Payment Adjustment Mechanism

Alberta Capacity Market
Comprehensive Market Design (CMD) 1.0

February 2018

What do we want out of today

- Review Performance monitoring and payment adjustment approaches
- Look for feedback to help solidify position on items not landed
- Look for general feedback on approach

Outline

- Overview of the payment adjustment mechanism
- Review modeling results and seeking input

Overview of the Payment Adjustment Mechanism

- Goal: to ensure delivery of capacity obligation while balancing the financial risk of under availability or non-performance
- Payment Adjustment Mechanism incorporates four elements that review resources before and during the obligation period

Failure to Deliver for New Capacity Resources

- Assessed to new capacity committed resources which are at risk of not meeting their delivery obligations, e.g., due to construction delays or early retirement of the resources

Updates to Qualified Unforced Capacity (UCAP) Ratings

- UCAP ratings of resources with capacity obligations will be recalculated in advance of each rebalancing auction to reflect changes in the resource's capabilities

Availability Payment Adjustment Framework

- Unavailability payment adjustments assessed to committed resources with average availability levels below committed UCAP levels during the system tightest hours

Performance Payment Adjustment Framework

- Non-performance payment adjustments assessed to committed resources that, during emergency conditions, deliver a quantity of energy or ancillary services less than their capacity obligation adjusted for a balancing ratio (with overperformance payment adjustments rewarded for over-delivery)

Element 1:
Failure to Deliver for New Capacity Resources

- The AESO will use milestone tracking to assess the timely completion of new resources based on predefined milestones for both generation and demand resources
- New Resource owners must demonstrate that they have fulfilled development milestone requirements prior to each rebalancing auction
- New resources that have not met development milestones will be deemed to have failed to deliver on the new capacity resource and will be required
  - to buy out their obligation in the one of the rebalancing auctions; or
  - to engage in asset substitution prior to the final rebalancing auction such that their obligation is met via supply from another qualified capacity resource.

Element 2:
Updates to Qualified UCAP Ratings

- UCAP ratings of resources with capacity obligations will be recalculated in advance of each rebalancing auction to reflect changes in the resource's capabilities
- Resource with capacity obligations that experience a reduction in UCAP relative to their prequalification UCAP for a delivery period will be required
  - to buy out their obligation in the final rebalancing auction; or
  - to engage in asset substitution prior to the final rebalancing auction such that their obligation is met via supply from another qualified capacity resource

- Input from the group: should the UCAP adjustment be threshold based, that is a minimum size, or percentage of the resource, or should all UCAP changes be required to be adjusted in the rebalancing auctions

Element 3:
Availability Payment Adjustment Framework

- Availability of the committed resources will be assessed in the top 100 tightest supply cushion hours each delivery year
- The resources will be required to demonstrate that their Actual availability was at least equal to their expected availability
  - Actual availability is an amount of MW offered to energy and AS market (including dispatched), calculated as average availability during tightest supply cushion hours, multiplied by total number of assessment hours
    - For non-dispatchable resources availability will be measured as the amount of MW generated during the availability assessment hours
    - Down-by-demand response units may require different availability performance measures that take into consideration how the resource's average tight supply cushion load compares to more recent energy consumption of the load
- Unavailability payment adjustments are assessed as an average unavailable capacity volume times unavailability payment adjustment rate:
- **Unavailability Payment Adjustment Rate ($/MWh)** = 40% × 1.3 × MAX [Annual Base Capacity Auction Price; Annual Last Rebalancing Auction Price] / 100 hours

Element 4:
Performance Payment Adjustment Framework

- Performance period starts with declaration of EEA 1-3 and ends with EEA 0
  - No limit on the duration of a performance assessment period
- The under-delivered capacity amount for a capacity committed resource is calculated as actual performance minus the expected performance, adjusted for a Balancing ratio (BR)
  - The Expected performance is equal to the committed UCAP, adjusted for the BR
  - The BR is the ratio of the energy and reserves produced by committed resources during a performance event to the total procured capacity for that delivery year and is a number less than or equal to 1
  - Actual Performance is the dispatched and generated MW during the EEA events
- Performance payment adjustments are assessed as under-delivered or over delivered capacity in each hour times non-performance payment adjustment rate:
  - **Non-performance Payment Adjustment Rate ($/MWh)** = 60% × 1.3 × MAX [Annual Base Capacity Auction Price; Annual Last Rebalancing Auction Price]) / Expected EEA hours
    - Denominator could be set at an observed amount of historical EEA hours, or based on the EEA hours from the reliability model

Non-performance and Unavailability Payment Adjustments Exemptions

- Resources with capacity obligations that are constrained down due to limits on the Alberta internal transmission system will be exempt from non-performance and unavailability payment adjustments on that volume of their obligation
- Capacity resources will not be exempt from the non-performance and unavailability payment adjustments due to:
  - Forced outages or derates
  - Planned outages or derates
  - *Force majeure* events

Annual and Monthly Payment Adjustments Exposure Caps

- In the event performance and availability assessment hours overlap, availability and performance of the capacity resources will be assessed separately and, if applicable, both types of payment adjustments will be applied
- For any one capacity resource the cumulative payment adjustments exposure to Unavailability and Non-performance payment adjustments will be capped monthly and annually:
  - at **300%** of the monthly capacity revenue based on the higher of: i) the annual base auction capacity price received by that resource, or ii) the latest rebalancing auction price; and
  - at **130%** of the annual capacity revenue based on the higher of: i) the annual base auction capacity price received by that resource, or ii) the latest rebalancing auction price.

Payment Adjustment Framework Review and Discussion

Payment Adjustment Framework

- A review of performance framework 2011-2017
- A UCAP was established for 12 resources representing combined cycle and simple cycle gas, coal, wind, and intertie
- Assumed an annual capacity payment of $105/kWy (an assumption only for illustrative purposes)

- Goal – to assess different frameworks across asset types
  - One resource had a very poor performance year – out 6 months during 39 performance hours
  - Geographically vary wind resources
  - Test a number of different gas assets: combined cycle and simple cycle

Assessments

- Why 1.3x as the payment adjustment multiplier
- Why 300% as the single monthly adjustment cap
- Why 60% for the performance period
- Review impact of performance assessment hours
- Why max
  - base auction
  - rebalancing auction
- Why is force majeure not exempt from the payment adjustment framework
- Why annual availability assessment

Payment adjustment framework
Orientation for the following slides:

- Annual Cap: the annual payment adjustment cap
- Monthly Cap: the monthly payment adjustment cap
- Performance Wtg: the weighting to the performance period when allocating adjustments between the performance period and the availability period
- Perf Hours/ yr: for illustrative purposes – the number of hours used in the denominator of the non-performance adjustment formula
- Single year summary (in following slides)
  - Assessing the best and the poorest net capacity market revenues after payment adjustment framework was implemented (Revenue – positive and negative payment adjustments)
- Full period summary (in following slides)
  - Assessing the performance over the full 7 year period (Revenue – positive and negative payment adjustments)

Total Revenue after availability and performance payment adjustments

Annual Cap	Monhtly Cap	Performance Wtg	Perf Hours/ yr	Single Year Summary Min	Single Year Summary Max	Full Period Summary Min	Full Period Summary Max
130%	300%	60%	30	1%	129%	75%	105%
100%	300%	60%	30	21%	123%	81%	104%
150%	300%	60%	30	-6%	133%	72%	105%

Why 1.3x as the payment adjustment multiplier

Total Revenue after availability and performance payment adjustments

Annual Cap	Monhtly Cap	Performance Wtg	Perf Hours/ yr	Single Year Summary Min	Single Year Summary Max	Full Period Summary Min	Full Period Summary Max
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150%	300%	60%	30	-6%	133%	72%	105%

- Intent: a poor performing resource – or one that didn't show up for the year – would potentially have revenue adjustments of up to 1.3x annual revenues
  - Meant to dissuade speculative capacity market entrants that don't intend to materialize
- Finding: setting the annual cap at 130% of the maximum on the provided a balance between over and under adjustments on poor performing resources

Why 300% as the single monthly adjustment cap

- Intent: assess resources with poor availability or performance but limit payment adjustment to a maximum of 300% of any one month's revenue
- Setting the monthly cap at 300% provided some limits to the downside risk faced by poor performing assets

Total Revenue after availability and performance payment adjustments								
					Single Year Summary		Full Period Summary	
Annual Cap	Monhtly Cap	Performance Wtg	Perf Hours/ yr	Avail Hours/ yr	Min	Max	Min	Max
150%	300%	60%	30		**-6%**	**133%**	72%	105%
150%	400%	60%	30		**-18%**	**134%**	72%	105%
130%	400%	60%	30	200	-2.2%	130%	83%	105%

Why 60% weighting to Performance periods

- Intent: performance periods are periods of greatest system stress - assign a higher amount of payment adjustments to those periods than the availability periods
- Findings: setting a 60% performance period adjustment limits the downside risk to the poorer performing resources

Total Revenue after availability and performance payment adjustments

Annual Cap	Monhtly Cap	Performance Wtg	Perf Hours/ yr	Single Year Summary Min	Single Year Summary Max	Full Period Summary Min	Full Period Summary Max
130%	300%	60%	30	**1%**	**129%**	75%	105%
130%	300%	80%	30	-2%	138%	81%	107%
100%	300%	60%	30	**21%**	**123%**	81%	104%
100%	300%	80%	30	15%	130%	84%	106%
150%	300%	60%	30	**-6%**	**133%**	72%	105%
150%	300%	80%	30	-10%	142%	78%	108%
150%	400%	60%	30	**-18%**	**134%**	72%	105%
150%	400%	80%	30	-23%	144%	77%	108%

Impact of lower hour counts

- A lower hour count over the performance period greatly increases the payment adjustment that is applied during those hours
- All other things equal – reduces the single year revenue by 20% for the poorest performing balance

Total Revenue after availability and performance payment adjustments

Annual Cap	Monhtly Cap	Performance Wtg	Perf Hours/ yr	Single Year Summary Min	Single Year Summary Max	Full Period Summary Min	Full Period Summary Max
130%	300%	60%	30	**1%**	**129%**	75%	105%
130%	300%	60%	20	-19%	141%	72%	107%

Why maximum of base auction or rebalancing auction

- Intent: assign the value of performance to the maximum of
  - The price in which the resource's obligation was set
  - The most recent price for capacity prior to the delivery period

Why is Force Majeure not exemptible for payment adjustments

- Intent
  - Avoids significant uncertainty and time to decision into whether an event is a force majeure event or not
  - The risk of these costs will be priced into offers

Why is the availability payment adjustment assessed through the entire year

- Intent
  - The availability adjustment assess a resource's availability over the same measure it's UCAP was established
  - AESO considered assessing availability over shorter hours, quarterly or semi-annually, but was concerned that
    - The split would arbitrarily establish hours for assessment that didn't correspond with system tightness
    - If the split was uneven (e.g. 70 hours in the summer/ 30 hours in the winter) the outcome could be an unintended grouping of outages in the period with fewer assessment hours

Questions for discussion

- Performance framework
  - Does 60/40 performance/ availability framework achieve the intent
  - Does a monthly cap at 300% achieve the intent
  - Does the 1.3x annual revenue/ rebalancing assessment limit achieve the intent
  - Should force majeure be exemptible from payment adjustments
  - Are there alternatives to the annual availability assessment
  - Are there other things we should consider

Thank you

Appendix:
PJM and ISONE auction prices

- A review of base and final rebalancing auction prices from PJM and the ISONE