

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* <small>*The term 'conclusion' is used to ensure continuity from SAM 2.0</small>	SAM 3.0 WG Provisional Recommendations	SAM 3.0 WG Discussion Context
<p>Eligibility</p> <p><i>Who can provide capacity? How much can they provide?</i></p> <p>Working Group (WG):</p> <p>Eligibility & Capacity Value Determination</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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. <p>SAM 2.0 Working Group Conclusion</p> <ul style="list-style-type: none"> UCAP MW should be used to represent capacity when determining capacity values. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

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			<ul style="list-style-type: none"> • The WG was generally aligned with supporting the inclusion of all resource types noted above provided they all met common criteria: <ul style="list-style-type: none"> - 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? <ul style="list-style-type: none"> - 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.

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<p>Cost Allocation</p> <p><i>How will capacity costs be allocated?</i></p> <p>Working Groups (WG):</p> <p>Eligibility & Capacity Value Determination</p> <p>Procurement & Hedging</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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. <p>SAM 2.0 Working Group Conclusions</p> <p><i>n/a</i></p>	<p><i>No recommendation</i></p>	<ul style="list-style-type: none"> 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.

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<p>Performance Assessments</p> <p><i>How do we know that capacity has been provided?</i></p> <p>WG:</p> <p>Eligibility & Capacity Value Determination</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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). <p>SAM 2.0 Working Group Conclusions</p> <p><i>n/a</i></p>	<p><i>No recommendation</i></p>	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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).

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<p>Term</p> <p><i>How long will the capacity delivery period be?</i></p> <p>Working Group (WG):</p> <p>Market Mechanics</p>	<p><small>*The term 'conclusion' is used to ensure continuity from SAM 2.0</small></p> <p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> One year, non-seasonal commitment period for all assets. <p>SAM 2.0 Working Group Conclusions</p> <ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> The obligation period will be one year (non-seasonal). 	<ul style="list-style-type: none"> 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: Kelly Cantwell Organization: Emera inc

Feedback: As is noted in the WG discussion context, the results were very close. We see the obligation period or term as a foundational element to the development of the capacity market and we believe it requires further consideration by the AESO. In order to attract and encourage new investors to build large, capital intensive generation in Alberta a commitment term of more than one year will be necessary. We encourage the AESO to reconsider based on the following:

Lower cost option: Developing large-scale, capital intensive generation projects is a challenge in any market, especially when environmental constraints are changing. It's generally true that lower risk investments require lower rates of return. If there is limited revenue certainty, the costs to finance a project rise and those costs are passed on to consumers of the product or the project is not built. We believe that the more revenue certainty that can be provided for large-scale generation projects, the lower the cost of capacity. Limiting new generators to a one year term greatly reduces revenue certainty and therefore, we believe, will increase the cost of capacity to customers in years to come.

Barrier to entry: Limiting new asset obligation terms to one year is a significant barrier to entry. In the current energy only market, a generator can enter into bilateral contracts with load participants for capacity for an agreed term. Under the new capacity market, we understand that will not be possible as all capacity will be procured by the AESO. In this way, conditions for investment will deteriorate with the introduction of a capacity market under the proposed recommendation. We see this as increasing the barriers to entry for new, large scale investment.

One size doesn't fit all: In SAM 1.0, the AESO noted that there were trade-offs to be considered in setting the term of the capacity contract. The discussion of tradeoffs in SAM 1.0 makes it clear that one size does not fit all. Some suppliers may benefit from shorter contract length while others may find shorter contract length prohibitively increases their cost to compete. It was noted that while longer term contracts may reduce financing costs, they may also increase the risk of over procurement due to forecasting error. Finally it was noted that some jurisdictions have the option for suppliers to lock in their received price for a number of years while taking on delivery risk.

The market mechanics working group explored a 1 or 7 year term. We propose that AESO, in consideration of the fact that one-size does not fit all, consider including an option for new entrants to bid a one year and/or a multi-year capacity price. In this way, the AESO can make a determination of the best solution at the time and preserve for customers the ability to secure the lowest, long-term cost of capacity.

SAM 1.0 Key Design Question

SAM 1.0 Starting Points &
SAM 2.0 Conclusions*

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SAM 3.0 WG Provisional Recommendations

SAM 3.0 WG Discussion Context

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<p>Obligation to Procure</p> <p><i>Who will buy the capacity?</i></p> <p>Working Group (WG):</p> <p>Procurement & Hedging</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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. <p>SAM 2.0 Working Group Conclusions</p> <ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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)). Sites with onsite generation that cannot physically flow their gross volumes due to system connection limitations must self-supply. Sites with onsite generation and no connection flow limitation can choose to self-supply with the following conditions: <ul style="list-style-type: none"> 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). 	<ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> WG definition of physical bilateral procurement is as follows: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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.

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	<p>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.</p> <p>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.</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> - 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.
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<p>Capacity Market Settlement <i>How will capacity providers be paid?</i></p> <p>Working Group (WG): Procurement & Hedging</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> • 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. <p>SAM 2.0 Working Group Conclusions n/a</p>	<ul style="list-style-type: none"> • The capacity market should facilitate capacity market net settlement instructions within the design of the market. 	<ul style="list-style-type: none"> • Some items within the topic of settlement (e.g., settlement, billing, credit) were not scheduled for the SAM 3.0 development cycle. 	

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<p>Market Mechanics</p> <p><i>How will the capacity market work?</i></p> <p><i>When and how often will capacity be purchased?</i></p> <p>Working Group (WG):</p> <p>Market Mechanics</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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.* <p><i>* This starting point was included with the Eligibility key design question in SAM 1.0</i></p> <p>SAM 2.0 Working Group Conclusions</p> <ul style="list-style-type: none"> Centralized capacity market. Existing and new resources will participate in a single auction. Separate auctions will not be held for new or existing resources. 	<p>Recommendations</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. <p>Directional Alignment</p> <ul style="list-style-type: none"> 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 <i>ex ante</i> 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 compensation 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.

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- 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 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.

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<p>Resource Adequacy Requirement</p> <p><i>How much capacity needs to be procured?</i></p> <p>Working Group (WG):</p> <p>Adequacy & Demand Curve Determination</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> 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 $(\text{target} - \text{minimum}) < (\text{maximum} - \text{target})$. <p>SAM 2.0 Working Group Conclusions</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<p>Annual vs. Seasonal Requirements</p> <ul style="list-style-type: none"> 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. <p>Reliability Requirement</p> <ul style="list-style-type: none"> 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. <p>Governance</p> <ul style="list-style-type: none"> 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.

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	<ul style="list-style-type: none"> • Demand curve will be downward sloping. • Demand curve should have the appropriate governance and oversight (how is to be determined). 	<ul style="list-style-type: none"> • 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. 	<p>Demand Curve Design</p> <ul style="list-style-type: none"> • 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. <p>Net-CONE</p> <ul style="list-style-type: none"> • 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.

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			<ul style="list-style-type: none"> 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.

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<p>Inter-operability Implications</p> <p><i>How will the capacity market impact the energy and ancillary services markets?</i></p> <p>Working Group (WG):</p> <p>Energy & Ancillary Services Market Changes</p>	<p>SAM 1.0 Starting Points</p> <ul style="list-style-type: none"> • 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. <p>SAM 2.0 Working Group Conclusions</p> <p>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.</p> <ul style="list-style-type: none"> • 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. 	<p>All SAM 2.0 WG conclusions (based on Phase I assumptions) were accepted as provisional recommendations by vote with the following exceptions:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Unit Commitment & Dispatch</p> <p>The self-commitment can continue to work.</p> <ul style="list-style-type: none"> • The AESO will not approve outages. The status quo (Rule 306.5) will continue for outage submissions and be used for information only. <p>Offer Obligations</p> <ul style="list-style-type: none"> • 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. 	<p>Phase I Votes:</p> <ul style="list-style-type: none"> • 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. <p>Phase II Votes:</p> <p>Unit Commitment & Dispatch</p> <ul style="list-style-type: none"> • 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). <p>Offer Obligations</p> <ul style="list-style-type: none"> • 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.

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	<p>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.</p>	<p>Pricing</p> <ul style="list-style-type: none"> The WG accepted an overall pricing package including the following elements (further research will be completed for the consolidated proposal). <ul style="list-style-type: none"> <i>Ex ante</i> 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 <i>ex ante</i> 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. <p>Ancillary Services</p> <ul style="list-style-type: none"> WG agreed to the following ancillary services recommendations: <ul style="list-style-type: none"> 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. 	<p>Pricing</p> <ul style="list-style-type: none"> 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 <i>ex ante</i> 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). <p>Ancillary Services (Net Demand Variability)</p> <ul style="list-style-type: none"> 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.

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		Efficiency Recommendations <ul style="list-style-type: none"> A 15-minute settlement interval will be explored (aligned with current dispatch based on hourly offers) to provide incentives for flexible resources. 	Efficiency Recommendations <ul style="list-style-type: none"> 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.

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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
<ul style="list-style-type: none"> • CMD review <ul style="list-style-type: none"> – General overview – Concentrate on areas impacting total revenue, operability or risk between markets <ul style="list-style-type: none"> • E.g., market mitigation, performance penalties • Confirm focus areas for Design, EAS and Technical working groups • Q&A 	<ul style="list-style-type: none"> • CMD review <ul style="list-style-type: none"> – Entire document – Penalty mechanism – Mitigation – Term – Auction timelines and delivery cycle – Auction mechanics – Qualification requirements 	<ul style="list-style-type: none"> • EAS modelling <ul style="list-style-type: none"> – Pricing <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> – Entire document – EAS: Intertie offer and dispatch offers; Ramp product – Must offer visibility • Roadmap: Four categories 	<ul style="list-style-type: none"> • Resource adequacy modelling <ul style="list-style-type: none"> – Review feedback on load forecast – Modeling inputs (outage information, inertia) – Modeling output • UCAP <ul style="list-style-type: none"> – Principle to calculation – Data needs/issues/process – Draft calculation methodology for conventional thermal resources, inertia • Net-CONE <ul style="list-style-type: none"> – Review scope of work: gross-CONE and net-CONE – Seek feedback on financing assumptions, EAS methodology

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