Alberta Capacity Market

Comprehensive Market Design (CMD 1)
Design Proposal Document

Section 10: Roadmap for Changes in the Energy and Ancillary Services Markets

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Date: January 26, 2018

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10. Roadmap for Changes in the Energy and Ancillary Services Markets

This section outlines how the energy and ancillary services markets will evolve with the introduction of the capacity market, and in anticipation of expected system changes. These changes include rules that are required to facilitate delivery of the capacity market product, to integrate the anticipated Alberta generation fleet (increased variable generation, coal retirements, etc.), as well as to improve market efficiency.

Section 10.1 outlines the energy market offer obligations; Section 10.2 identifies the changes related to energy market monitoring, and mitigation, and Section 10.3 addresses reviews pricing methodologies for price cap, and shortage pricing. And Section 10.4 is a summary of market changes that have been evaluated as part of the Energy and Ancillary Services (EAS) scope but are now recommended to be taken out of scope of the current design project. While some of these design elements may still be linked to a future market or system operation trigger or a new business case, these items, as explained in the rationale document, have been identified as not pressing to the current design project for implementation of a capacity market and pending system changes given changes to the fleet.

The timeline for implementation of changes in the energy and ancillary services markets is still being evaluated, and is anticipated to be included in Comprehensive Market Design 2. Once the dates are applied, the section will overall refer to the EAS Roadmap (related to the key design elements of study), noting what changes will be implemented when to address market evolution.

10.1 EAS Rules – Status Quo and Pending Changes

10.1.1 Offer Obligations, Dispatch and Scheduling

The following resource types will have the following offer obligations in the EAS markets.

- A generating unit, aggregated generating facility or energy storage facility:
  - That has a capacity commitment, and a maximum capability (MC) of 5 MW or greater, must offer its MC volume into the energy or AS market unless its AC is reduced from its MC due to an acceptable operating reason (AOR). It must offer, and be available for dispatch up to its AC volume.
  - That has a capacity commitment, and has a maximum capability (MC) of less than 5 MW, does not have to offer but has an option to offer if its AC is 1 MW or greater.
  - That does not have a capacity commitment, and has a maximum capability (MC) of 5 MW or greater, must offer its MC volume into the energy or AS market unless its AC is reduced from its MC. A restatement of its AC will be accepted with an acceptable operating reason (AOR). It must offer and be available for dispatch up to its AC volume.
- An import asset:
  - That has a capacity commitment (capacity committed import or CCI), must offer its capacity obligation volume into the energy or AS market. It may offer in a price taker block at $0 or it may request priced assets and will receive seven price-quantity pairs. If its offer block is dispatched from a priced block, it may set system marginal price, and intra-hour schedule changes may be performed. It must ensure balancing authorities and transmission providers along the transmission path into Alberta will approve interchange transactions at any time during a settlement period (having an E-Tag request not approved for scheduling practice reasons is not an AOR).
  - That does not have a capacity commitment continues to have optional offer obligations, however, when offering, they may offer in a price taker block at $0 or request priced assets and offer in seven price-quantity blocks. If its offer block is dispatched from a priced block, it may set system marginal price, and intra-hour schedule changes may be

performed. It must ensure balancing authorities and transmission providers along the transmission path into Alberta will approve interchange transactions at any time during a settlement period (having an E-Tag request not approved for scheduling practice reasons is not an AOR).

- An export asset may bid in as a price taker at $999.99 or may request priced assets and receive seven price-quantity blocks. If its priced bid block is dispatched, it may set system marginal price, and intra-hour schedule changes may be performed. It must ensure balancing authorities and transmission providers along the transmission path into Alberta will approve interchange transactions at any time during a settlement period (having an E-Tag request not approved for scheduling practice reasons is not an AOR).
- A load or an aggregated load:
  - That has a capacity commitment of 5MW or more must submit bids for its capacity obligation volume into the energy or AS market. Capacity committed loads have the option to bid at the price cap and will be directed last prior to releasing contingency reserves (as part of supply shortfall procedures). Capacity committed loads that are considered “down-to” must bid at the price cap. System and IT tools impacts will need to be assessed.
  - That has a capacity commitment of less than five MW, does not have to submit bids but has an option to bid if its capacity commitment is 1 MW or greater.
  - That does not have a capacity commitment, will continue to have the option to submit bids of at least 1 MW. It may also continue to act as a price responsive load or demand response resource.
- All offers and bids must be submitted with prices between the market offer cap and offer floor except for capacity load bids as described above, or unless *ex ante* mitigated as per the rules below.
- All offers including import offers must submit a ramp rate by block and comply with tighter ramping compliance dispatch tolerance around these levels.
- Accepted ancillary services offers will continue to be netted off energy offer obligation volumes.
- Offers into the AS market will continue to be optional.
- Long lead-time energy (LLTE) will continue to offer with a start-up time of greater than an hour. Rules for directives to LLTE will be aligned with incentives for capacity obligations and proposed rules for self-commitment.
- The mothball rule will be amended to align with delist requirements in the capacity market.

10.1.2 Dispatch and Scheduling

- Dispatch of the energy and ancillary services markets will continue using the respective energy and ancillary services merit orders as today independent of any capacity obligations (further evaluation of Security-Constrained Economic Dispatch (SCED) will impact this conclusion). Any energy dispatched must comply with dispatch instructions and remain within dispatch tolerance, including for ramp rate.
- The Security Constrained Economic Dispatch (SCED) model will be evaluated as part of a flexibility package including consideration of a ramp product and co-optimization of EAS. In this model, the merit orders will be dispatched in real time on five minute basis to meet load, and in anticipation of any ramp constraints. Prices will be set for energy, and ramp. An advanced SCED will be run to support self-commitment.
- Shorter settlement (15 minute settlement) will be applied for pool assets except hourly settlement will be applied for retail loads.
- Capacity-committed loads must be dispatched to reduce volumes at submitted prices, and must follow dispatch instructions. Non-committed capacity loads acting as price responsive load or demand response can continue to dispatch without a bid.

- Priced imports will be dispatched as other generating assets in the merit order at any time during the settlement period. If a priced import offer is dispatched on during a scheduling hour, it may set system marginal price as dispatched. If the import offer is dispatched off during the hour, intra-hour schedule changes may be performed.
- All priced imports and exports must make arrangements to ensure the interchange energy can flow as dispatched at any time during a settlement period (balancing authorities, and transmission providers will approve interchange transactions intra-hour).
- Any asset in the merit order may be directed as required to meet reliability reasons.
- Supply shortfall events will be managed by a procedure that provides for a priority to capacity committed loads that are bid at the cap to be directed last prior to releasing reserves.
- Supply surplus event to be managed as defined by the current Rule: dispatch down the $0 blocks to the minimum stable generation (MSG) levels, then dispatch off generating units as needed to balance supply and demand.

10.1.3 Dispatch Variance

- The dispatch variance rules will be tightened to reflect dispatch compliance by block to comply with submitted ramp rates by block.
- Allowable dispatch variance (ADV) will remain applicable to wind generation and extended to solar facilities (ADV definition amendment is to become effective on Sept. 01, 2018).

10.1.4 Unit Commitments

- Self-commitment will continue as per current ISO Rules for all resources.
- Generation resources, variable generation resources, intertie resources and energy storage resources, regardless whether capacity resources or not will self-commit to be ready to meet dispatch requirements as per ISO Rules Section 201.7, *Dispatches*.
- Self-commitment requirements also apply to capacity-committed load resources.
- Long Lead Time Energy (LLTE) resources will also submit offers to manage their self-commitment. Rules will be examined to align with capacity obligations and incentives related to a self-commitment model that leaves risks and costs with assets to manage.

10.1.5 Outage Scheduling:

- Generation capacity resources, variable generation capacity resources, energy storage capacity resources and capacity-committed load resources, with MC 5 MW or greater, must comply with ISO Rules section 306.5, Generation Outage Reporting, and Coordination. A new rule will be written to reflect load obligations.
- Generation resources, variable generation resources, and storage resources that are not capacity resources, with MC 5 MW or greater, must also comply with ISO Rules section 306.5 Generation Outage Reporting, and Coordination. Loads that have not capacity commitments must continue to comply with ISO Rules section 306.3 *Load Planned Outage Reporting*.
- The AESO does not provide approval of outage scheduling, and may cancel an outage as required.
- Long-Term Adequacy (LTA) and Short-Term Adequacy (STA) rules will be adjusted to reflect capacity resources.

10.2 Energy Market Monitoring and Mitigation

- *Ex ante* (in advance of the delivery hour) mitigation will be developed to supplement the current Ex post (after the delivery hour) monitoring and mitigation.
- *Ex ante* market power screens will be introduced into the energy market. An hourly pivotal supplier screen will be calculated to determine potential for market power. Companies that fail the screen must submit offers below the acceptable mitigated levels as measured on a fuel type or opportunity cost assessment as detailed below.

- *Ex post* market market-power evaluation will continue.

Pivotal Supplier Screen

- A pivotal supplier screen will be evaluated based on a residual supplier index (RSI) as calculated hourly at T-3, based on company offer control as a share of the market.
- The pivotal supplier calculation used provides adjustments for certain resource types such as dedicated supply (supplier purchases to serve its load), and suppliers with only wind/solar variable type resources. Import MW offers will only be limited to up to the intertie transfer capability.
- The approach can be summarized by the following equation :
- $$RSI_{it} = \frac{\sum_{j=1}^{n} Supply_{jt} + Imp_t - (Supply_{it} + Imp_{it} - Obligation_{it})}{Total\ Market\ Demand_t + Export_t + Reserves_t}$$

  The RSI for *Supplier*$_i$ in period *t* is:
- where the sum of *supply*$_{jt}$ represents the total capacity in the market at the relevant time *t*. *Total market demand* is the total demand in the market at time *t*. *Supply*$_{it}$ represents *supplier*$_i$'s total resources made available to the market at time *t.*
- *Supply* $_i$ includes full capability of units as measured by AC that may be offered in the energy or AS markets, and long lead time assets that have not been synchronized to the system. This threshold will be adjusted on occasion to ensure it is sufficient to restrict the abuse of market power.
- The RSI threshold will be set at 0.9. $RSI_i < 0.9$ will indicate companies that fail the screen based on their composite offer control.

Conduct Mitigation – Offer caps by assets of failed pivotal companies:

- Companies that fail the RSI screen as measured at T-3 must submit offers for each of their associated assets at T-2 that are restricted to the conduct mitigation levels (i.e., limits on offer behaviour) as outlined below:
- The conduct threshold will set an offer cap by asset fuel type as determined by 3 x short run marginal cost or by exception as noted below.
- The fuel-based bid threshold will be calculated at 3 x marginal cost defined as heat rate x fuel price + variable O&M + carbon cost.
- Owner of a capacity resource will have the opportunity to submit an exception request for approval and submit actual short-run marginal cost and if approved, these costs will be included as part of the 3 x conduct threshold evaluation for associated relevant assets.
- For non-thermal resources, owners of capacity resources will have the ability to submit opportunity cost for approval and these costs if approved will be included as part of the 3 x conduct threshold for associated company assets.
- The gas price used in the fuel price is the monthly Canadian natural gas price for the month in $/gigaJoule at AECO C, and Nova Inventory Transfer, the Alberta Bidweek Spot Price, as published on www.ngx.com, and also in the "Canadian Gas Price Reporter." [reference: ISO Rule section 201.6 Pricing].
- Market power screen and mitigation apply to both capacity and non-capacity resources on a company offer control basis.
- *Ex post* monitoring and mitigation will continue.

10.3 Pricing Methodologies

- Offer cap – no change from current $999.99/MWh subject to offer mitigation in Section 10.2.
- Offer floor – no change from current $0/MWh.
- Current shortage pricing is $1,000/MWh which is triggered when a directive has been issued to shed firm load. No change to shortage pricing.

10.4 Out-of-Scope Components for Energy and Ancillary Services Market Reforms

- The following design changes will not be included as part of the capacity market rule package or market roadmap, though they may be considered as part of a separate evaluation at another time as the need arises. The reason for this categorization is outlined in the rationale document though a brief explanation is summarized here.
  - Locational marginal pricing – with the current policy related to unconstrained and recent system build-out, pricing on transmission grid is not required at this time.
  - Offer cap above $999.99.
  - Negative pricing – the supply surplus events are currently cleared administratively and few issues have resulted. Introduction of negative pricing comes with some issues as well but will be reviewed as warranted.
  - Shortage pricing – supply shortfall events are also managed administratively and with few issues. Further, it is anticipated that with the introduction of a capacity market, shortage events will be even fewer. However, this concept will be further reviewed as required to incent price responsive behaviour near shortages.
  - Security-constrained unit commitment – centralized unit commitment will be evaluated in the future if identified by reliability issues caused by increasing supply surplus events or as part of an integrated solution like time ahead market. A self-commitment model maintains the risk with generators and sends incentive for flexible resources.
  - Intertie dynamic scheduling.
  - Co-optimization of energy, and ancillary services – on its own, not passing the modelling evaluation when considered against implementation costs; however, it may be considered as part of pending SCED evaluation.
  - Day-ahead Market (DAM) – the value of a DAM is heightened if concerns about market power are not mitigated or if the market values moving to a security-constrained unit commitment model are required to manage reliability risk. As a separate design element, the DAM effectively acts as a financial trading model, which most participants can handle independently outside of the market.