

AESO Discussion Paper – Short-Term Wind Integration Stakeholder Comment Matrix

Section	Subsection	Stakeholder Response
<p>4.0 Policy Coherence</p>	<p><u>Wind Integration Principles</u></p> <ol style="list-style-type: none"> 1. Any potential suite of wind integration tools must ensure the safe and reliable operation of the system. 2. Market solutions are preferable to administrative solutions. 3. The energy market merit order is primarily a tool for balancing energy requirements on the system. 4. All generation should be treated fairly while recognizing their unique characteristics. 5. Ancillary services are a tool to protect the system from events that cannot be reasonably controlled. <p>The draft principles are intended to outline a preliminary view on the interpretation of FEOC as it relates to the interaction between wind generation, the energy market and ancillary services. This relationship must be explored in order to develop a long-term wind integration plan that is grounded in policy and consistent with the current market design.</p>	<p>TransAlta would like to have “reasonably controlled” as used in Principle 5 defined in the context of wind integration. What is reasonably controlled in terms of magnitude and time for a system event before ancillary services may be used? If this is to be used as a principle it should be defined beyond just Wind as Ancillary Services are used for managing the supply demand balance, not simply the variances associated with Wind. At a minimum we would suggest “reasonably controlled” be changed to “reasonably forecast”.</p> <p>Principle 4 defines how wind is treated in comparison to other generators. Can the AESO clarify how this relates to Principle F in the Supply Surplus rules: “level playing field for all competitors”: Rules should consider, and to the extent possible accommodate, the different characteristics of each generation type, without unduly favoring one type of generation over another. TransAlta would suggest that this principle add in “unduly penalizing” to the definition rather than just “favoring”.</p> <p>TransAlta believes that there are inconsistencies between the principles for Supply Surplus and Short Term Wind Integration and that they need to be aligned and potentially made the same rather than creating different inconsistent principles for each separate initiative.</p>

<p>6.0 Short-Term Integration Tools</p>	<p>6.1 Energy Market Merit Order</p> <p>Stakeholder feedback on using the EMMO to integrate wind generation is requested with the following key points:</p> <ul style="list-style-type: none"> • At what point is over-dispatching the merit order for ramp rate unacceptable from a FEOC perspective? • If the need to over-dispatch EMMO can be anticipated prior to real-time, should tools such as incremental ancillary services and/or WPM be used in place of over dispatching EMMO? • In the long-term, should new ancillary services be developed that will reduce the instances of over dispatching EMMO for ramp rate both for wind and for other reasons? 	<p>Over ramping the energy market merit order is a “Free” ancillary service to the Alberta System. Given supply and load has to balance then over dispatch must mean that partial blocks are being dispatched. It would also seem probable that the higher priced blocks come from gas-fired and Hydro generation, the blocks with higher ramp rate capabilities. The ramp rate of these facilities is really what the AESO is after when they are over dispatching the EMMO. Thus we believe there are better ways to achieve this end.</p> <p>We accept that occasionally the AESO may be in a situation where they may need to employ over dispatch to insure system reliability. Tools such as incremental ancillary services should be used before EMMO over dispatch if the need can be anticipated. However these ancillary services should not be dispatched in advance of a potential problem but when it is actually occurring. This would allow for better price signals in the market. Incremental ancillary service should be used before Wind Curtailments.</p> <p>The information in this section on use of the EMMO is limited and should be expanded so that participants can understand the extent of the current and forecast problem. Specifically can the AESO provide information on the extent to which the EMMO has been over dispatched to manage Wind Ramps in the past few years. Further can they provide the extent of the impact on the pool price and duration of each event.</p> <p>TransAlta would like to know how often EMMO over dispatch would be used? How many MW’s? For what duration in time? Price impact?</p> <p>In the long term the AESO should look at procuring new types of</p>
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		<p>Ancillary services to manage fast changes in demand or supply. We believe the AESO needs to consider sending out a price signal for a units ramping capability. This may be as simply as creating two levels of ancillary services where participation is determined by a minimum ramp rate capability. Does the AESO currently use ancillary services in a manner that recognizes the different speeds units are able to ramp or are they using an average ramp rate across all they have procured? If it is an average, it is not an efficient tool to manage fast ramps or declines. Whether these are cause by load or generation or Wind specifically is irrelevant. Thus we believe the AESO should consider procuring two levels of reserves. The first could be called a “base” reserve service which would require a lower ramp rate service. Then the AESO could procure a faster ramp service for events that require this. These events are caused by the volatility of both load and generation, not just Wind. Procurement of this faster ramp service would put the AESO in a better position to manage these fast ramps and declines in a more efficient and least cost manner.</p> <p>New ancillary services should be developed in order to better meet the ramping needs of wind and load. TransAlta believes that the development of new Ancillary Services needs to go through a consultation process to ensure that it complies with FEOC, there will be at least three providers of the service in order for the market to be competitive.</p>
	<p>6.2 Operating Reserve</p> <p><u>Regulating Reserve</u></p> <ul style="list-style-type: none"> • Is it appropriate and FEOC to procure RR day-ahead when the wind forecast suggests they will be required to mitigate wind volatility? 	<p>TransAlta believes that operating reserves are an important tool for balancing the market. Regulating Reserves should be procured Day Ahead when required to mitigate wind volatility.</p> <p>It is important to be able to integrate wind without sending false price signals, thus we should not rely on over dispatching the EMMO in situations when wind ramps can be anticipated. The</p>

	<ul style="list-style-type: none"> • How should the volume, if any, of incremental active regulating reserve be determined? <ul style="list-style-type: none"> ○ Based on the volume required to accommodate forecast wind energy? ○ Based on a tradeoff between the cost of incremental reserve and the value of lost wind production? ○ Based on the volume required to reliably integrate wind without planning to rely on tools such as over dispatching the EMMO? • Should standby RR be activated in near-real time to manage the system over and above current RR levels? <ul style="list-style-type: none"> ○ Activating standby reserve would need to be done prior to an actual problem because moving reserve from standby to active make a situation worse as the unit activated alters its generation to provide the service. ○ Is it appropriate and FEOC to activate standby RR near real-time (T-2 or even T-30min) when the near real time wind forecast and system conditions suggest they will be required to mitigate wind volatility? • In the long-term, should regulating reserve be split into a load following product and an AGC product? 	<p>volume of RR procured should reflect this.</p> <p>Standby RR should be activated in T-30 or as short a timeframe as possible to manage the system since it is important for system stability. Standby should be activated over the shortest timeframe required and the units chosen for activation should not already be dispatched in the energy market for it to be effective. Specifically reserves should not be activated in advance of a potential change in Wind or Load but rather be used to manage this situation once it occurs.</p> <p>In the long term RR should be split into a fast ramp and base ramp product. The fast ramp product could be used to manage both volatility in load, volatility in Wind production or volatility in any other type of generation production. This would allow for a more transparent market. A consultation process is needed to determine that a competitive market is achievable with at least three providers and that the services are procured in a fair and competitive manner. This would ensure that the products that are procured are only used for situations for which they were intended. Base ramp products would only be used to balance normal fluctuations in the system and the fast ramp products for other system ramp issues. This would result in the most efficient products managing the ramping issues at the least cost.</p> <p>TransAlta would like more information on how the AESO arrived at incremental costs in table 3. Specifically are these the estimated incremental cost of procuring an additional 30 MW's or was this based on an average procurement price. We'd like to better understand the key assumptions used to develop these numbers.</p>
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	<p>6.2 Operating Reserve</p> <p><u>Contingency Reserve</u></p> <ul style="list-style-type: none"> • Should the AESO use mandatory active contingency reserve to manage unexpected decreases in wind generation if allowed by NWPP? • Should the AESO carry incremental active contingency reserve to insure against decreases in wind generation? <ul style="list-style-type: none"> ○ This reserve could be tailored for specific hours when wind is forecast to ramp down and load forecast to ramp up, for example. ○ The alternative is likely to fully dispatch EMMO for ramp rate requirements when wind energy unexpectedly declines. ○ This is consistent with the use of contingency reserve to replace lost generation from other resources. • Should standby contingency reserve be activated in near-real time to manage the system, i.e. the system would carry more than the minimum active contingency reserve in some hours to manage wind variability? <ul style="list-style-type: none"> ○ Reserve would need to be activated prior to an actual problem. ○ The accuracy of the wind forecast inside T - 2 or even T - 30 minutes 	<p>TransAlta would like the definition of “mandatory active contingency reserve.” What does “mandatory” mean in this case? Would generator be forced to provide contingency reserves when they do not want to participate in the AS market?</p> <p>The AESO should carry incremental active reserves to mitigate decreases in wind generation or volatility in load. Over-dispatching the EMMO would cause price volatility that would not accurately reflect the energy needs of the market since it would only reflect the ramp rate needed. Contingency reserves would better reflect the ramping needs of wind and load without adversely affecting the pool price. Using contingency reserves is also consistent with current market practices since the purpose of contingency reserves is to replace energy from generation loss.</p> <p>Standby contingency reserve should be activated in near-real time if deemed necessary by the system operator to manage reliability of the system. This is consistent with current practices. We do not believe contingency reserves should be activated in anticipation of a drop in wind production. Activating them when the change occurs is consistent with how other generation contingencies are managed.</p> <p>The system should carry enough contingency reserves to deal with unexpected decreases in wind generation. Wind generation output decreases should be treated as with any other generator in the system and thus the AESO needs to accommodate for any sudden decrease in generation by procuring enough reserves. If Stand by contingency reserves were used, they must be used as close to real time as possible to manage the event. We are concerned that Standby Contingency reserves could be activated before required and would like to further discuss criteria applicable to determine when it should be used. We would like it to be activated as close to the real time problem as possible.</p>
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	<p>will determine the likelihood of activating standby reserve only when required.</p> <ul style="list-style-type: none"> • Should unexpected decreases in wind generation be treated equivalently to other generation contingencies, i.e. the system carries sufficient contingency reserve to manage unexpected loss of generation? 	
	<p>6.3 Wind Power Management</p> <ul style="list-style-type: none"> • Under what conditions is it appropriate to use WPM? <ul style="list-style-type: none"> ○ In advance of conditions that might place the system at risk? <p>For example, if wind is at a high level and expected to ramp down concurrently with the morning load ramp up, should WPM be used proactively or should a solution such as activating standby contingency reserve be used?</p> ○ When the wind ramp is not forecast? <p>This implies the AESO purchase sufficient ancillary services to accommodate forecast ramps.</p> ○ When the wind ramps up more rapidly than the EMMO can accommodate without over dispatching? <p>This allows wind production to increase only as fast as the EMMO can ramp down and implies that incremental ancillary services will not be purchased to accommodate</p> 	<p>TransAlta believes that WPM should not be used prior to activating standby contingency reserve. To be clear there are two things that the AESO can use in relation to wind generating units:</p> <ol style="list-style-type: none"> 1) Wind ramp rate control 2) Wind Curtailments <p>We would suggest that ramp rate control on new units that have this capability be used before Wind curtailments are applied. Units that do not currently have this capability should not be required to put it in place as part of short term wind integration.</p> <p>Curtailment of wind in anticipation of a forecast down ramp suggests that although the down ramp is forecast that the AESO can not put into place sufficient suitable generation to ramp up to cover the decrease in wind and the increase in load. The key to this is the ability to forecast such down ramp rates and to having had such ramp rates occur. The AESO given the forecast must procure the necessary ancillary services and only if they are not available should Wind curtailment be used.</p> <p>The AESO should purchase sufficient contingency reserves in order to accommodate the forecast loss of generation and maintain system stability. If the down ramp is not forecast then the AESO must use available reserves.</p> <p>Wind curtailment or wind ramp rate control should not be used</p>

	<p>potential wind ramp up events.</p> <ul style="list-style-type: none"> ○ Under supply surplus conditions? <ul style="list-style-type: none"> ● Should the AESO establish a WPM market solution or is pro-rata appropriate? <ul style="list-style-type: none"> ○ How would a WPM market interact with the solution for supply surplus and/or congestion management? ○ Would participation be limited to wind facilities and how would costs be allocated? ● In the long-term, should the AESO develop an ancillary service that accommodates wind ramps up by reducing production from in merit generators and/or wind facilities themselves? <ul style="list-style-type: none"> ○ Is this an appropriate cost for load to bear since wind can manage this operational challenge through a WPM protocol? 	<p>under supply surplus conditions since all types of generation need to be treated equally. All generators still on would be offered at \$0 which is also where wind is currently offered. Thus wind generations will need to be curtailed along with other generators. This would be consistent with a FEOC market where no preference is given to fuel type.</p> <p>In the long run the AESO needs to procure additional services to accommodate the ramps and declines created by load and supply. These services may be used not only for Wind Power, so do not have to be deemed a Wind following service, but rather are additional balancing services.</p>
	<p>6.4 Wind Power Forecast</p> <ul style="list-style-type: none"> ● Should the system be able to accommodate forecast wind generation? <ul style="list-style-type: none"> ○ Purchase sufficient reserve to accommodate forecast wind generation. ○ The alternative is to rely on more WPM and /or over dispatching EMMO. ● Should the wind power forecast for individual facilities (or the aggregate wind forecast) 	<p>Wind power forecast will be essential for any or a combination of the proposals as it will allow for AESO response in a timely manner. It is important that the AESO develop an accurate wind power forecast, once this is in place then the system should accommodate forecast wind generation. The AESO should procure sufficient reserves as forecasted instead of relying on WPM or over dispatching EMMO.</p> <p>The wind power forecast was the wind industry substitution for the “must offer must comply” obligation. The forecasts will ensure that the system operator will have a more accurate picture of the system at all times.</p>

	<p>resemble a must offer must comply obligation in the long-term?</p> <ul style="list-style-type: none"> ○ If the forecast creates obligations for wind facilities, does it also create obligations for the system to absorb the forecast without using WPM? 	<p>The use of the power management aspects of Wind Power Management in this rule is only placed on Wind, i.e. curtailment. Thus it should be used only as a last resort and be considered similar to a directive for other types of generation. The circumstance would occur when the wind production, given all other system considerations, exceeds what can be accommodated and wind must be curtailed. For example, load is relatively low and ramping down whereas wind at the time is ramping up. Other system requirements preclude curtailing other forms of generation and wind then must be curtailed.</p>
	<p>6.5 Summary of Integration Options</p> <p><u>Short-Term Requirements</u></p> <ul style="list-style-type: none"> • Determine the volume, mix and procurement strategy for incremental ancillary services as wind capacity increases • Develop a process to implement WPM • Develop guidelines on the use of WPM in real time or near real time 	<p>TransAlta would like the AESO to develop a process to integrate wind by first utilizing operating reserves, then EMMO (once all the reserves are dispatched), then using WPM as a last resort. When WPM is used, wind ramp rate control should be applied before wind curtailment is applied.</p> <p>WPM should not be used until all other solutions have been utilized. That means operating reserves have been exhausted and EMMO has been dispatched.</p>
	<p>6.5 Summary of Integration Options</p> <p><u>Potential Long-Term Direction</u></p> <ol style="list-style-type: none"> 1. Mitigate wind power primarily through the use of centrally procured ancillary services <ul style="list-style-type: none"> ○ Minimal use of WPM ○ No must offer must comply obligation for wind ○ A ramping service would be developed 	<p>Wind generation’s solution to the “must offer must comply” obligation was to produce the wind power forecast. This gives an accurate forecast of wind production T-2 and thus is the equivalent of MOMC. MOMC would place unfair cost on wind generators since they would have to restate every time wind output changes and would change it to reflect current production. Lack of wind would be an AOR. The T-2 production estimate is accomplished with the wind forecast and thus restatement would offer no added benefit to the market through a MOMC obligation</p> <p>WPM should only be used as a last resort since this unfairly penalizes wind. The cost associated with WPM could be very</p>

	<p>2. Mixed solution</p> <ul style="list-style-type: none"> ○ WPM used to mitigate wind ramp up events ○ Reserve to mitigate wind ramp down events ○ A ramping service may be developed ○ Could entail a form of must offer must comply obligation for wind generators particularly to control ramp ups <p>3. Create similar obligations for wind generators as exist for other generators</p> <ul style="list-style-type: none"> ○ Wind power forecast could be part of a must offer must comply obligation ○ Could require wind to be firm at T – 2 ○ Wind firming service developed either by the market or by AESO 	<p>large and thus would be unfair for wind to bear the brunt of it.</p> <p>AS will need to be developed and procured to address the issue with ramping and volatility of wind.</p>
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