SAM 3.0 Stakeholder Comment Matrix

The AESO welcomes stakeholder input on the working group provisional recommendations and discussion context contained in Section 5 of SAM 3.0.

Please review the following instructions and submit your feedback to capacitymarket@aeso.ca no later than 3:00 p.m. on Friday, Dec. 15, 2017.

The AESO will post all feedback "as received" on www.aeso.ca by Dec. 20, 2017. Please note that the names of the parties submitting each completed comment matrix will be included in this posting. Please also note that the AESO will not be responding to individual submissions.

Instructions:

- Stakeholders are encouraged to provide all feedback on SAM 3.0 within this document only.
  - If it is necessary to submit additional supporting documentation, please clearly indicate which design question, conclusion, discussion note or stakeholder comment your document refers to. No handwritten comments will be accepted.
- Input your name, organization you are representing, and feedback in the comment boxes below each key design question.
- Your contact information is requested in each section for ease of sorting and compiling feedback from all stakeholders.
  - Press Shift + Return to enter paragraph breaks within a comment box.
  - Comment boxes will automatically expand if additional room is required for feedback.

If you have any questions about this comment matrix, please email capacitymarket@aeso.ca

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Eligibility *Who can provide capacity? How much can they provide?* Working Group (WG): ***Eligibility & Capacity Value Determination***	**SAM 1.0 Starting Points** • All eligible capacity must offer into the capacity auctions. • Eligibility will allow all new and existing supply resources to offer their approved unforced capacity (UCAP) into the capacity market. • Renewable Electricity Program (REP) Round 1 will not be eligible to participate in the capacity market however their capacity volumes will be reflected in the demand curve calculations. Future REP rounds will need to be evaluated based on contract. • Carve-outs by technology will not be allowed. • Demand resource may participate by bidding into the capacity market as part of the demand curve. • Import terms for participation must be examined. Export will not be eligible. • Deliverability will be a single zone. If a deliverability constraint is identified prior to the auction, resources in the constrained area will be selected by offer price. **SAM 2.0 Working Group Conclusion** • UCAP MW should be used to represent capacity when determining capacity values.	• Aggregation: resources should be eligible to aggregate when participating in the capacity market. • Minimum resource size: resources 1 MW and greater should be eligible to participate in the capacity market. • UCAP: UCAP should be used to represent capacity when determining capacity values. • Demand resource participation: demand response resources and price responsive load should be eligible to participate in the capacity market. • Interties: resources external to Alberta should be eligible to participate in the capacity market. • Storage: storage resources should be eligible to participate in the capacity market.	• Aggregation: WG unanimously supported that resources should be eligible to aggregate when participating in the capacity market provided one of the two conditions are met: aggregation allows the UCAP of the combined resources to be higher than the UCAP of each individual resource, and aggregation allows the resources to meet the minimum size threshold in the market. The WG agrees that resources behind a single meter may aggregate to form one capacity supply resource. • Minimum resource size: WG unanimously supported resources 1 MW and greater participating in the capacity market. Resources 1 MW to less than 5 MW are eligible to participate on a "may offer" basis; resources 5 MW and greater "must offer" into the capacity market. • UCAP: WG unanimously supported UCAP being used to represent capacity values, with reservations related to flexibility related to behind-the-fence generation, subject to appropriate performance and penalty mechanisms and subject to reasonable data requirements for new assets. • Demand resource participation: WG unanimously supported demand response resources and price responsive load being able to participate in the supply side of the capacity market. Additionally, the WG was directionally aligned that supply side demand response should allow participation based on "down by" and "down to" approaches (for further details, please see Eligibility working group presentation, Oct. 24, 2017). While not discussed in SAM 3.0, the WG would still consider demand resource participation on the demand side of the market as outlined in the AESO's SAM 1.0 position. The WG did not vote on demand response participation on the demand side of the market given the uncertainty related to cost allocation and would consider that resource participation once the approach to cost allocation is resolved. • Interties: WG unanimously supported resources external to Alberta participating in the capacity market. WG recognized that the obligation for interties to "must offer" in the energy market will need additional consideration. • Storage: WG unanimously supported storage resources as eligible to participate in the capacity market.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
			• The WG was generally aligned with supporting the inclusion of all resource types noted above provided they all met common criteria: – UCAP MW being fungible across all resource types. – Common performance expectations and penalties. – Must offer requirements that are comparable across resource types while recognizing the differences between resources. • Who calculates UCAP? – The WG generally agreed that the AESO should be the calculating agent for calculating UCAP subject to: having access to the appropriate data, having an agreed-to performance penalty framework, a process for market participants to resolve UCAP value disputes and an agreed-to methodology for UCAP determination. • Delisting (temporarily removing an asset from the capacity market, mothballing or asset retirement): The WG generally agreed that delisting should not occur for reasons to exert market power. The timing of announcements should be made with time for the market to react to the delisting information. • Performance exemptions: The WG generally agreed that neither forced outages and derates nor planned outages, would be eligible for capacity market performance exemptions. • Energy efficiency: WG did not reach a recommendation on energy efficiency. Additional information regarding eligibility and performance measurement is required.

Name: Matthew Davis **Organization:** ATCO

Feedback: As a participant in the Eligibility working group, ATCO was generally supportive of the working group's recommendations but notes that the discussion context failed to reflect reservations that ATCO and other participants expressed within the working group process. ATCO would like to provide additional comments on the following:

Minimum Resource Size: ATCO believes the working group recommendation is a positive move that will support the development of smaller, distributed connected generation, community generation, and microgeneration. Clarity is necessary on whether the 1 MW threshold is 1 MW of installed capacity, or 1 MW of UCAP. This could have significant implications for resources that would be assessed low capacity values. As such, ATCO believes that the 1 MW threshold should be on installed capacity to maintain fair treatment among supplier types.

UCAP Determination: ATCO agrees that the AESO is best situated to calculate UCAP values so long as there is a reasonable, timely, and fair dispute resolution process in place should there be issues. Overall the expectation is that UCAP will be fungible and therefore the calculation of UCAP should be reasonably consistent across various resource types, and commensurate with the AESO's resource adequacy modelling. It is noted that in the working group process the AESO has admitted that the current method used to capture outage data may not be sufficient for UCAP calculations. ATCO would expect that the AESO would consult fully should changes to outage reporting requirement be pursued to correct this limitation.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context

Interties: ATCO believes that interties should be eligible to participate in the capacity market so long as they are subject to fair and equitable treatment as internal resources.

Storage: ATCO agrees with the working group conclusion that storage should be eligible for participation in the capacity market. The determination of a storage asset's UCAP should reflect its energy to power ratio to accurately represent the contribution to resource adequacy.

Performance Exemptions: While a formal vote to arrive at a provisional recommendation was not held, ATCO views that the directional indication from the working group to not allow exemptions for planned maintenance outages was made without sufficient information. ATCO notes that in other jurisdictions reasonable and necessary planned maintenance is provided an exemption from penalties.[1] Further, to reliably provide the resource adequacy product that the AESO is purchasing on behalf of consumers, regular maintenance is necessary to ensure unit availability and safe operations. When, and for how long an outage is required will vary depending on how long the asset has operated, where in its maintenance cycled it is, and how frequently it is cycled. Not allowing for planned maintenance outages may result in the incorrect signal to generators to limit their maintenance outages which, as facilities age, will result in more frequent and pro-longed outages or in the worst case, early retirement; all of which have a negative impact on the system, and on customer costs.

[1] ISO-NE allows market participants to indicate, at the time of submitting an outage, if the planned outage is to be considered exempt. This can be found in the ISO New England Inc, Markets, and Services Tariff in III.13.7.1.1.4(b) found here: https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_3/mr1_sec_13_14.pdf (pdf page 186). In PJM, any MWs of capacity that were not scheduled by PJM are exempt from non-performance charges. This can be found in PJM Manual 18: PJM Capacity Market, Section 8.4A – Non-Performance Assessment found here: http://www.pjm.com/-/media/documents/manuals/m18.ashx (page 170).

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Cost Allocation *How will capacity costs be allocated?* Working Groups (WG): ***Eligibility & Capacity Value Determination*** ***Procurement & Hedging***	**SAM 1.0 Starting Points** • Capacity costs will be considered separately from wires and ancillary services costs, and all customers will continue to face wires and ancillary services costs. • Cost allocation will consider energy usage at system stress performance periods and coincident peaks. • Customers can hedge capacity costs through financial methods. **SAM 2.0 Working Group Conclusions** *n/a*	*No recommendation*	• The AESO did not pursue further discussions on cost allocation by either the Eligibility or the Procurement and Hedging WG, deferring this discussion to the Alberta Energy stakeholder engagement process. • As noted in the SAM 2.0 summary, the Eligibility WG is supportive of cost allocation approaches that are aligned with the principles of cost causation and efficient market signals and that capacity costs should be considered separately from wires and ancillary services costs. Further, many WG members generally prefer capacity costs flowing through retailers.

Name: Matthew Davis, Erika Goddard **Organization:** ATCO

Feedback: ATCO plans to submit further comments on this topic as part of the Government of Alberta's consultation on cost allocation. These comments focus on ensuring that the cost allocation methodology is efficient (based on principles of cost causation), equitable (avoids unintended consequences and cross-subsidization across rate groups), and supports competition (in the wholesale energy and retail markets). A fundamental of any electricity market is the interdependency between supply and demand. The product being procured in the capacity market and the periods that the AESO is procuring for should be clearly defined. This will influence cost allocation design. It is important to remember that the benefits of a capacity product are not just realized during scarcity/shortfall events, but capacity is also necessary for the regular operation of the Alberta electricity market. For these reasons, it is possible that there are realized efficiencies from linking cost allocation to performance periods so that the same period that a supplier is being assessed for performance, the demand side is being allocated costs. Aligning cost allocation with supply cushion tightness or scarcity also reflects principles of cost causation. This concept was recognized as a starting point in SAM 1.0 and remains true after discussions and conclusions on interrelated design elements have been reached in SAM 3.0. While cost allocation has been removed from the AESO's purview, the possibility that cost allocation and performance framework could be linked should be considered.

In terms of capacity cost recovery, ATCO strongly supports capacity costs being recovered through the retailer. To ensure that competitive forces are maintained throughout Alberta's electricity market, the capacity cost recovery method should recognize the importance of competition and customer choice. Through retail recovery, consumers will be able to choose options that would hedge their costs. This position is further supported by the policy directives provided by Alberta Energy, specifically that competitive forces will determine outcomes and that consumers will continue to be able to choose their electricity retailer.[2] The Government is clear that the introduction of the capacity market should not impact retail choice. Therefore, capacity costs must be recovered through the retailer to ensure that competitive retail products remain a part of Alberta's electricity markets.

[2] Alberta Department of Energy. "Powering Alberta's Future: Policy Direction for Alberta's Capacity Market Framework." August 15th, 2017.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Performance Assessments *How do we know that capacity has been provided?* WG: ***Eligibility & Capacity Value Determination***	**SAM 1.0 Starting Points** • Performance will be measured during capacity performance periods established at system stress conditions starting near to declaration of Energy Emergency Alert (EEA) 1. Thresholds for warning notification and performance period start notification will be defined and information will be communicated on a new supply adequacy report to be determined. A pay-for-performance program will be established where under-performers will compensate over-performers on a revenue neutral basis. • Performance penalties will be a multiple of net-cost of new entry (net-CONE). **SAM 2.0 Working Group Conclusions** *n/a*	*No recommendation*	• The WG reached directional alignment that additional performance testing periods be considered to mitigate the concerns associated with performance measurement occurring only during EEA events. If penalties are applied only to performance during EEA 1-3 events, there was concern that the randomness and infrequency of the performance period could result in a penalty framework that was difficult to manage, would not incent the appropriate behaviour, and could increase capacity costs. • A majority of WG members agreed: – There is a need for a penalty framework. – Increasing the number of performance measurement events will recognize the uniqueness of the Alberta market and make penalties more manageable. – Non-EEA event performance should be measured on resource availability (where "availability" means that the resource is available for energy market dispatch).

Name: Matthew Davis **Organization:** ATCO

Feedback: ATCO was appreciative that the AESO could arrange additional discussion on this topic outside of the scheduled working group process. This helped address our previous concerns that there was insufficient time allotted to such an important topic. ATCO believes that the AESO's original position of performance being measured only during EEA events would have created:

- The potential for higher capacity costs due to higher risk premiums being included in capacity offers;
- Little incentive for improving reliability as events are infrequent, at random, and a result of forces generally outside of a supplier's control; and,
- A framework that failed to recognize Alberta's uniqueness.

As such ATCO is supportive of the directional indication that the working group arrived at. ATCO would note that additional discussions are necessary on what, in addition to EEA events, will constitute a performance period, and how availability will be measured, particularly as it relates to long-lead time units. Given the recommendation for the current practice of self-commitment to continue, the AESO must provide sufficient information for suppliers to make well informed decisions.

ATCO believes that the performance framework should be used to verify that consumers received the level of capacity (UCAP) that they purchased. As such, measurement over additional periods would better reflect that capacity is necessary throughout the year.

The topic of penalty exemptions for planned outages should be revisited in the context of a new performance framework. In the working group meeting suggesting revision to the SAM 1.0 penalty framework, one proposal suggested including planned outages as part of the UCAP determination, while an alternative suggested that planned outages receive an exemption from penalties. Outage planning and performance framework (including both methodology and penalty amount) need to be discussed in tandem.

Finally, ATCO is concerned that a poor design of the performance framework could mute energy price signals and create unintended consequences. As such, this topic needs careful consideration including its interdependencies with both energy market issues and capacity auction rules (such as inclusion of risk premium in a capacity offer, ability to submit multiple blocks).

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Term *How long will the capacity delivery period be?* Working Group (WG): ***Market Mechanics***	**SAM 1.0 Starting Points** • One year, non-seasonal commitment period for all assets. **SAM 2.0 Working Group Conclusions** • One year (or one season if a seasonal product is chosen) commitment period for all assets. • The obligation period should not vary based on resource type or vintage.	• The obligation period will be one year (non-seasonal).	• The WG recommended that the obligation period will be one year for all resource types. 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. There was considerable discussion regarding this key design element and the recommendation was passed with eight votes for and six against. Those who voted against the recommendation preferred a seven-year obligation period for new assets. They were concerned that a one-year obligation period 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.

Name: Matthew Davis **Organization:** ATCO

Feedback: ATCO was not a member of the working group where this topic was discussed but does view it to be a key decision. The length of the obligation period is an important factor when considering the broader goals of the capacity market design. ATCO agrees with the principle of equitable treatment for both incumbent and new generation but does acknowledge that it may be difficult to make significant investments with only a single year term. ATCO believes that the obligation period within the market design should be revisited as the needs of the market evolve and change over time.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Obligation to Procure *Who will buy the capacity?* Working Group (WG): ***Procurement & Hedging***	**SAM 1.0 Starting Points** • In general, the AESO will hold the obligation to procure capacity on behalf of load. • The AESO as a central agency will procure capacity to meet load needs net of self-supply. • Loads with behind-the-fence (BTF) generation will be treated as a net-to-grid combined facility, and as such can opt-out of capacity charges if they continue to operate as a combined facility. Financial incentives will encourage load consumption to be aligned to generator availability. • Physical bilateral procurement is not allowed. **SAM 2.0 Working Group Conclusions** • While expected to be a policy direction, in general, the WG concluded that the AESO will hold the obligation to procure capacity on behalf of load. • Physical bilateral procurement (as currently defined) is not allowed.	• The AESO will hold the obligation to procure capacity on behalf of load. • The AESO operates an organized market with a centralized auction mechanism and standard product definition where capacity is exchanged through a centralized auction with a simple and transparent price. • Physical bilateral procurement of capacity is not permitted; however, a site may choose to self-supply capacity provided they meet the following requirements: 1. The load must be capable of being served in whole, or in part, by generation that is located on the same site and at the same point of interconnection to the electric system (includes industrial site designations (ISD) and duplication avoidance tariffs (DAT)). 2. Sites with onsite generation that cannot physically flow their gross volumes due to system connection limitations must self-supply. 3. Sites with onsite generation and no connection flow limitation can choose to self-supply with the following conditions: • The site must have a bi-directional net interval meter at the connection to the electric system. • Must be a pool participant. • Onsite generation (gross) must meet the minimum eligibility requirements for capacity resources (i.e., size, project milestones for new resources).	• The AESO holding the obligation to procure was supported unanimously by the WG with minor reservations with the terminology used in the recommendation itself, and conditional on seeing the comprehensive design. • Having the AESO operate an organized market for capacity was unanimously supported by the WG with a couple of reservations regarding the treatment of self-supply and the comprehensive design. • Facilitating capacity net-settlement instructions (NSI) was unanimously supported by the WG with a reservation regarding the cost/benefit of including this element in the design. • Disallowing physical bilateral procurement was supported by majority of the WG with reservations around the terminology used in the recommendation. – WG definition of physical bilateral procurement is as follows: • Physical bilateral capacity procurement is a contractual arrangement between a load market participant and a specific named capacity resource utilizing the transmission or distribution system for physical delivery of all or a portion of the load's capacity needs. – WG definition of self-supply is as follows: • Self-supply is load served by generation located on the same site at the same point of interconnection to the electric system, including when the site is an ISD, or under a DAT.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
		4. Self-suppliers can be connected to either the transmission system or the distribution system provided they meet the requirements listed in item 3 above. 5. Self-suppliers who intend to change from participating on a net basis to a gross basis or from a gross basis to a net basis must declare their intention to make this change prior to the base auction for the delivery year. • This would not limit new resources' participation in rebalancing auctions. • With the assumption that the overall adequacy requirement will be based on Alberta Internal Load, the target procurement volume will be equal to the adequacy requirement minus the volume of self-supply in the delivery year. • Cost will be allocated to self-supply net load according to the cost allocation method developed. Self-suppliers will not be assessed a load obligation (see definition in discussion context) provided the cost allocation methodology adequately addresses potential fairness issues that may result from self-suppliers failing to adequately self-supply during performance events.	• A load obligation is defined as a requirement placed on load to not consume beyond a certain level, otherwise be subject to curtailment, penalties or additional costs. Placing an obligation on load and the consequences of exceeding the obligation was discussed extensively by the WG. • Directional alignment was achieved on unforced capacity (UCAP) calculation for self-suppliers. The UCAP for self-supply sites with installed capacity of onsite generation greater than their total load should be determined based on effective load carrying capability. – WG expressed concerns with the complexity and lack of transparency with the approach; however, felt it represented the best way to determine UCAP for these types of sites. – Further exploration of this option is required and should investigate whether a simpler process could proxy for full-blown effective load carrying capability modelling.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context

Name: Njoroge Ngure, Matthew Davis **Organization:** ATCO

Feedback: ATCO appreciated being a member of the procurement and hedging work group and would specifically comment on the following:

Obligation to Procure: Because the AESO is the operator of the wholesale energy and AS market, ATCO is supportive of the AESO taking the added obligation to procure capacity. This is consistent with the policy direction provided by the Government.[3] The addition of a capacity market is a significant change to the industry framework. As such, it will create additional administrative elements in the market, and elevate the AESO's role as it becomes the sole purchaser of capacity (on behalf of consumers) and developer of key capacity market parameters (such as resource adequacy modelling and the demand curve). These changes necessitate a revised and more formalized approach to stakeholder input. As the capacity market is intertwined with the energy and ancillary services (AS) markets, ATCO believes that market participant consultation should be improved through a more formalized committee structure, and not just for the capacity side of the market, but also for the other markets. This practice in other jurisdictions is common when the system operator has this kind of responsibility.

Physical Bilateral Procurement: ATCO agrees that bilateral arrangements, where participants connected to transmission or distribution system are exempt from the capacity market, should not be allowed. Allowing such arrangements would erode the advantages of a centralized market where participants compete to provide capacity, an undesired and sub optimal outcome.

Self-Supply: ATCO agrees that there are legitimate reasons for market participants to pursue capacity self-supply, and this should not be unnecessarily hindered. ATCO, however, cautions that a flawed market design including skewed cost allocation can lead participants to choose self-supply when it would be more efficient to rely on the market. Government, industry stakeholders, and consumers are best served by a reliable and resilient electricity system with reasonable costs for electricity. It is paramount that the cost to supply, deliver, and operate the electricity system is recovered in a manner that continues to support consumption from our electricity grid and does not provide unnecessary incentives to abandon the Alberta electricity market. ATCO also agrees with the list of technical requirements and participants' conditions for self-suppliers, including the requirement to declare intentions ahead of capacity auctions. ATCO supports the assessment of UCAP based on the electrical load carrying capability (ELCC), similar to that of intermittent resources, and others. This supports the ability for UCAP MWs to be fungible. Further discussion about the AESO's ability to calculate ELCC should be included in the upcoming comprehensive market design, not just for self-suppliers, but for all resource types.

While load obligation was discussed, the working group did not reach a recommendation or directional alignment. Without an understanding of the penalty structure, the conclusions and suggestions contained in SAM 3.0, regarding the obligation and consequences of load consuming beyond a certain level were not exhaustively discussed by the working group.

[3] Alberta Department of Energy. "Powering Alberta's Future: Policy Direction for Alberta's Capacity Market Framework." August 15th, 2017.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Capacity Market Settlement *How will capacity providers be paid?* Working Group (WG): ***Procurement & Hedging***	**SAM 1.0 Starting Points** • Credit will be required for capacity value both on load and new supplier side. • Net settlement will be facilitated against contract for differences (CfD) hedges. • Penalties will be collected as part of settlement cycle. • Settlement will continue on a monthly basis. **SAM 2.0 Working Group Conclusions** n/a	• The capacity market should facilitate capacity market net settlement instructions within the design of the market.	• Some items within the topic of settlement (e.g., settlement, billing, credit) were not scheduled for the SAM 3.0 development cycle.

Name: Njoroge Ngure, Matthew Davis **Organization:** ATCO

Feedback: ATCO agrees that the capacity market should facilitate capacity net settlement for participants who choose to register financial hedges with the AESO. The method by which capacity costs flow through to customers was not part of the SAM 3.0 discussion; however, ATCO supports credit requirements for both new capacity and load. As previously stated, ATCO believes that capacity costs should be recovered through the retailer or the wholesale customer (self-retailer/market participant) to ensure competitive forces drive market outcomes.

Alberta's competitive retail market is able to support the capacity market implementation. Competitive retail could be further be enhanced if the Government of Alberta eliminated the Regulated Rate Option (RRO) as per the 2012 Retail Market Review Committee recommendations; competitive retailers already offer options to consumers to manage energy costs and can and will do the same for the capacity costs.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Market Mechanics *How will the capacity market work?* *When and how often will capacity be purchased?* Working Group (WG): ***Market Mechanics***	**SAM 1.0 Starting Points** • Centralized capacity market. • Single price sealed-bid auction. • All eligible existing resources must offer and their offers must be below a maximum offer cap. • Market power mitigation for capacity market offers will take the form of an offer cap applied to all existing resources. The capacity offer cap will be applied equally to existing resources as a fraction of Net-CONE of the reference technology. • No capacity offer floor. • Asset substitution allowed after rebalancing auction should supply resources be unable to meet their capacity obligation in the delivery year* ** This starting point was included with the Eligibility key design question in SAM 1.0* **SAM 2.0 Working Group Conclusions** • Centralized capacity market. • Existing and new resources will participate in a single auction. Separate auctions will not be held for new or existing resources.	**Recommendations** • Auction type: The auction should be a single round, sealed bid auction. • Forward period: The auction should be held three years prior to the obligation period. • Rebalancing auctions: There should be two rebalancing auctions.	• Auction type: The majority of 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. • Forward period: The WG unanimously recommended that the auction should be held three years in advance of the obligation period. • Rebalancing auctions: the WG unanimously recommended that there should be two rebalancing auctions with the second auction held as close as possible to the start of the obligation term. **Directional Alignment** • Market power: With respect to market power screening, the WG reached directional alignment that market power tests for capacity market offers should be completed on an *ex ante* basis. With respect to mitigation, the WG reached directional alignment that resource owners that are not pivotal should not have their capacity offers mitigated. Three approaches to capacity market mitigation were tabled: a) mitigation should be on a no-look basis at some fraction of net-cost of new entry (net-CONE); b) mitigation should be on a no-look basis at a fixed $/kW month; and c) a fixed $/kW level that would be applied to all auction participants, pivotal or not. Some group members suggested the $/kW month level be set at a price to allow incumbent assets to achieve fair compensationn for investments made under the energy-only market and avoid the consequences of early retirement. The WG agreed the three options should be further reviewed. Some members were concerned that capacity market power mitigation not be determined in isolation of energy and ancillary services market power mitigation. • Objective function: The WG reached directional alignment that the objective function used to clear the capacity market auction should target maximizing social surplus. This situation occurs when the auction clears on an indivisible offer block or when the entire supply curve is below the demand curve. The price setting method was not determined but the group was not supportive of a United Kingdom clearing approach where price is set at the highest priced supply

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
			offer cleared rather than where the supply and demand curve intersect. • Out-of-market payments: The WG was directionally aligned that out-of-market payments should be addressed prior to the auction clearing. For resources that are eligible to participate in the capacity market and receive an out-of-market payment that are new or have not previously cleared the capacity market, most group members favoured a minimum offer price 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. 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. • Flexibility: The WG was directionally aligned that the capacity market should not include a product that promoted generation flexibility/ responsiveness. As is generally done in other markets, flexibility needs should be addressed through the energy and ancillary services markets. • Asset substitution: The WG was directionally aligned that allowing asset substitution was good for the market by helping suppliers manage risk which should result in lower capacity market costs. The approach to managing performance risk should incorporate as much flexibility as possible and be allowed on an *ex ante* basis and possibly an ex-post basis, between market participants and between resource types.

Name: Matthew Davis **Organization:** ATCO

Feedback: ATCO was not a member of this working group. Based on our understanding from reviewing the materials presented for this working group ATCO has the following comments:

Market Power: ATCO submits that the subject of mitigation based on an ex-ante basis was not fully discussed in the working group; the discussion was around the inclusion of an ex-ante screen, not ex-ante mitigation. An ex-ante screen is a tool to assess and potentially lead to some form of mitigation (possibly including offer mitigation). It is important to emphasize that mitigation should only be used when the exercise of market power has a distinct and measurable impact on market outcomes. Mitigation from any other rationale could potentially lead to early retirements and increased total cost to the Alberta electricity market. ATCO agrees with the concerns of multiple parties that considerations regarding the market power mitigation framework should be considered across all markets (capacity, energy, and ancillary services) simultaneously to limit unintended consequences, and take into consideration the uniqueness of the Alberta market.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context

Out-of-market payments: There are a number of out of market funding sources available, and appear to be an increasingly influential aspect of future innovation and generation development in Alberta.[4] Consequently, a minimum offer price approach needs to developed. ATCO suggests the logical conclusion is that efficient signals in the capacity market should be maintained with as little distortion as possible from out-of-market payments. ATCO submits that assets receiving out-of-market payments should be treated in a way that limits distortion and maintains equitable outcomes for those units not receiving out-of-market outcomes. A level playing field in the capacity market requires considering the impacts of efficiency subsidies and government programs (e.g. REP).

The definition of an out-of-market payment does not need to be complicated, if a stream of revenue is subsidizing an asset's involvement in the electricity market it is an out-of-market payment. A government subsidy or payments from a government program that are provided directly to the asset is the textbook example of an out-of-market payment and should be subject to a minimum offer price.

Flexibility: If the goal is to incent flexibility through the energy and ancillary service markets, the market power mitigation framework becomes more important. An overly mitigated market will do very little to incent, and more likely hinder, the incentive for assets to provide flexibility/responsiveness. ATCO is supportive that incentives for flexibility remain outside of the capacity market in order to maintain the approach that all units of capacity are fungible.

[4] Some examples include: Renewable Electricity Program first auction being excluded from REP. Government of Alberta. "Major funding for diversified, low-carbon economy." December 5th, 2017. Discussion on Energy Efficiency Alberta (government funded agency) participation in the market held in the AESO's eligibility working group.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Resource Adequacy Requirement *How much capacity needs to be procured?* Working Group (WG): ***Adequacy & Demand Curve Determination***	**SAM 1.0 Starting Points** • Assumption: Government will set a physical resource adequacy requirement with target values established for expected unserved energy (EUE) and loss of load hours (LOLH). • Target capacity volume established based on probabilistic resource adequacy requirement and considerations for supply adequacy impacts of resources regardless of their capacity market eligibility. • Downward sloping, convex demand curve with price cap at greater of gross-cone or pre-determined multiple of net-cost of new entry (net-CONE). • Capacity target creates inflection point at price of net-CONE. • Minimum and maximum capacity volumes with (target – minimum) < (maximum – target). **SAM 2.0 Working Group Conclusions** • Recommendation regarding the resource adequacy criterion and the reliability measure to be used is not requested from the WG; expected to be a government policy decision. However, the WG wishes to provide input into the criteria decision process, either through a separate consultation process or the WG process. • Target procurement volume to be based on probabilistic resource adequacy requirement modelling considering supply adequacy impacts of all resources regardless of their capacity market eligibility; details will be reviewed through the WG.	• A set of methodology and inputs for the resource adequacy modelling has been reviewed and approach accepted by the WG; continued transparency is requested in the ongoing consultation process. • The capacity market will have an annual reliability requirement and delivery period instead of a seasonal requirement.	**Annual vs. Seasonal Requirements** • WG evaluated seasonal and annual reliability requirements and delivery periods in detail. Both alternatives were viewed as feasible options, each with various complexity and trade-offs. The annual recommendation was reached with reservations regarding unforced capacity (UCAP) calculation, penalty treatment and the need to revisit the decision within the context of a comprehensive market design. **Reliability Requirement** • WG members reviewed the proposed methodology and inputs including a load forecast methodology that the AESO is considering for its reliability modelling. Feedback has been provided and adjustments to some aspects have been made. The proposed approach, methodology and inputs, excluding the load forecast methodology, were reviewed and accepted by participants with some reservations. Some written feedback on the load forecast methodology was received from WG members. The AESO is seeking feedback on the load forecast methodology proposed in the WG. To review this methodology, please visit aeso.ca • WG members provided feedback on the resource adequacy criterion through the Alberta Energy's (AE) resource adequacy engagement directly. **Governance** • Independence, stakeholder engagement, and appropriate governance were all noted by the WG to be important considerations for the design of and ongoing management of the capacity market and the establishment of the demand curve. WG members, excluding the AESO representative, also submitted a report to AE in its consultation process on stakeholder involvement for the capacity market.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
	• Demand curve will be downward sloping. • Demand curve should have the appropriate governance and oversight (how is to be determined).	• A set of demand curve principles, which provide guidance on balancing resource adequacy, cost and volatility in the demand curve, was developed with the WG.	**Demand Curve Design** • The Brattle Group presented on the emerging results of an equilibrium analysis that tested various demand curve shapes for an Alberta market. The WG provided input and commentary to Brattle for consideration in the demand curves developed and tested in the equilibrium analysis. • Through this process three demand curves were developed as candidates to continue to be tested. Each curve is downward sloping, convex, and has price caps ranging between 1.6-1.9X net-CONE (or 0.5 gross-CONE, whichever is greater). • Further discussion is required on demand curve design with WG discussing the tradeoffs between a steeper demand curve (resulting in increased volatility), versus a more gradual demand curve (resulting in greater risk of over-procurement). The current candidate demand curves intersect the assumed target at 1.6-1.4X net-CONE and have a width between 2,900 MW-4,000 MW installed capacity from cap-to-foot. A floor of zero will be set in all cases at the foot of the demand curve. These candidate curves will go forward for the AESO's further consideration in its comprehensive design. WG members raised concerns of the right-shifted nature of all the candidate curves and their risk of over-procuring or over-paying for capacity and limiting dynamic pricing in the energy market. It was also noted that the effectiveness of the demand curve through the capacity market implementation and supply mix transition should be considered. **Net-CONE** • WG reviewed approaches to establishing the net-CONE for Alberta's capacity market. The WG reached directional alignment on the proposed approach to calculate gross-CONE specifically that it will be determined by a consultant report incorporating subject matter expertise in financing and developing power projects. The financing inputs are to consider Alberta's market context. • The group also reached directional alignment on the proposed approach that the reference technology should be selected based on criteria of most frequently developed (historically), most economic (lowest net-CONE), lowest capital cost (lowest gross-CONE), and shortest time to energization (development timeframe). Current analysis indicates that simple-cycle technology best fits these criteria.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
			• Overall, the WG is skeptical of the value of using historical information or forward Alberta electricity prices to predict future performance. There is directional alignment in using a forecast approach to determine the appropriate energy and ancillary service revenues applicable to the reference plant for the net-CONE calculation. The price forecast methodology remains to be determined; the options to do so were initially discussed.

Name: Kurtis Glasier, Matthew Davis **Organization:** ATCO

Feedback: ATCO appreciated being a member of the resource adequacy and demand curve work group and would specifically comment on the following:

Annual vs. Seasonal Requirements: ATCO agrees with the annual delivery period. It will be important to consider and evaluate this recommendation considering policy direction provided by the Government and a comprehensive market design. An annual reliability product is reflective of the annual term length, and allows for a simplification of the auction and rebalancing process. In the working group, the recommendation included discussions around performance penalties, ATCO sees distinct advantages to an annual product when the use of a balancing ratio is employed as part of the penalty treatment. ATCO also acknowledges the AESO's continued diligence in considering a delivery period that does not overcomplicate nor subject parties to unequitable results.

Reliability Requirements: The reliability modelling inputs and methodology recommendation is limited by the fact that the model has not been produced. ATCO expects that the model will be scrutinized and reviewed in comparable detail in the upcoming working group sessions associated with the consolidated market design. Many of the recommendations in this working group (i.e. seasonality, demand curve shape and determination, CONE study) rely on the reliability modelling that is currently pending by the AESO and third-party consultants. Once a reliability model has been reviewed and tested, ATCO expects that stakeholders that are members of the Technical Working Group will be able to evaluate the recommendations from this working group from a more informed position.

Net-CONE: The directional alignment for the proposed net-CONE study approach will require further discussion and scrutiny once results and assumptions are firm. The document that was produced seemed, to ATCO, a reasonable approach and ATCO was supportive of the AESO beginning this work using its proposed method. ATCO stresses the importance of financing assumptions in the development of gross-CONE. Canadian financing assumptions should be used; an approach that uses experience or assumptions closer to, or based off, US financing will lead to erroneous conclusions and could be harmful to the Alberta electricity market. ATCO notes that the determination of net-CONE should be done based on forward looking assessments of the margins in the energy and ancillary services markets and the assessment should not be a backward-looking assessment. As such, clear assumptions on demand, and supply mix are required to be presented to market participants as part of the process.

Demand Curve Design: ATCO has concerns over the modelling and transparency of models presented in this working group. The demand curve modelling done by the Brattle Group was not fully shared, making it hard for working group members to evaluate the assumptions being made in the model without more information being known. For example, had more information been shown regarding Brattle's method of modelling supply shocks there would have been a more wholesome understanding of why the demand curves all appear right-shifted. The right-shifted nature of the demand curves being proposed have a high probability of over procurement of capacity. This not a tenable outcome for the capacity market. ATCO notes that the level of detail and explanation in the "Load Forecast Methodology" was helpful and encourages the AESO to continue this approach to transparency.

Further analysis is necessary regarding the demand curve. The AESO has chosen to employ the Brattle Group to model equilibrium. This is of concern to multiple stakeholders including ATCO, because it lacks transitional analysis. The Alberta capacity market will not be starting in an equilibrium position and may never reach equilibrium, or by the time it does the analysis done at the outset will be less relevant. ATCO suggests that a transitional analysis be conducted; an important consideration when choosing the appropriate demand curve is the market outcomes produced during the period of transition.

The working group did not reach consensus regarding the three demand curves presented by the Brattle Group. ATCO has concerns with underlying analysis and its appropriateness. It would be helpful and transparent if the AESO would be prepared to publish for review all the models that will lead to the choice of demand curve in the comprehensive market design.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Inter-operability Implications *How will the capacity market impact the energy and ancillary services markets?* Working Group (WG): ***Energy & Ancillary Services Market Changes***	**SAM 1.0 Starting Points** • Cost-based energy market offers. • Continue unit self-commitment. • Capacity providers must offer; all others may offer. • Raise price cap and introduce operating reserve demand curve (ORCD) to better reflect scarcity pricing. • Dispatch flexibility incented via energy or ancillary services markets rather than capacity market. • Roadmap for future market changes to address increased intermittency to include consideration of reliability unit commitment (RUC)/binding day-ahead market (BDAM)/shorter settlement interval and possible other ancillary services products. **SAM 2.0 Working Group Conclusions** All SAM 2.0 WG conclusions are based on Phase I analysis (i.e., assuming current system assets with introduction of capacity market). Can continue unit self-commitment. • The AESO should approve outages for capacity committed resources. • All supply capacity (committed and other) must offer physical availability (similar to rules today on offering maximum capability (MC) subject to an acceptable operating reason (AOR)). This includes loads that may be committed on the supply side of the capacity market. • If a cost-mitigated model is chosen, scarcity and shortage pricing mechanisms would be part of this model. Further work is required. • No changes to ancillary services products, markets, operations at this point.	**All SAM 2.0 WG conclusions (based on Phase I assumptions) were accepted as provisional recommendations by vote with the following exceptions:** • The AESO will not approve outages. The status quo (Rule 306.5) will continue for outage submissions and be used for information only. • Must offer to continue for all assets, though for non-capacity resources, this obligation is clarified as must "offer" visibility. **The additional SAM 3.0 provisional recommendations are based on Phase II assumptions related to net demand variability (NDV) changes and/or value for efficiency models.** **Unit Commitment & Dispatch** The self-commitment can continue to work. • The AESO will not approve outages. The status quo (Rule 306.5) will continue for outage submissions and be used for information only. **Offer Obligations** • All committed supply capacity must offer physical availability (similar to rules today on offering MC subject to an AOR). This includes loads that may be committed on the supply side of the capacity market. All non-committed supply capacity must "offer" visibility of resources.	**Phase I Votes:** • The outage approval conclusion changed as the Eligibility WG achieved directional alignment that outages do not create an exemption from a performance period. • Further investigation is required into rules or rule changes to implement visibility option for non-committed supply. **Phase II Votes:** **Unit Commitment & Dispatch** • The net-demand variability (NDV) studies indicate that there is increasing supply surplus and likely unit cycling in the future. The commitment modelling indicates that a future view of market pricing can support self-commitment; however, centralized commitment model would manage large asset cycling on/off. • The WG conclusion based on outage "approval" was based on the directional alignment from the Eligibility WG that outages did not form an exemption for a performance period. • The WG discussed options for how capacity committed imports could be scheduled and dispatched into the energy market and concluded that further details were required to compare the three options (status quo at zero dollars, priced offers within hourly market, or priced offers with dynamic scheduling). **Offer Obligations** • For non-committed supply capacity, the AESO will evaluate the use of offers into the merit order without startup time to provide visibility of available MW through the merit order. • Further discussion is required to explore how capacity commitment loads on the demand side of the capacity market would be addressed. **Pricing**

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
	Phase II (based on net-demand variability studies and further market efficiencies) to be tested by Q4 2017. These conclusions plus the Phase I conclusions will then be used for input into development of a future market roadmap. General alignment that NDV modelling will assist in understanding issues and timing of roadmap options.	**Pricing** • The WG accepted an overall pricing package including the following elements (further research will be completed for the consolidated proposal). – *Ex ante* process will be used to evaluate market power. Hourly residual supplier index (RSI) test/conduct and impact screens will be further evaluated. – Companies that fail the *ex ante* mitigation screen on an hourly basis will have their offers mitigated to a fuel-based limit as determined by some multiple of short-run marginal cost (soft cap). – Scarcity and shortage pricing mechanisms will be examined as part of bid mitigation model. No change to the price cap is proposed. Negative pricing requires further examination. **Ancillary Services** • WG agreed to the following ancillary services recommendations: – Based on the expected impacts due to increased variable generation and fleet changes, rule changes and price signals for flexibility address the issue. – While rule changes and price signals may address the need for system flexibility, the WG concluded that further consideration should be given to a ramp product design as part of the Roadmap process. – A must offer for ancillary services is not required. – The current ancillary services market (sequential model) will continue.	• Recognition that the majority of revenues expected to remain in the EAS markets; however, without a need for "full" recovery of fixed costs within the energy market, an *ex ante* approach provides control of risk of market power while still providing for scarcity pricing. • Further discussion about need/costs of impact test to be considered. • Further modelling in progress to evaluate options for a soft cap (to be determined based on multiples of short run marginal cost) to account for startup, no load, cycling and other costs within a single part bid model and to evaluate the overall impact on scarcity pricing and flexibility. The soft cap can be calculated and applied across fuel type, asset based or market-wide. • The WG agreed that scarcity, shortage pricing (as an adder to the price cap) and negative pricing requires further exploration as part of price fidelity <u>in a bid mitigation model,</u> The group had differing views as to which design change best achieved goals related to the price stability objective (including trade-offs between changing the price cap and introducing shortage pricing). **Ancillary Services (Net Demand Variability)** • Modelling has shown that the AESO will be able to effectively operate the system with increased NDV and current proactive dispatch protocols. However, future NDV will impact asset ramping and likely impact market price fidelity. The timing for these impacts based on the AESO's 2017 Long-term Outlook reference case is approximately 6-10 years out; however, as the fleet expands, this impact needs to be monitored especially in terms of the system ability to operate and how the fleet is impacted. • WG split on the recommendation on the need and timing for a ramp product as part of these market changes and concluded that further analysis was required on this. • The must offer for ancillary services will be considered should a co-optimized model be recommended.

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
		Efficiency Recommendations • A 15-minute settlement interval will be explored (aligned with current dispatch based on hourly offers) to provide incentives for flexible resources.	**Efficiency Recommendations** • Based on the information available and the expectation for increased variable generation, a financial binding time-ahead market will be considered in the context of other recommendations once completed and considered as part of the roadmap. The WG considered the qualitative assessment of a time-ahead market but did not vote on this element.

Name: Matthew Davis **Organization:** ATCO

Feedback: ATCO has appreciated being an active participant in the energy and AS working group and is looking forward to continued discussions on the evolution of the energy and AS markets in response to the introduction of a capacity market and evolving supply mix. ATCO submits the following comments on the provisional recommendations presented above:

Unit Commitment: ATCO believes that it is in Government's, stakeholder's, and consumer's best interest for efficient unit commitment decisions to be made. There is a cost with self-commitment as sub-optimal commitment decisions may be made by participants with less than full information of future market conditions. The AESO's modelling indicated that there were "limited" but still sizable (approximately $100 M/yr based off a visual estimate) production cost savings by moving to a time-ahead commitment approach. The same analysis has shown that unit commitment can lead to lower cycling of units which can lower fixed O&M costs, improving overall market outcomes (capacity & energy). ATCO notes that in none of the AESO's analysis was grid stability assessed and that it is not a decision criteria for self-commitment. With a sub-optimal commitment signal, the AESO may be required to commit assets to address this; and while the AESO does have existing unit commitment rules, they are not meant to be employed regularly. If relied upon regularly this may result in higher and more volatile costs to consumer. ATCO would note that should the AESO determine that self-commitment should continue, then there is a need to improve forward market information to make informed unit commitment decisions. Only the largest participants can see enough of the "market" to make rational, informed decisions.

Outage Approval: The directional alignment surrounding no exemptions from the performance framework for planned and forced outages reached in the eligibility working group has an impact on whether the provisional recommendation here should be revisited. Given that the performance framework is still under consideration, ATCO believes that if changes do occur, then further discussions on whether the AESO should approve outages would be warranted.

Must-Offer: ATCO is supportive of the general direction where resources that do not have a capacity contract have a lesser obligation in the energy market. Further considerations are required to assess what implications the proposed market power mitigation framework would have on this along with considerations for how resources without a capacity contract choose to either supply the energy and AS markets, or mothball until future conditions warrant their operations. The AESO's proposed solution would be for non-capacity resources to "remove" themselves from the market by not providing a start time, but still subject to providing P/Q pairs. In the working group discussions this was only briefly discussed as the provision of P/Q pairs was viewed as one of the issues.[5] ATCO would expect additional clarity and detail on this to be forthcoming in the consolidated market design.

Pricing – Market Power Mitigation: ATCO would like to note that in the working group session where this topic was voted upon, the recommendation was split into multiple votes, with responses conditional to the results. This is not clearly reflected in the discussion context presented. Given the significant amount of interdependences with other topics (e.g. performance framework, unit commitment) it is very difficult to approve of components of the market in a piecemeal fashion. ATCO believes that the decisions on market power, unit commitment, and scarcity/shortage/surplus pricing cannot be taken independently, and sees the combination of the current provisional recommendations as creating a risk of inefficient outcomes due to sub-optimal commitment and potential inability to fully recover costs. As such, ATCO anticipates better alignment and discussion as the consultation evolves in the consolidated market design.

Barring the concerns above, ATCO is generally supportive of clear ex-ante market power mitigation rules so long as they allow for efficient price discovery, particularly during times of scarcity, and recovery of costs through all levels of an asset's operation. For the Alberta market, ATCO notes that mitigation to some multiple of short run marginal costs is highly dependent on natural gas prices, and with low natural gas prices, even a reasonably high multiple may

[5] https://aeso.sharepoint.com/:w:/r/sites/cmd/EnergyAncillaryService/_layouts/15/WopiFrame.aspx?sourcedoc=%7B4DD16347-C73E-43F5-BA82-7AB6C7AC7CB0%7D&file=WIG%20Followup%20item%20WG7-2017-10-25.docx&action=default&IsList=1&ListId=%7BD9C22240-207E-49A0-AA22-6ED9DFDDF763%7D&ListItemId=224

be insufficient to create a scarcity price signal that would support flexible investments. Further clarity on how opportunity costs will be handled is also required to arrive at a final view of whether the details of the framework are acceptable.

Pricing – Scarcity / Shortage: ATCO is concerned that the AESO's comment that the price cap will remain unchanged does not reflect how working group members understood the discussion. The discussion was very much premised on the basis that shortage pricing would be an adder to market prices. ATCO believes that the AESO's intent in the discussion was to continue with the offer cap of $999.99/MWh, and allow prices, through an adder during times of scarcity to exceed the $1,000/MWh market cap currently in place, as there is very little benefits on having a single penny differentiating the price between balancing in the market and shedding firm load. ATCO has provided a document outlining that while the current offer cap may be sufficient, the price cap should be increased, and prices set closer to an approximation of the value of lost load when in shortfall conditions to reflect declining levels of reliability.[6]

Pricing – Surplus (Negative): ATCO was supportive of the decision to continue to "explore" negative pricing particularly as it was not discussed in detail at all through the net-demand-variability studies. In general, it is very difficult to not support further exploration of important market design topics and expect that these consultations with the AESO will continue as the market evolves.

Net Demand Variability (NDV): Within the working group discussion the AESO indicated that it could continue to manage NDV as is done today - system controllers dispatch up and down the merit order, sometimes dispatching additional generators for ramp. ATCO has observed that system controllers have been using the energy market merit order (EMMO) to dispatch for ramps, particularly when slower ramping resources are on the margin. These actions, particularly since they are applied inconsistently and the purview of the particular system controller on shift can distort the price signal. This issue will become more acute with additional intermittent resources on the system along with changes to the relative competitiveness of fuel types in response to increasing carbon costs. As such, ATCO suggests that if the AESO truly needs a ramping product(s) then requirements should be determined, and a new product procured. Otherwise, price signals will become more distorted due to ramping concerns.

Further, the AESO has indicated that dispatch tolerance rules may be changed to better manage NDV. On rule changes, the proposed dispatch tolerance changes must reflect the realities of power plant operations. ATCO has not seen sufficient evidence that the current dispatch tolerance rules are problematic. Overall, suppliers should be naturally incented to move quickly to dispatch levels (e.g. through shorter settlement intervals, payments to suppliers on the margin). Other generators should not pay a compliance price for wind / solar being on the system when there are other tools to manage variability.

Ancillary Services: ATCO is supportive of the provisional recommendation to retain the status quo of the operating reserves market.

Efficiency: ATCO does not see a move to a 15-minute settlement as high priority and would want to ensure that higher priority issues are dealt with first. In the discussion in the working group it was brought up that there is a need to better understand the implications on AS pricing, imports/exports, among others. ATCO would appreciate further discussion on this topic and other efficiency improvement topics.

Modelling: The AESO has presented significant amounts of modelling through this process. ATCO appreciates the effort involved in presented the information. The time was short to review the material presented but ATCO has provided feedback on the modelling but has not received confirmation or a response on the feedback. Specifically:

- With respect to the shortage pricing analysis for revenues across markets, ATCO would like to better understand the use of 50 hours of shortage (within an EEA event) pricing.[7] Even in 2013, one of the tightest years on record, and most likely much lower than the resource adequacy target, there were only 39 hours of EEA events.[8]
- ATCO and others in the working group have to assume that carbon pricing was not accurately reflected in the market power mitigation analysis that Brattle has been performing. The analysis is stated to be based on 2013 mark-ups and as such would only include the SGER level of carbon costs whereas on a go forward basis carbon is known to be much higher. ATCO is unaware of whether this has been addressed, and would appreciate further clarity on the question.
- Within much of the analysis being performed, the AESO is using its 2017 Long Term Outlook. ATCO views the profile of development for coal to gas conversions to be an important consideration in this analysis (just as wind development is). ATCO believes that the AESO's high coal to gas conversion, while achieving a reasonable assumption for conversions by 2030, fails to accurately reflect the economic incentive there is to convert early as evidenced by recent announcements.

[6] Please see material posted in Energy & AS Working Group Session 11 (Nov. 22nd)

[7] In response to material posted in Energy & AS Working Group Session 11 (Nov. 22nd)

[8] See AESO's presentation: Supply Cushion at different lead times preceding EEA1 events (Eligibility WG presented Oct. 10th)

SAM 1.0 Key Design Question	SAM 1.0 Starting Points & SAM 2.0 Conclusions* *The term 'conclusion' is used to ensure continuity from SAM 2.0	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
Roadmap: ATCO appreciates how the AESO is viewing the roadmap. ATCO would suggest: • Changes to the market power mitigation framework be included for the start of the capacity market. • Changes such as introduction of a ramping product and/or a move to centralized unit commitment occur based on a trigger related to the market change (such as when there is significant penetration of intermittent renewables, or when there is significant cycling on the system). • Lower priority changes such as a move to 15-minute settlement should be timed for a later date (post start of the market) when sufficient resources can be devoted to evaluating and effectively implementing that change.			

Please review and provide your feedback on the outlines for comprehensive design working group sessions			
Session One: General	**Session Two: Capacity Market Design**	**Session Three: Energy and Ancillary Services**	**Session Four: Technical**
• CMD review – General overview – Concentrate on areas impacting total revenue, operability or risk between markets • E.g., market mitigation, performance penalties • Confirm focus areas for Design, EAS and Technical working groups • Q&A	• CMD review – Entire document – Penalty mechanism – Mitigation – Term – Auction timelines and delivery cycle – Auction mechanics – Qualification requirements	• EAS modelling – Pricing • Mitigation proposal comparison • Shortage pricing – impact of different price levels given fixed number of shortage hours – AS: Evaluation of co-optimization – Unit commitment: Impact of different fleets (testing robustness of conclusion with high coal to gas portfolio) • CMD review – Entire document – EAS: Intertie offer and dispatch offers; Ramp product – Must offer visibility • Roadmap: Four categories	• Resource adequacy modelling – Review feedback on load forecast – Modeling inputs (outage information, intertie) – Modeling output • UCAP – Principle to calculation – Data needs/issues/process – Draft calculation methodology for conventional thermal resources, intertie • Net-CONE – Review scope of work: gross-CONE and net-CONE – Seek feedback on financing assumptions, EAS methodology

Name: Matthew Davis **Organization:** ATCO

Feedback: ATCO appreciates the opportunity to provide feedback in advance of the sessions being held and looks forward to participating in the upcoming consultations.

ATCO submits that the demand curve discussion should be moved from the Capacity Market Working Group to the Technical Working Group. There is an efficiency gain from having the same technical members that were in the Adequacy and Demand Curve Working Group continue to review and evaluate the demand curve in the Technical Working Group. Even if the high-level determinations are discussed in the Capacity Market Working Group, the bulk of the input assumptions and calculations are highly technical in nature and should be discussed in the Technical Working Group.

As noted earlier in the Resource Adequacy comments above, ATCO states there is a need for transparency in all the modelling that is employed by the AESO. Inevitably a considerable amount of modelling will have been done to reach the decisions in the comprehensive market design, the models used in this process should be released to stakeholders for review and edification. The new role for stakeholders as “reviewers” rather than “designers” will be aided immensely through transparency of modelling and clarity around decisions made in the comprehensive market design.

The new stakeholder engagement process requires a closer scrutiny of governance within the framework. To promote a collaborative input framework an inclusion of stakeholder oversight to the AESO would be beneficial. ATCO submits this could be done by creating a level of stakeholder agreement that once achieved on any topic within the comprehensive market design process would mandate that the AESO revisits a section of the CMD, even if that section was not initially on the agenda for consideration. Stakeholders need assurance that we are being heard in a meaningful way during the consultation process.

In the revised consultation process the place for written comments has been removed. ATCO considers that a written process for stakeholders alongside the in-person meetings would allow for the record to remain intact and reviewed throughout the market design. This would also provide better visibility for market participants that are outside the working group process. ATCO suggests it would be reasonable to have a written process engaged alongside and in coordination with the timing of the working group sessions.

In the interest of effective working group meetings, ATCO requests that materials be distributed before the meetings with reasonable time for stakeholders to review. As the interdependencies of market design become more complex, it is crucial that stakeholders have sufficient time to review the implications of these design elements. As a suggestion, two weeks prior to the meetings would be sufficient for parties to review material and prepare comment/discussion points during the meetings. One apparent problem with the previous consultation process was the plethora of documents produced and distributed shortly before working group meetings with the intent of discussing these documents at the meeting.