8	9	10	11	12	Total	Percentage of DR Reduction Target
Bid Quantity/Full Obligation per Interval (MWh)	10	10	10	10	10	10	10	10	10	10	10	10	120	
Actual Reduction (MWh)	8	8	5	5	5	5	7	12	12	12	12	12	103	86%
Reduction Recorded for Test Assessment (MWh)	8	8	5	5	5	5	7	11.5	11.5	11.5	11.5	11.5	100.5	84%

HDR Testing Proposal – Qualifications for Triggering 1 Hour Testing

- An HDR resource that successfully delivers its full capacity obligation during a four-hour test or four-hour in-market activation (assessed using the Successful Delivery Criteria as described on slide 9) will be subsequently tested for a one-hour duration

HDR Testing Proposal: Qualifications for Maintaining One-hour Testing

- HDR test will be maintained at a one-hour duration if the following criteria are met:
 - HDR has demonstrated successful delivery of bid quantity in all activations (test or in-market) since qualifying for reduced testing, where the bid quantity must be equal to its full obligation in at least one of two most recent activations (test or in-market)
 - HDR has not increased its capacity obligation by more than 5 MW* from the last successful four-hour test or in-market activation
- IESO will maintain discretion to increase the test duration for an HDR resource back to four hours any time
 - In doing so, the IESO will provide appropriate reason(s) in advance to affected HDR participants

* 5 MW change is consistent with Non Performance Event (NPE) requirements for HDR resources

Settlement Impact

- IESO is not proposing any changes to settlement charges at this time
- Any changes to settlement charges will be revisited as part of the evolution of the Capacity Auction design

Next Steps/Timelines

- Stakeholders requested to provide written feedback on the proposal by September 18th, by e-mailing engagement@ieso.ca
- Timeline to implement these changes
 - For the first obligation period of the December 2019 auction (e.g. May 2020)
 - First reduced test duration can take place from November 2020