Alberta Capacity Market

Comprehensive Market Design (CMD 1)
Design Rationale Document

Section 4: Forward Capacity Auction

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4. Forward Capacity Auction

To allow for effective new entry, the AESO proposes to conduct a forward-capacity auction. This section contains the reasoning behind the proposed auction timeline, format and mechanics.

4.1 Forward Period

Input from Working Group Members and Industry Stakeholders through SAM 3.0:

- The auction should be held three years prior to the obligation period:
  - The WG unanimously recommended that the auction should be held three years in advance of the obligation period
- Industry stakeholders were largely supportive of a three-year forward period, with those not in support noting:
  - A three-year forward period is too long for short-lead resource types (e.g., energy efficiency, demand response, etc.) to meaningfully participate
  - The rules and regulations could change between the forward period and the delivery period

Comparison to SAM 3.0 Position:

- The proposed design is not substantially different from what was described in SAM 3.0

AESO Rationale:

The three-year forward period is long enough to achieve the benefits of a forward auction: orderly entry, and exit of resources, and reduced price volatility. At the same time, while supply and demand conditions are less certain three years forward, they can still be forecast with reasonable accuracy. Many capacity markets have adopted similar forward periods, including PJM, and ISO-NE (three years), and the UK, and Ireland (four years). The three-year forward period has also received unanimous support from the Capacity Market Technical Design Working Industry Group.[1]

Forward auctions support orderly entry-and-exit decisions by establishing market expectations well in advance of delivery. Resources will be able to complete their interconnection and have additional time to complete construction prior to the start of the delivery period.[2] Similarly, resources can signal to the market their intention to retire well in advance, or choose to retire in response to a reduction in forecasted load.

All else equal, a three-year forward market should have lower price volatility than a prompt market due to a more elastic supply curve. With three years of lead time, new resources can make investment decisions based on auction results, allowing more effective competition between new and existing resources. When prices are high, substantial amounts of capacity are available to enter the market. Conversely, existing resources may retire and less new supply will enter if prices are low. This reflects the adequate time for course correction provided by the three-year forward market. The impact of these factors can be

[1] See Capacity Market Technical Design Working Industry Group Recommendation, SAM 2.0, and https://www.aeso.ca/assets/Uploads/Capacity-Forward-Period-DAS.pdf

[2] The AESO connection process shows that the target timeline between the initiation and the approval of energization of a connection project is 96 weeks. After the connection period, extra time and activities are also required before a project can begin commercial operation.

observed in comparing the PJM supply curves with MISO's. MISO, with its prompt capacity market, has a much steeper supply curve compared to PJM's three-year forward market.[3]

Some larger resources require more than three years of lead time to come online and therefore might prefer a longer forward period. These longer-term resources might need to make significant investments before entering and potentially clearing the capacity market. While these resources take on some additional risk by making investments prior to clearing the capacity auction, they are by no means excluded from the market. The capacity market's transparent price signal allows these resources to make investment decisions based on market fundamentals. The additional risk taken on by resources with longer development timelines is mitigated by the sloped demand curve, and more elastic supply curve in the forward capacity market, which serves to reduce price volatility and help stabilize long-run prices around net-CONE. While a longer forward period might benefit the subset of long lead-time resources, these benefits would likely be offset by the costs of increased forecast error.

While the AESO has proposed a three-year forward auction, we acknowledge that the forward approach has drawbacks. In its report to Alberta's Market Surveillance Administrator, Potomac Economics drew a different conclusion and recommended a prompt auction, conducted only weeks or months before the start of the delivery year.[4] Potomac observed that forward auctions lead to greater uncertainty in load, and supply availability relative to prompt auctions. We agree with this observation, but consider the increased forecast error an acceptable tradeoff given the orderly entry-and-exit decisions and reduced price volatility associated with forward auctions. We also acknowledge Potomac's observations that forward auctions are less beneficial for new resources with longer construction lead times.[5] As we discussed above, we believe that such resources can still participate in forward auctions, and may benefit from their reduced price volatility relative to prompt markets.

The three-year forward period strikes a balance between allowing enough lead time for new resources to complete construction after clearing the capacity market and managing uncertainty about future demand, and supply conditions. While a longer forward period would allow larger resources more flexibility before making significant financial commitments, and a shorter forward period would reduce market uncertainty, a three-year forward period provides a balance of market participants needs to run a successful capacity market.

Auction Timeline and Procedures

As discussed in Section 4 of the CMD 1 proposal document, the forward capacity auction will involve a series of sequential process steps that begin eight months before the auction itself and end at the start of the delivery period three years later. Prior to the auction, AESO will release information on capacity qualification, market mitigation and auction parameters. Doing so in advance of the auction will allow market participants to effectively incorporate this information into their decision-making process.

[3] Newall, Samuel A., Kathleen Spees and David Luke Oates (2016), Before the Federal Energy Regulatory Commission, Docket No. ER17-284-000, Testimony of Dr. Samuel A. Newell, Dr. Kathleen Spees, and Dr. David Luke Oates on Behalf of Midcontinent Independent System Operator (MISO) regarding the Competitive Retail Solution., November 1, 2016. Available: http://files.brattle.com/files/1026_testimony_of_newell__spees_and_oates_docket_no._er17-284-000.pdf

[4] See Section III.2. of Potomac Economics, "Report on Best Practices in Wholesale Electricity Market Design," November 2017, Prepared for the Alberta MSA, Available: https://albertamsa.ca/uploads/pdf/Archive/00000-2017/2017%2011%2029%20Report%20to%20Alberta%20MSA%20Final.pdf

[5] Potomac also observed that a single year of capacity revenues is a small portion of the revenue requirement of a new resource. While this is of course true, this is a feature of capacity markets generally, and has no bearing on the choice of forward period.

4.2 Obligation Term and Period

Input from Working Group Members and Industry Stakeholders through SAM 3.0:

- The WG recommended that the obligation term will be one year for all resource types, however, opinions were split between a one-year term and an option for a longer lock-in for new or uprated resources:
  - A one-year term for all was viewed as the best and lowest-cost option and would be non-discriminatory between asset types, would provide better liquidity in the market and would reduce the risk of over-procurement.
  - Those who voted against the recommendation preferred a seven-year obligation term for new assets. They were concerned that a one-year obligation term would not be long enough to attract new entrants and it would increase financing costs for new resources which may result in higher capacity market costs for consumers.
  - Industry stakeholders were also split on the obligation term, restating the same concerns noted by the working group members.

Comparison to SAM 3.0 Position:

- The design is not materially different from what was described in SAM 3.0

AESO Rationale:

Additional examination of the expectation that a one-year term will meet the objective of ensuring sufficient investment in new capacity as well as the pros and cons of alternative approaches, will need to be undertaken in the weeks and months ahead. As is evident from stakeholder feedback on the issue, there are a wide range of views which require further examination before a position can be finalized.

The one-year obligation proposed establishes a fair and competitive market for capacity resources.[6] A one-year timeframe allows the capacity market to promptly reflect current supply, and demand conditions, responding to trends and changes as necessary. A longer obligation term may be more prone to inefficiencies due to forecast errors, reduce the incentive to capacity providers to innovate and cut costs, and not allow resources to promptly make retirement, mothball, and upgrade decisions. A potential downside of a shorter obligation term is that it could fail to provide enough certainty to attract new resources and investment. A one-year obligation term for existing resources is a proven timeframe, already implemented in PJM, ISO-NE, MISO, UK, and Ireland.[7]

Some capacity markets allow new or uprated resources to lock-in the forward capacity price for a term longer than one year. ISO-NE currently allows a lock-in of seven years, and the UK allows lock-ins of up to 15 years. Price lock-ins protect investors from the risk of regulatory intervention to suppress price and reduce financing costs of new resources. However, lock-ins are not consistent with the core design principle that all resources should receive equal compensation for providing the same product. Granting new and uprated resources a price lock-in provides different treatment to these resource types, distorts investment incentives, and reduces the efficiency of investment in the market. Lock-ins also distort prices by creating a block of supply that does not respond to price, and that may displace lower-cost resources. For example, if prices are falling over time, a new resource that cleared at a higher price will continue to receive a capacity payment even if a lower-cost existing resource is no longer able to clear. In the long

[6] See AESO (2017). AESO (2017). *Design Alternatives Sheet: Obligation Period* 2017. Available at: https://www.aeso.ca/assets/Uploads/Capacity-Obligation-Period-DAS.pdf

[7] NYISO is the only major capacity market that does not use a one-year obligation period. It uses a six month seasonal obligation, with monthly adjustment auctions.

run, these inefficiencies run the risk of resulting in higher prices for customers. By reducing price risk for new, and refurbished resources, price lock-ins transfer risk from investors to customers and as such are not consistent with that aspect of design criteria.

Evidence from other jurisdictions indicates that a one-year obligation term, without the possibility of a multi-year price lock-in, is capable of providing sufficient incentive to attract new investment. The approach has been successful in PJM, which has attracted substantial new supply even with relatively volatile prices. The AESO's downward-sloping demand curve is designed to reduce variability as supply and demand conditions vary over time and, as such, is another element of the market design that contributes to revenue stability. [8]

A one-year obligation period allows all resources to compete and receive payments on an equal playing field, which ultimately decreases market inefficiencies, and still allows new resources to enter the capacity market.

An obligation period running Nov. 1 through Oct. 31 allows the final rebalancing auction to be held closest to the winter peak load. This provides the most accurate forecast for this period and ensures maximum likelihood that reliability objectives will be maintained during the winter period through more accurate forecasts of load and capacity volume estimates.

Allowing seven offer blocks is expected to be more than sufficient for sellers to represent a wide range of different resource configurations, and is consistent with the allowed number of segments in other jurisdictions. A minimum block size of 1 MW is consistent with the overall market minimum resource size. Information on the divisibility of a block is required for market clearing.

4.3 Resources Supported by Out-of-Market Payments

Input from Working Group Members and Industry Stakeholders through SAM 3.0:

- The WG was directionally aligned that out of-market payments should be addressed prior to the auction clearing:
  - For new resources that are eligible to participate in the capacity market and receive an out-of-market payment most group members favoured a minimum offer price (MOPR) approach that would adjust the cost of these resources by having their capacity offer reflect their go-forward fixed costs without consideration of the out-of-market payment.
  - For resources that are not eligible to participate in the capacity market and receive an out-of-market payment, most group members favoured a method in which those resources would be inserted at the top of the supply curve after the market clears to avoid over-procurement of supply and to promote a higher capacity market settlement price.
  - The WG members who represented load customers were not in favour of either approach and preferred treatment where these resources did not have their offer prices adjusted for any out-of-market payments.
  - The WG was not aligned on the definition of an out-of-market payment.
- Industry stakeholders were split on its opinions of how to deal with out-of-market payments, with numerous proposed solutions including:
  - Applying a MOPR rule to account for the out-of-market payment.

[8] Pfeifenberger, Johannes P., Samuel A. Newell, Robert Earle, Attila Hajos, and Mariko Geronimo (2008). *Review of PJM's Reliability Pricing Model (RPM)*, June 30, 2008. Retrieved from: http://files.brattle.com/files/6328_review_of_pjm's_reliability_pricing_model_pfeifenberger_et_al_jun_30_2008.pdf

- Deem resources that receive a true out-of-market payment (e.g. REP Round 1 resources) ineligible to participate:
  - Reduce the overall procurement volume by the MW that have already received a capacity payment outside of the market.
- Do not apply a MOPR and allow resources to bid in at their subsidized cost (to keep capacity costs low).

Consistency with SAM 3.0 Position:

- The AESO's proposal does not generally align with the WG directional indication. Note that the majority vote was completed without support of load representatives. The AESO's proposal is aligned with stakeholder feedback that REP Round 1 resources should not be eligible to participate in the capacity market.

AESO Rationale:

Assets who have entered a Renewable Electricity Support Agreement (RESA) under the first round of the REP auction will be ineligible to participate in the capacity market, but their quantities will be accounted for in auction clearing. Compensation for the capacity value of these resources is provided by the form of payment contained in the RESA. Subtracting this capacity value from the target capacity volume avoids over-procurement of capacity and reduces costs to load. Any potential distortionary impact to the capacity market is expected to be minimal, given the expected magnitude of capacity value for the REP Round 1 assets. Alternative adjustments may be considered depending on the details of future REP rounds with respect to volumes and pricing mechanism.

On a more general basis, there could be many forms of out-of-market payments made to capacity market-eligible resources. However not all out-of-market payments need to be addressed in the price formation in the capacity market. The definition below recognizes that potential distortions to the capacity market price signal from direct subsidies should be addressed while recognizing that other policy objectives should be considered and consumers should have the opportunity to benefit. The payment types that should be considered are:

- Payments made by the provincial government or a regulated entity, funded by Alberta rate-payers or tax payers made outside the existing wholesale market and meant to contribute to the return on and/or of investments in the provision of capacity:
  - As discussed above, REP Round 1 assets have received payments that match this description, and will not be eligible to participate in the capacity market.

In the AESO's assessment, other than REP Round 1 assets, there are currently no other assets that are deemed to receive out-of-market payments utilizing the definition above. Should such resources be identified, a MOPR mechanism as described below could be applied. However, given that no assets have been identified, adoption of the MOPR concept for out-of-market payments into the initial set of rules is not being recommended given time and resource considerations.

Under a potential MOPR mechanism resources that receive out-of-market capacity payments as defined above would have their offer prices in the auction adjusted to account for the benefit received by the out-of-market capacity payment.

4.4 Single-Round Uniform Price Auction Format

Input from Working Group Members and Industry Stakeholders through SAM 3.0:

- The WG recommended that the auction should be a single round, sealed bid auction.

- The majority of the group believed this auction approach promotes the lowest offer prices to be submitted, is easier to implement and helps to level the playing field between new entrants and incumbents.
- Three dissenting members favoured a descending-clock auction believing this approach allows for price discovery and provides participants the opportunity to adjust to the new capacity market.

- Industry stakeholders are largely supportive of a single, sealed bid auction as simpler, however some comments reflect a desire for a descending-clock auction to avoid a winners curse and to aid in price discovery.

Comparison to SAM 3.0 Position:

- The design is not materially different from what was described in SAM 3.0

AESO Rationale:

The AESO is proposing to use a sealed-bid, single-round, uniform pricing auction for its forward and rebalancing capacity auctions. This is the most common auction format among existing capacity markets and is used in PJM, MISO and NYISO. It has a number of benefits relative to the other potential auction format: the descending-clock design used in New England and the UK's capacity markets. The sealed-bid, single-round design minimizes the opportunity for gaming, and encourages participants to offer at cost, a particularly important consideration given Alberta's small size and relatively concentrated market. The sealed-bid auction is also simpler to administer. Overall, a sealed-bid, single-round, uniform pricing auction should help facilitate a fair, efficient, and openly competitive capacity market in Alberta.

Sealed-bid, single-round auctions minimize the opportunity for gaming by limiting market participants' access to information about competitors' bids. Sealed bids ensure that market participants cannot directly observe their competitors' offers. The single-round format allows auction participants to submit offers into only one clearing round. There are no further auction rounds that allow participants to revise their offers after seeing the result of previous rounds. While participants have some insight into how their competitors will offer based on the outcome of previous auctions, and their knowledge of market conditions, this information is very incomplete. Without information about competitors' offers, market participants are incentivized to offer at cost, find it difficult to tacitly collude, and have a hard time exerting market power by withholding supply. This also allows the market to provide accurate price signals to suppliers entering or exiting the market. These considerations are particularly relevant given Alberta's relatively small electricity market.

During a descending clock auction the auctioneer starts each round by issuing a price and asking capacity sellers to state the quantities they wish to sell at this price. If the quantity offered exceeds the target quantity to be procured, the auctioneer issues a lower price, and again asks capacity sellers the quantities they want to offer at the new price (hence, descending clock). This process continues until the quantity offered matches the quantity to be procured or until excess supply is negligible.

The descending clock's "multiple-round" structure reveals information on supply offers after each round of bids (such as how many MW exited the auction), providing opportunities for some supply resources to take advantage, and coordinate offers or use market power to sway the auction results. Given the size and concentration of the Alberta market, this feature of the descending clock auction format introduces additional opportunities for gaming which could potentially offset benefits from increased price discovery that this format might provide. In addition, the descending clock format favors incumbents relative to new entrants. Under the descending-clock auction, established participants are better able to take advantage of the information revealed during the auction itself due to their better information about the system. Given Alberta's unique characteristics of relatively small size and concentration of incumbents, the AESO's view is that a seal-bid, single-round auction is more appropriate.

Uniform pricing provides a single clearing price for every supply bid that clears the auction. This feature incentivizes market participants to submit cost-based offers to ensure they are cleared in the auction and make at least enough revenue to cover their net going forward costs. Uniform pricing is also fair, in the sense that resources providing the same product (capacity) receive the same price. In contrast, auctions with non-uniform pricing introduce incentives to offer above cost. For example, pay-as-bid auctions encourage low-cost resources to offer above cost in order to capture a higher price for greater revenues.

Sealed-bid, single-round and uniform pricing auctions are also simple and straightforward to implement. The operator builds the supply curve (based on all of the bids received in the single-round) and the system demand curve implements any constraints (such as locational or import constraints), and then clears the market at a single price by maximizing social surplus between the two curves. By contrast, the descending clock auction is more challenging to implement: (1) it requires additions parameters like step size, price band width, and infrastructure to enable communication between the ISO and market participants during the auction; (2) it creates challenges for handling of scarce import capability, and (3) is intended for a single-buyer auction, and it is thus unclear how the descending clock auction would work for a rebalancing auction if market participants are trying to buy out of their obligation.[9]

The sealed-bid, single-round uniform pricing auction format supports a fair, efficient, and competitive capacity market by reducing gaming opportunities, limiting the possibility of tacit collusion, leveling the playing field between incumbent and new market participants, providing clear and accurate price signals, and incentivizing cost-based supply offers.

4.5 Auction Clearing and Price-Setting

Input from Working Group Members and Industry Stakeholders through SAM 3.0:

- The WG reached directional alignment that the objective function used to clear the capacity market auction should target maximizing social surplus.
- The price setting method was not determined but the group was not supportive of a UK clearing approach where price is set at the highest priced supply offer cleared rather than where the supply and demand curve intersect. The concern being that when the supply curve is below the demand curve the price could be set at the last offer price rather than the price which would be set by the demand curve at that level of procurement.

Comparison to SAM 3.0 Position:

- The design is not materially different from what was described in SAM 3.0

AESO Rationale:

The social surplus-maximizing clearing algorithm is the most common clearing algorithm among all existing capacity markets, with the exception of the UK.[10] Maximizing social surplus will result in the most efficient long-term price signals which should provide the most efficient resource mix and lowest societal costs over time. This approach is also consistent with the clearing approach used in the current AESO energy market.

[9] See ISO-NE discussion, https://www.iso-ne.com/static-assets/documents/2016/07/20160711-dca-v-sealed-bid.pdf.

[10] In the UK, if the lump offer is marginal, it is only cleared if doing so economically benefits customers. May result in lower short-run customer prices in some cases, but less efficient resource selection will increase prices over the long term.

Under a different clearing algorithm this may not be the case. For example, in the UK, if the inflexible block is marginal, it is only cleared if it is beneficial to the customers. Figures 1 and 2 illustrate examples where this clearing algorithm does not maximize social surplus. Under the UK clearing algorithm, the auction clears at P_1 and Q_1 in Figures 1 and 2 as shown in the graphs on the left.[11] In these situations the clearing algorithm would have the AESO purchasing less capacity than its target purchase level. While this procurement level would still be above the level which would cause reliability concerns over time the AESO is concerned that it may systematically purchased less capacity than its target purchase levels.

For example, in Figure 1 if the market had cleared at P_2 and Q_2, social surplus would be larger. In the graph on the right of Figure 1, the green triangle is larger than the red triangle, and thus there is additional social surplus by clearing at P_2 and Q_2; social surplus being the difference between the two triangles. In the graph on the right of Figure 1, the green triangle indicates the additional social surplus by clearing P_2 and Q_2. In the graph on the left of both Figures 1 and 2, if Area A is bigger than the net social surplus gain, a net loss in consumer surplus may occur in the auction. Maximizing net consumer surplus instead of maximizing social surplus would clear the market at P_1 and Q_1 instead of P_2 and Q_2.

Figure 1: Illustration – Maximizing Customer Benefits: Clearing at the Block Below the Inflexible Block

Inflexible Block Does Not Clear (Area A > Area B)

Potential Addition Social Surplus

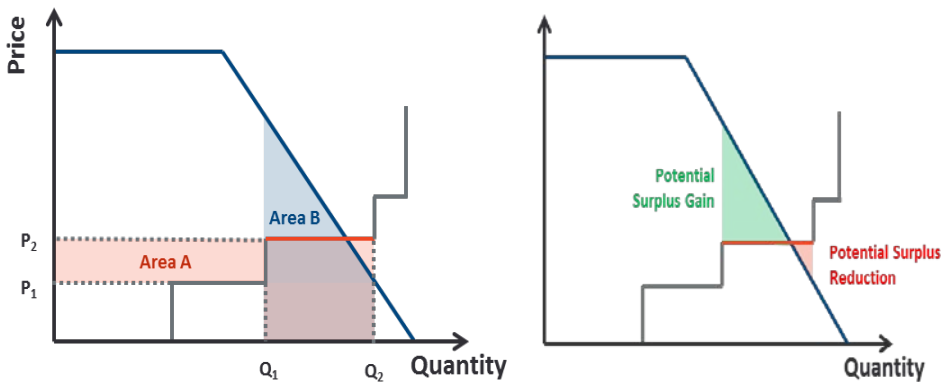
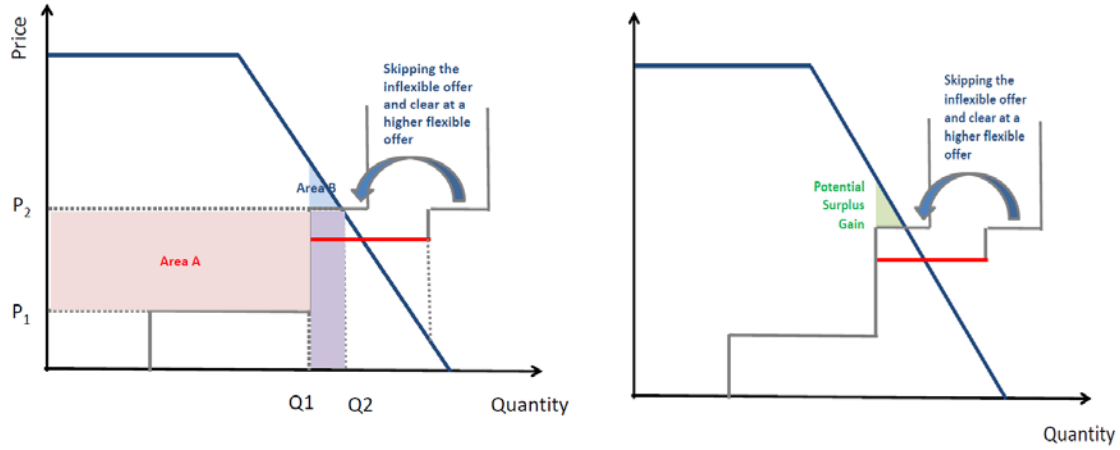


Figure 2: Illustration – Maximizing Customer Benefits: Not Clearing at the Flexible Block Above the Inflexible Block

The Flexible Offer above the inflexible Block Does Not Clear (Area A > Area B)

Potential Addition Social Surplus



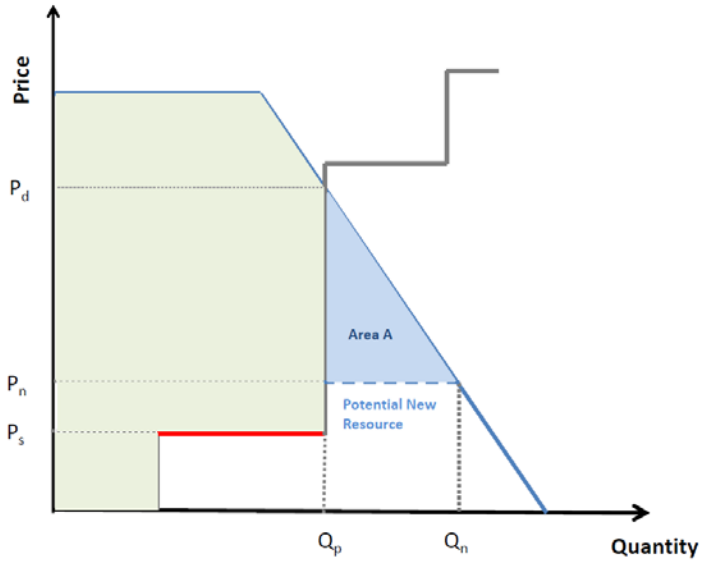
By clearing at $P_{1,}$ and Q_1 consumer surplus is maximized, but this reduces the effectiveness of the price signal by creating no market incentive for new supply resources that could offer between P_1 and P_2. Instead, when social surplus is maximized in the clearing algorithm (auction clears at P_2 and Q_2), a more accurate price signal is provided compared to a clearing algorithm that maximizes consumer surplus only. Maximizing social surplus would attract new supply resources to enter the market at price levels between P_1 and $P_{2,}$ providing more capacity at a lower price.

Price setting:

The AESO proposes to set the capacity market clearing price at the demand curve when the entire supply curve is below the demand curve, or when the entire procurement volume is below the demand curve. Setting the clearing price at the demand curve enables the price to reflect the market's value of additional capacity. Although it does not lead to the lowest procurement cost in one particular auction, it does provide price signals to support the efficient entry of additional, lower-cost capacity resources over time. When the clearing price is set at the demand curve, (P_d) in Figure 3, it provides an strong price signal for new or additional resources to enter the market during the next auction. In the example below, the new resource enters at P_n (indicated by the teal line in Figure 3), leading to additional social surplus (denoted by Area A) in the long run.

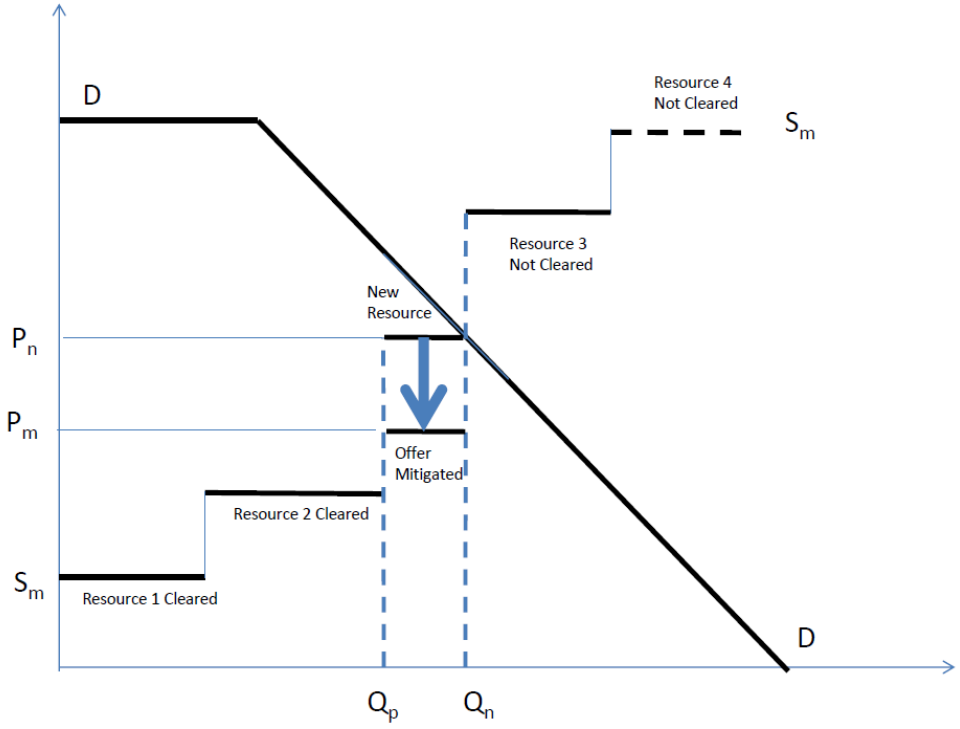
If the clearing price was set at P_s instead of at the demand curve (P_d), this would result in a lower price but would not provide the price signal the new resource may need to enter the market. Over the long term this could lead to inefficient outcomes and reliability issues due to under procurement.

Figure 3: The Supply Curve of Selected Resources Lies Below the Demand Curve



Setting the market price at the demand curve also prevents a situation where the entry of a new resource in one auction can cause the market clearing price to collapse in the following auction (when it is the marginal unit, and there is no change in market supply and demand). This feature helps to ensure the overall market structure is attractive for new investment. Figure 4 illustrates a scenario assuming a new resource enters the market and sets the clearing price at P_n in its first auction and as it transistions to being an existing resource in subsequent auctions it reduces its offer price to P_m due to lower going forward cost and, potentially market power mitigation. As illustrated in Figure 4, if the supply and demand remain the same, and the resource offers at price P_m in future auctions after recovering some of its fixed costs in earlier auctions, the market price would drop from P_n to P_m if the market price is set by the the marginal offer instead of the demand curve, even though there's no change in market supply and demand. This would discourage future resources from entering into the market if they can offer at a price between P_n, and P_m. However, when the price is set at the demand curve, the market price in the subsequent auction would stay at P_n; correctly reflecting the fact that there is no change in market supply and demand and providing accurate price signals to other supply resources

Figure 4: Illustration – Price Set by Demand Curve Avoid New Entry Causing Price to Collapse



4.6 Addressing Intertie Transmission Constraints

Input from Working Group Members and Industry Stakeholders through SAM 3.0

- WG members pointed out that Alberta is an unconstrained transmission system and with a three year forward period there should be sufficient time to build out of the constraint.
  - There are no firm transmission rights in Alberta.
  - An additional alternative to explore could be assessing the incremental cost of transmission vs. the incremental cost of capacity.
- The working group discussed how the market should address transmission constraints, were it to occur in the future, and generally agreed that price should be the first determination to prorate transmission to participants

Comparison to SAM 3.0 Position:

- The design is not materially different from what was discussed during working group sessions (but not formally noted in SAM 3.0), however the working groups discussed that having an unconstrained transmission system in Alberta would suggest that the province would build its way out of any congestion issues without having to impact market participants.

AESO Rationale:

Section 2.3 discusses how capacity volumes are determined for individual external capacity resources. Alberta has limits on the amount of capacity that can be delivered through interties. Joint intertie scheduling limits will be determined and made available as part of the overall auction process. There may be auctions in which there are more qualified external capacity resources than there is available import capacity when joint scheduling limits across multiple interties are considered. For example, transmission

delivery constraints may be observed for capacity sellers on the Alberta–BC Intertie and Montana–Alberta Tie-line. The constraints will be a result of the combined flow limit on those two interties. The unforced capacity (UCAP) volumes of the external capacity resources will not be reduced to reflect the level of the joint scheduling constraint because this may result in an inefficient outcome where the higher cost resources are cleared prior to fully utilizing the lower cost resources.

Clearing lower-priced resources first, results in a more efficient outcome and lower costs for consumers. Considering overall social surplus in situations where offers are priced the same also results in more efficient outcomes.

4.7 Addressing Internal Transmission Constraints

Input from Working Group Members and Industry Stakeholders through SAM 3.0

- The WG members pointed out that Alberta is an unconstrained transmission system and with a three-year forward period there should be sufficient time to build out of the constraint.
  - There are no firm transmission rights in Alberta.
  - An additional alternative to explore could be assessing the incremental cost of transmission vs. the incremental cost of capacity.
- The working group discussed how the market should address transmission constraints, were it to occur in the future, and generally agreed that price should be the first determination to prorate transmission to participants.

Comparison to SAM 3.0 Position

- The design is not materially different from what was discussed during working group sessions (but not formally noted in SAM 3.0), however the working groups discussed that having an unconstrained transmission system in Alberta would suggest that the province would build its way out of any congestion issues without having to impact market participants.

AESO Rationale:

Alberta's transmission system is designed to support unconstrained operations under system-normal conditions. It should be noted, however, that transmission development timelines can often extend beyond three years when considering regulatory approval and construction timelines. Development cycles of five to seven years are not uncommon. While constraints are not anticipated, any potential transmission constraints will need to be accounted for when clearing the capacity market so that the AESO does not procure volume that cannot be delivered. This would fail to provide value to customers and would not meet reliability requirements.

While not expected to occur, if there are anticipated transmission constraints in the Alberta interconnected system that could affect capacity market offers from qualified participants, the AESO will identify the location and implication of any transmission constraints so that participants have full information with which to form their offers.

UCAP volumes of available resources behind a transmission constraint will not be adjusted to reflect the limit of the transmission constraint. Doing so could result in the capacity market clearing some volume of the higher-priced resource prior to clearing all of the lower cost resource. Clearing lower-priced resources first results in a more efficient outcome and lowers costs for consumers. Resources compete for capacity sales based on their price structure. This competition promotes a fair and efficient market that treats all resources equally provided they meet the eligibility criteria. Considering overall social surplus in situations where offers are priced the same also results in more efficient outcomes.

4.8 Forward Capacity Auction assessment against Capacity Market Design Criteria

Adopting a sealed-bid, single-round auction with a three-year forward period and a one-year delivery period for all participants promotes a capacity market that is fair, efficient, and openly competitive, employs a market-based mechanism that incents competition in a transparent fashion, and should result in a well-defined product and an effective and efficient capacity price signal. The one-year term for the capacity obligation is as short as possible and satisfies the design principle that investment risk should continue to be borne by investors.

The auction design considers Alberta's unique approach to import and transmission constraint management by creating single price for capacity regardless of location. This is a simple and straightforward initial implementation. While it is not completely consistent with the best practices and lessons learned from other capacity market implementations, it is the design that best fits the needs of Alberta.