# Stakeholder Comments and AESO Replies Matrix

## Proposed New Section 207.2 of the ISO Rules, *Calculation of Net-CONE*

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| **Date of Request for Comment:** | October 26, 2018 | | |
| **Period of Comment:** | October 26, 2018 | through | November 14, 2018 |

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| **Establish Gross-CONE, Energy Offset and Net-CONE**<br>**Subsection 2** | |
| Capital Power Corporation ("Capital Power")<br><br>Even though this is already the case, it should be included to set a precedent for the development of future CONE values.<br><br>*New subsection 2(2): The AESO will establish the initial gross-CONE value based on a study performed by an independent third-party consultant with cost of new generation expertise.* | The AESO does not agree with the change proposed by Capital Power. While it is expected that the AESO will contract with one or more independent consultants to produce gross-CONE studies on a go forward basis, including Capital Power's proposed subsection in the rule would bind the AESO to a specific approach when it may not be appropriate for future auctions. |
| Capital Power Corporation ("Capital Power")<br><br>The AESO must define what gross-CONE and Net-CONE values are intended to represent to, among other things, provide guidance. The proposed definition comes from the Brattle CONE report<br><br>*New definition: cost of New Entry ("CONE") or gross-CONE" is meant to represent the total annual net revenue (net of variable operating costs) that a new generating resource would need to earn in Alberta wholesale electricity market to recover return on and of capital and fixed costs, given reasonable expectations about future cost recovery over its economic life.* | The AESO uses defined terms to provide a consistent meaning to terms that are industry specific or not commonly understood across the AESO's Authoritative Documents. The AESO is of the view that "CONE" or "gross-CONE" does not require a definition because it is a specific numerical value that is either: (i) the value in subsection 3 for the 2021/2022 obligation period; or (ii) the value in subsection 3 indexed using the formula in subsection 4 for subsequent obligation periods until the demand curve rules are revisited. |

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| **Initial Gross-CONE Value for 2021/2022 Obligation Period**<br>**Subsection 3** | |
| TransAlta Corporation ("TransAlta")<br>Section 207.2 broadly, and this subsection specifically, should be amended to remove hardcoded values from the rule language itself and instead include defined terms in the Consolidated Authoritative Document Glossary to eliminate the need to amend permanent ISO rules.<br>Section 207.2 should be redrafted so that it can remain as a permanent ISO Rule, and this subsection 3 should be redrafted to reference a new term, Initial Gross-CONE Value, as indicated in our recommended changes to the rule language in yellow highlighted text. In turn, the Initial Gross-CONE Value should be added to the Consolidated Authoritative Document Glossary with a value of $244.2/kW-year for 2021/2022 obligation period. These changes will decrease the AESO's administrative burden by allowing Gross CONE values to change without a rule amendment.<br>3 The **ISO** must establish an ~~initial gross-CONE value for the 2021/2022 obligation period of $244.2/kW-year~~ **Initial Gross CONE Value.** | The AESO does not agree with the change proposed by TransAlta. Please see the AESO's reply to TransAlta's comment on subsection 9(2) in the AESO's Replies to Proposed Section 206.1, *Qualification of Capacity* matrix. |
| **Calculation of Gross-CONE**<br>**Subsection 4(1)** | |
| TransAlta Corporation (TransAlta")<br>Please see our comments to subsection 3 above, related to creating the term Initial Gross-CONE Value.<br>**4(1)** The **ISO** must calculate the gross-CONE value for each **obligation period** ~~following the 2021/2022 obligation period~~ **Initial Gross CONE Value** in accordance with the following formula:<br>$gross\text{-}CONE_t = \textbf{Intial Gross CONE Value}\sim\sim gross\text{-}CONE_{t=2021/2022}\sim\sim \times composite\ index_t$<br>where:<br>(a) *t* equals the **obligation period** for which the gross-CONE is being determined;<br>~~(b) *gross-CONE* $_{t=2021/2022}$ is the initial gross-CONE value in subsection 3 above~~; and | The AESO does not agree with the change proposed by TransAlta. Please see the AESO's reply to TransAlta's comment on subsection 9(2) in the AESO's Replies to Proposed Section 206.1, *Qualification of Capacity* matrix. |

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| (~~b~~c) *composite index* $_t$ is the composite index value for **obligation period** *t* calculated in accordance with subsection 4(2) below. | |
| **Subsection 4(2)** | |
| Capital Power Corporation ("Capital Power")<br><br>In the calculation of gross-CONE, Brattle correctly recognizes that developers will hedge the exchange rate for purposes of purchasing turbines and further assumes that developers will make payments over a period of one year. Recognizing that developers will purchase the turbines in the future and that they will hedge these costs to the extent possible, it does not make sense for the composite index to update the exchange rate assumption with historical exchange rates but instead and to maintain consistency with the initial CONE estimate, the composite index should use the Forward exchange rate.<br><br>*4(2)(f) exchange rate t is the most recent Forward exchange rate for the period when turbine costs are expected to be incurred.~~12 month average of published Statistics Canada Monthly Average Exchange Rates in Canadian Dollars, U.S. Dollar monthly average, Table 33-10-0163-01~~.* | The AESO does not agree with the change proposed by Capital Power. The AESO is of the view that the methodology for updating CONE should be simple, transparent and easily replicable by market participants trying to determine net-CONE estimates. For these reasons, the composite index in subsection 4(2) is based on historical data, including the exchange rate. The inputs into the formula are taken from data sources that are freely available online and produced by reliable sources such as Statistics Canada and the US Bureau of Labour of Statistics.<br><br>The use of forward-looking data in the composite index formula is more complex and is dependent on different data sources, some of which are only available at a cost and therefore limiting accessibility and transparency to market participants. |
| TransAlta Corporation ("TransAlta")<br><br>The gross-CONE formula should be dynamic and remove hardcoded values, allowing for updates through the Consolidated Authoritative Document Glossary.<br><br>As stated in our comments to subsection 3 above, Section 207.2 should be drafted to be a permanent rule. Variables that require periodic review and update should be handled through changes to the Consolidated Authoritative Document Glossary.<br><br>**4(2)** The **ISO** must, in calculating the gross-CONE $_t$ value under subsection 4(1), calculate the composite index $_t$ using the following formula:<br><br>$$composite\ index_t =$$ | The AESO does not agree with the changes proposed by TransAlta. Please see the AESO's reply to TransAlta's comment on subsection 9(2) in the AESO's Replies to Proposed Section 206.1, *Qualification of Capacity* matrix. |

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| $\frac{0.25\ labour\ index\ weighting \times labour\ index_t}{60.7 labour\ index\ factor} + \frac{0.35 \text{material index weighting} \times\ materials\ index_t}{118.5\ material\ index\ factor} + \frac{0.40\ turbine\ index\ weighting \times tubrine\ index_t \times exchange\ rate_t}{268.7\ turbine\ index\ factor}$<br><br>where:<br>(a) *t* equals the **obligation period** for which the gross-CONE value is being determined;<br>(b) *composite index* $_t$ is the composite index value for **obligation period** *t*;<br>(c) ***labour index weighting*** is a term defined in the Consolidated Authoritative Document Glossary;<br>(~~c~~d) *labour index* $_t$ is the most recent 12 **month** average of published Statistics Canada Construction Union Wage Rates (Electrician), Monthly for Edmonton Alberta, Table 18-10-0046-01;<br>(e) ***labour index factor*** is a term defined in the Consolidated Authoritative Document Glossary;<br>(f) ***material index weighting*** is a term defined in the Consolidated Authoritative Document Glossary;<br>(g~~d~~) *materials index* $_t$ is the most recent 4 quarters average published Statistics Canada Gross National and Gross Domestic Income, Indexes and Related Statistics, Annual, Table 36-10-0105-01;<br>(h) ***material index factor*** is a term defined in the Consolidated Authoritative Document Glossary;<br>(i) ***turbine index weighting*** is a term defined in the Consolidated Authoritative Document Glossary;<br>(j~~e~~) *turbine index* $_t$ is the most recent 12 **month** average of published Federal Reserve Economic Data (St. Louis) Producer Price Index by Industry: Turbine and Turbine Generator Set Units Manufacturing (PCU333611333611); ~~and~~<br>(k) ***turbine index factor*** is a term defined in the Consolidated Authoritative Document Glossary; and<br>(l~~f~~) *exchange rate* $_t$ is the most recent 12 **month** average of published Statistics Canada Monthly Average Exchange Rates in Canadian Dollars, U.S. Dollar monthly average, Table 33-10-0163-01. | |
| **Calculation of Energy Offset**<br>**Subsection 5(1)** | |
| Alberta Federation of Electrification Associations (“AFREA”)<br><br>5(1)(e) maximum capability is equal to 93 MW.<br><br>All the values used in this section to define gross and net-CONE are ICAP values not UCAP values. See https://www.aeso.ca/assets/Uploads/CONE-Study-2018-09-04.pdf Section 5(1)(e) defines the maximum capability | AFREA is correct that gross-CONE and net-CONE are first calculated on an installed capacity basis. The AESO adjusts net-CONE to a uniform capacity value through the formula in subsection 4 of Proposed Section 207.3. |

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| as 93MW. This value was taken from Table ES-1 of the report referred to in the line above. The footnote for that table clearly defines this value as Installed Capacity (ICAP).<br><br>Offers for capacity will be defined in $/kW UCAP and should be compared to a capacity cap defined in $/kW UCAP, not $/kW ICAP. The gross-CONE value should be defined based on UCAP values. Section 4.4.1 of the Comprehensive Market Design Final proposal clearly states that prices will be expressed in dollars per kW (UCAP). Nowhere does the AESO define the UCAP for the Gross-CONE values.<br><br>Further, the AESO did not justify why it did not choose the cheapest form of generation to be used in the Gross-CONE values. In the report listed above, the AESO chose values for the Aero derivative GT for use in this section of the rules. We can find no justification for why the values for the Frame CT were not used. The Gross CONE values for that plant are less than half of those for the Aero derivative GT.<br><br>Section 4.3.1 of the Comprehensive Market Design Final proposal states "Additional details on the reference technology will be developed by the AESO and subject to further consultation." How was that consultation completed? When and where did the AESO disclose its justification for the reference technology used?<br><br>When and where did the AESO define the UCAP value for the reference technology?<br><br>The assumed forced outage rate for the Aero Derivative GT used for the CONE calculations according to table 3 of the AESO report listed above is 2.5%. The UCAP value for this unit will therefore likely be slightly less than 93MW.<br><br>It is our view that there should also be an offset calculated for the value of ancillary services.<br><br>**5(1)** The **ISO** must, for every **obligation period**, calculate the energy offset value in accordance with the following formula: $energy\ offsett = (forward\ power\ pricet - energy\ market\ ~~expensetexpenses~~) \times forward\ product\ energyt\ maximum\ capability \times 1000$ | Regarding AFREA's comment on the reference technology, please see section 4.3.2 of the CMD Final Proposal for the criteria that informed the AESO's selection of the reference technology. Based on these selection criteria and stakeholder feedback received through the design process, the AESO determined that an Aero derivative best met the selection criteria. The AESO presented the reference technology selection to the Demand Curve Working Group on August 16, 2018. Please see the AESO's August 16, 2018 presentation "CONE Update, EAS Offset Methodology, CONE Reference Technology" available on the AESO website under the Demand Curve Working Group materials. The AESO also provided an overview of the selection in the AESO's September 13, 2018 consultation session for the Set 3 rules. Please see the AESO's September 13, 2018 "Demand Curve Rules Set 3 Consultation Session" presentation.<br><br>Regarding AFREA's comments on the uniform capacity value for the reference technology, the performance factor for the reference technology is defined in subsection 4 of Proposed Section 207.3, *Shape of Demand Curve* and is based on a historical class average of similar plants operating in Alberta. Please see the AESO's replies to AFREA's comment on subsection 4 of Proposed Section 207.3, *Shape of Demand Curve* in the AESO's Replies to Proposed Section 207.3, *Shape of Demand Curve* matrix.<br><br>The 0.8 performance factor is multiplied by the unit's maximum capability to calculate the uniform capacity value. Therefore, the uniform capacity value of the reference technology is lower than 93 MW.<br><br>The AESO does not agree with the change proposed by AFREA to the formula in subsection 5(1). The AESO excluded ancillary service offsets for the 2021/2022 to 2024/2025 obligation periods, inclusive, due to a lack of appropriate forward products for the ancillary services market. Further, information presented by the AESO to the Demand Curve Working Group indicated that projecting ancillary services revenues can be prone to uncertainty due to the return of the Hydro PPAs and the potential impact on operating reserve pricing. Please see the AESO's June 14, 2018 presentation "Cost of New Entry, Preliminary Estimates, Selection Criteria, Energy and Ancillary Services Offset DCWG #4" on the AESO website under the Demand Curve Working Group materials |

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| Capital Power Corporation ("Capital Power")<br><br>The AESO should consider taxes in the EAS Offset by multiplying the numerator in the formula in the section by (1 – tax rate). If the Gross CONE is being calculated on an after-tax basis (the Brattle report (p. 45) recognizes that corporate income tax rates affect both the cost of capital and cash flows in the financial model used to calculate CONE.), then the EAS Offset should also be calculated on an after-tax basis.<br><br>The rule should specify that the AESO must provide in an ID greater clarity regarding the criteria to be used in the selection of Forward settlements. If a specific period cannot be provided, the AESO must provide the guidelines and criteria that it will use in selecting a representative settlement period. In addition, to avoid potentially unrepresentative price samples, Capital Power suggests that incorporating a traded-volume criteria – a minimum bid ask spread for a minimum duration posted on a recognized exchange or via broker – could also suffice and, in some cases, may be more appropriate.<br><br>Also, Capital Power believes that subsection 5(1)(b) may be prone to confusion as it may give the false impression that the AESO will select the Forward settlement average that maximizes EAS offsets when the intention is to select Forward product that maximizes energy offsets.<br><br>**5(1)** The **ISO** must, for every **obligation period**, calculate the energy offset value in accordance with the following formula:<br><br>$$energy\ \ offset_t = \frac{(forward\ power\ price_t - energy\ market\ expense_t)\ \times forward\ product\ energy_t\ x\ (1 - tax\ rate)}{maximum\ capability\ \times\ 1000}$$<br><br>where:<br>(a) *t* equals the **obligation period** for which the energy offset is being determined;<br><br>(b) *forward power price* $_t$ is the weighted average of the settlements matching the **obligation period** *t*, where the settlements are the average over a period determined by the **ISO**, for the published NGX forward power product in Appendix 1. *The AESO must provide in the associated ID, the criteria to be used in the selection and weighing of Forward settlement periods. The AESO will select the product but not the settlements* that yields the highest energy offset $_t$ for **obligation period** *t*; | The AESO does not agree with the change proposed by Capital Power to subsection 5(1)(b).<br><br>The gross-CONE value already accounts for tax payments and the energy offset is a subset of the total net revenue necessary for entry into the market. If tax were to be included in energy offset value, there may be a double counting of tax costs. Therefore, there is no need to account for taxes in the energy offset value.<br><br>The AESO will determine a time period over which to average settlements that will provide a balanced and reasonable forward power price. The AESO will then select the forward product that yields the highest energy offset based on average settlements. In order to prevent undue influence in forward trades, the specific details of AESO's selection criteria and the selected product will not be disclosed to the market prior to setting net-CONE. The AESO will consider providing information about this process in the associated Information Document. |

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| (c) *energy market expense* $_t$ is the energy market expense value for **obligation period** *t* calculated in accordance with subsection 5(3);<br>(d) *forward product energy* $_t$ is the forward product energy value for **obligation period** *t* calculated in accordance with subsection 5(2); and<br>(e) *maximum capability* is equal to 93 MW. | |
| Capital Power Corporation ("Capital Power")<br>To properly understand net-CONE, a definition for energy and ancillary services offsets is required. See proposed definition to the left consistent with a levelized net-CONE calculation<br>*New definition: "energy and ancillary service revenue (EAS) offsets" means energy, ancillary services and other market services revenues net of variable costs estimated for the refence technology. EAS offsets over the economic life of the asset are entered into a financial cash-flow model employed to estimate Net-CONE for the reference technology.* | The AESO uses defined terms to provide a consistent meaning to terms that are industry specific or not commonly understood across the AESO's authoritative documents (ISO rules, Alberta reliability standards, and the ISO tariff). The AESO is of the view that "energy and ancillary service revenue (EAS) offsets" does not require a definition because it is a specific value defined by the application of the methodology in in Section 207.2 that also varies across obligation periods. |
| Solas Energy Consulting on behalf of the Renewable Energy Coalition ("Solas")<br>In section 206.11, the AESO adjusts the energy offset for wind and other assets that may not capture the average market value of electricity. Some technologies capture higher value than the average market value of electricity and the increased revenue potential should be captured in the calculation of the energy offset.<br>*Subsection 5(1)*<br>$energy\ offset = (forward\ power\ price_t - energy\ market\ expense_t) \times forward\ product\ energy_t\ maximum\ capability \times 1000$ *x technology adjustment factor*<br>*Where technology adjustment factor is the ratio of historical actual energy market revenue to average energy market revenue for the reference technology.* | The AESO does not agree with the change proposed by Solas. The technology adjustment factor is applied in Proposed Section 206.11, *Energy and Ancillary Services Offset for Assets* to characterize the expected revenue for non-dispatchable or price taking assets. It does not need to be applied in Proposed Section 207.2 as the energy offset is being calculated for the dispatchable reference unit. |
| TransAlta Corporation ("TransAlta")<br>The energy offset must:<br>1. Consider and establish a test for liquidity; and<br>2. Include an alternative approach for calculating the energy offset if there is insufficient liquidity in the forward | The AESO does not agree with the changes proposed by TransAlta to introduce a liquidity test for the determination of the energy offset. The AESO acknowledges that the greater the volumes transacted in the forward market (i.e., greater liquidity), the greater the confidence in |

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| prices.<br><br>The AESO's proposed approach completely ignores the liquidity (or lack thereof) of the Forward Power Price, which can will likely bias the determination of energy offset and result in an unrepresentative and artificially low Net-CONE value.<br><br>The energy offset approach must, therefore, consider and establish a measurement for liquidity – rather than simply select the product that yields the highest energy offset. We propose this measurement should be based on the forward product with the highest traded volumes, where those volumes are at least 3 times the maximum capability of the reference technology.<br><br>Furthermore, we reiterate our views related to the flaws inherent in basing the energy offset on forward market prices, which were stated in our CMD 2 comment matrix as well as our design working group comments to the June 14, 2018 session:<br><br>"[F]orward commodity trades three or more years out are extremely illiquid."<br><br>"The entire theoretical basis for using forwards in projects it that forwards represent the collective wisdom of the market, but with so few trades underlying forwards curves, there is no "collective" wisdom to be had."<br><br>"[W]ith such limited trading volume, it would be easy for market participants to schedule a relatively small number of forward trades that could significantly and artificially bias the forward curve upwards or downwards."<br><br>"[F]orward estimates are not truly reflective of dynamics expected in the real-time energy market under an energy and capacity market structure. Forward are currently trading with no regard to the capacity market design, but rather a belief by some participants about how the market may unfold."<br><br>"[F]orward products represent energy blocks and do not provide a way to estimate the hourly prices and curves that are necessary to estimate the revenues of simple cycle gas generation that operates at low capacity factors with a high degree of intra-hour generation variability."<br><br>"Owners of simply cycle gas generation do not sell all of their potential generation in the forward market – they hold long positions to earn their commodity market in the real-time market"<br><br>Additionally, Alberta's forward market is too illiquid to actually enable a generation owner to sell its full volume. | the market's price discovery outcome. However, where there is limited liquidity there will be evidence of price discovery because willing buyers and sellers still transact based on their market outlooks. The AESO is of the view that price discovery between transacting parties will provide a reasonable proxy for energy prices and, therefore, liquidity issues are manageable within the chosen methodology.<br><br>The AESO is of the view that the methodology for the energy offset should be simple, transparent and easily replicable by market participants trying to determine net-CONE estimates. Please see the AESO's reply to Capital Power's comment on subsection 5(1) for the AESO's reason why it is not disclosing the forward product or the period to the market prior to setting net-CONE. The AESO is also of the view that it is within the authority of the Market Surveillance Administrator to monitor anti-competitive conduct in forward contracts.<br><br>The AESO does not agree with TransAlta's suggestion to include the tax rate in the formula for the energy offset. Please see the AESO's reply to Capital Power's comment on subsection 5(1) for the AESO's rationale. |

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| Forward prices may be acceptable if an asset were able to sell all of its production into the forward market, but the lack of liquidity precludes this capability. Moreover, given the illiquidity of the forward market, an attempt to sell a large volume in the forward market could have significant impacts on price levels.<br><br>**5(1)** The **ISO** must, for every **obligation period**, calculate the energy offset value in accordance with the following formula:<br><br>$$energy\ offset_t = \frac{\sout{(forward\ power\ price_t - energy\ market\ expense_t)} margin_t \times (1 - tax\ rate_t) \times forward\ product\ energy_t}{maximum\ capability \times 1000}$$<br><br>where:<br><br>(a) *t* equals the **obligation period** for which the energy offset is being determined;<br><br>(b) margin t is the forward power price t – energy market expense t when forward power price t > energy market expense t otherwise margin t = 0 for obligation period t<br><br>(c~~b~~) *forward power price* $_t$ is the weighted average of the settlements matching the **obligation period** *t*, where the settlements are the average over a period determined by the **ISO**, for the published NGX forward power product in Appendix 1 that: ~~yields the highest energy offset~~ $_t$ ~~for **obligation period** *t*;~~<br><br>(i) traded at volumes at least 3 times the maximum capability;<br><br>(ii) yields the highest traded volume; and<br><br>(iii) in cases where the traded volumes for two or more forward products are equivalent and meet (i), the forward product that yields the highest energy offset t will be used.<br><br>(d~~c~~) *energy market expense* $_t$ is the energy market expense value for **obligation period** *t* calculated in accordance with subsection 5(3);<br><br>(e) tax rate $_t$ reflects all relevant business taxes that would be payable by the owner of the reference technology for obligation period $_t$<br><br>(f~~d~~) *forward product energy* $_t$ is the forward product energy value for **obligation period** *t* calculated in accordance with subsection 5(2); and | |

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| (ge) *maximum capability* is equal to 93 MW. | |
| **Subsection 5(2)** | |
| Capital Power Corporation ("Capital Power")<br><br>Net-CONE should represent an average operating year, as developers make investments for the economic life of assets. As such, the AESO should include an allowance for planned outages in the forward product energy calculation.<br><br>The AESO should provide the source of the forced outage rate and explain the recent change in the proposed rule from 3% to 2.5%.<br><br>5*(2)* *The ISO must, in calculating the energy offset* $_t$ *under subsection 5(1) above, calculate the forward product energy* $_t$ *in accordance with the following formula*:<br><br>$$forward\ product\ energy_t = average\ capacity \times (1 - (forced\ outage\ rate + \text{planned outage rate})) \times forward\ product\ hours_t$$<br><br>where:<br><br>(a) *t* equals the **obligation period** for which the generation is being determined;<br><br>(b) *average capacity* is equal to 87 MW;<br><br>*(c)* *forced outage rate* is equal to 2.5%; ~~*and*~~<br><br>*(d)* *planned outage rate is equal to x%; and*<br><br>*(e)* *forward product hours* $_t$ is the number of hours defined in the ICE NGX Contracting Party Agreement for the forward power product associated with the forward power price in subsection 5(1)(iii), for **obligation period** *t*. | The AESO does not agree with Capital Power's proposal to include planned outages in the forward product energy calculation. The calculation of the net-CONE value is premised on the reference technology being in its first year of operation and that the reference technology can run base load for the entire year without a planned outage. Therefore, there is no basis for including planned outages in the calculation.<br><br>The forced outage rate of 3% was based on a preliminary estimate. The forced outage rate was updated to 2.5% in the Cost of New Entry Analysis published on August 31, 2018 (titled AESO Cost of New Entry Analysis: Combustion Turbines and Combined-Cycle Plants with November 1, 2021 Online Date) on the AESO website. Please see page 10 of that report. The AESO inadvertently erred in updating the value in the August 31, 2018 version of Proposed Section 207.2. |

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| TransAlta Corporation ("TransAlta")<br><br>The energy offset value must be filed with and approved by the AUC a simulation based-approach should be used to calculate the energy offset if the forward prices fail the liquidity test outlined in the previous section.<br><br>We have proposed this new subsection to reflect the use of a simulation-based approach for energy offset, should the forward prices fail the liquidity test outlined in the previous section. The simulation based model could be developed by an independent consultant and/or the AESO, and subsequently reviewed and approved in the AUC process. The simulation-based model should be based upon the same assumptions of supply and demand included in the probabilistic model of resource adequacy described in Section 207.1: Gross Minimum Procurement Volumes.<br><br>5(2) The ISO must, for every obligation period where the energy offset value calculated above has insufficient liquidity or the forward price is not reflective of market fundamentals, use a simulation-based model to calculate the energy offset value in accordance with:<br><br>(a) an hourly forecast of power prices for obligation period $_t$;<br><br>(b) the assumptions used in the probabilistic model of resource adequacy (Section 207.1: Gross Minimum Procurement Volume); and<br><br>(c) the forecast dispatch of the reference technology from a simulation based model based upon its operating parameters and modeled as a hypothetical new entrant. | The AESO does not agree with TransAlta's proposal for a simulation based approach. The AESO is of the view that the methodology for determining the energy offset should be simple, transparent and easily replicable by market participants trying to determine net-CONE estimates. A simulation approach is significantly more complex, open to assumption and difficult to replicate. Therefore, it is not aligned with the AESO's objectives. As noted in the AESO's June 14, 2018 presentation "Cost of New Entry Preliminary Estimates Selection Criteria & E&AS Offset" to the Demand Curve Working Group, the AESO conducted a comparison and determined that a simulation approach would not result in any accuracy gains or improvements relative to the forward market approach.<br><br>TransAlta proposes that the AESO adopt a liquidity threshold, and if the test fails, use a market simulation-based approach to calculate energy offset. Please see the AESO's replies to TransAlta's comments on subsections 5(1) and 5(2) above. |
| TransAlta Corporation ("TransAlta")<br><br>Generator forced and planned outage rates, as well as plant economics, must be considered in the Forward Product Energy calculation.<br><br>The AESO's proposed approach overestimates the amount of energy that can be sold forward because it ignores planned outages. No generator can avoid the need to take planned outages. As a result, the AESO's approach incorrectly overstates the energy offset and understates Net-CONE value – which could threaten system reliability by failing to attract new capacity when needed.<br><br>The calculation of Forward Product Energy must account for the average of forced and planned outages as well as | The AESO does not agree with TransAlta's proposal to include planned outages in the forward product calculation. Please see the AESO's reply to Capital Power's comment on subsection 5(1) above.<br><br>Dispatch of the reference asset is captured by assessing multiple forward products (base load, peak, extended peak), where each has different output shape for a reference power plant. The AESO acknowledges that this approach may not capture intra-hour dispatchability to the same extent that a market simulation approach would. However, please see the AESO's reply to TransAlta's comment on subsection 5(2) above regarding the AESO rejection of a simulation |

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| the economic operations for the reference technology over its useful life. The reference technology cannot be assumed to operate during all hours when it is available for dispatch because it would be very costly to operate in periods where the reference technology cannot earn a positive margin. This further overstates the expected revenues for the reference technology and biases the calculation of energy offset to be unrealistically high, resulting in a further understated Net-CONE.<br><br>We have also provided references to new terms, e.g. Reference Technology Average Capacity, which should be added to the Consolidated Authoritative Document Glossary, so they can be easily changed without the need to amend this Section 207.2. These new terms should replace hardcoded values.<br><br>Additionally, the Forward Product Hours must be adjusted to reflect expected hours of operation for the reference technology. In cases where the Simulation Based Power Price is used, Expected Hours of Operations would be estimated using the information in the simulation model. In cases where the Forward Power Price is used, Expected Hours of Operations should be estimated using the historical data of the run times for existing generators of the same technology as the Reference Technology.<br><br>**5(~~32~~)** The **ISO** must, in calculating the energy offset $_t$ under subsection 5(1) above, calculate the forward product energy $_t$ in accordance with the following formula:<br><br>$$forward\ product\ energy_t =$$<br>$$reference\ technology\ average\ capacity$$<br>$$\times\ (1 - \sout{forced\ outage\ rate} reference\ technology\ unavailability\ rate)$$<br>$$\times\ forward\ product\ hours_t\ \times \text{expected hours of operation}$$<br><br>where:<br><br>(a) *t* equals the **obligation period** for which the generation is being determined;<br><br>(b) ~~*average capacity* is equal to 87 MW~~ *reference technology average capacity* is a term defined in the Consolidated Authoritative Document Glossary;<br><br>(c) ~~*forced outage rate* is equal to 2.5%~~ *reference technology unavailability rate* is a term defined in the Consolidated Authoritative Document Glossary;; and | approach.<br><br>Adding historical data to the forward market methodology will raise representation issues. The historical run times of existing generators may be influenced by portfolio behaviour considerations, which may not be completely applicable to a new merchant asset (which is the premise of a reference technology unit). As such, the expected hours of operations may not represent the competitive behaviour the AESO aims to capture with the forward market approach.<br><br>Please see the AESO's reply to TransAlta's comment on subsection 9(2) in the AESO's Replies to Proposed Section 206.1, *Qualification of Capacity* for the AESO's reply to TransAlta's proposal regarding the removal of hard-coded values from the rule. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| (d) *forward product hours* $_t$ is the number of hours defined in the ICE NGX Contracting Party Agreement for the forward power product associated with the forward power price in subsection 5(1)(iii) multiplied by the expected hours of operations t for the reference technology, for **obligation period** t.<br>(e) expected hours of operations $_t$ is the estimated number of hours calculated using the average historical 12 months of run times of existing resources of the same technology type as the reference technology | |
| TransAlta Corporation ("TransAlta")<br><br>This new subsection is added to support the addition of an alternative, simulation-based approach for calculating the energy offset value, as originally outlined in the new subsection 5(2).<br><br>We have proposed this new subsection to reflect the use of a simulation-based approach, if there is insufficient liquidity in the forward prices. The terms of this new section are largely the same, but adds Dispatched Product Hours t, which is based on the number of hours the reference technology is dispatched in the energy market under the simulation-based approach. This dispatch is in consideration of the following: forecasted real-time energy prices, asset costs including variable, start-up and cycling, and maintenance costs as well as other restrictions on generation including regulatory requirements and permit restrictions.<br><br>5(4) The ISO must, in calculating the energy offset $_t$ under subsection 5(2), calculate the simulation based product energy $_t$ using the following formula:<br><br>simulation based product energy $_t$ = reference technology average capacity x (1 – reference technology unavailability rate) x dispatched product hours $_t$<br><br>where:<br>(a) t equals the obligation period for which the generation is being determined;<br>(b) reference technology average capacity is a term defined in the Consolidated Authoritative Document Glossary;<br>(c) reference technology unavailability rate is a term defined in the Consolidated Authoritative Document Glossary; and<br>(d) dispatched product hours $_t$ is the number of hours that the reference technology is expected to be dispatched for during the obligation period $_t$ taking into account costs including start up and cycling costs, regulatory requirements, maintenance costs and pool prices. | The AESO does not agree with the change proposed by TransAlta. Please see the AESO's reply to TransAlta's comments on subsections 5(1) and 5(2) above. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| **Subsection 5(3)** | |
| Capital Power Corporation ("Capital Power")<br><br>Capital Power submits that the energy market trading charge should be escalated by inflation given the high likelihood that the figure will be periodically updated before the delivery year.<br><br>*5(3) The ISO must, in calculating the energy offset t under subsection 5(1), calculate the energy market expense t in accordance with the following formula:*<br><br>$energy\ market\ expense_t =$<br><br>$[forward\ gas\ price_t \times (1 + commodity\ fuel\ charge_t)] \times heat\ rate_t$<br>$+ variable\ operations\ and\ maintenance_t$<br>$+ (emission\ intensity - established\ benchmark_t) \times carbon\ price_t$<br>$+ transmission\ loss_t + trading\ charge_t$ *x (1 + inflation)*<br><br>*5(3)(j) energy market trading charge t x (1 + inflation) is the most recent energy market trading charge published on the AESO website .multiplied by the expected cumulative inflation from the AESO's most recent published market trading charge to the delivery period.* | The AESO does not agree with the change proposed by Capital Power. Different components of the energy market trading charge are set by regulatory formulas that are not directly tied to inflation. Approximating or projecting the growth of the trading charge would therefore be a complex operation that is subject to varying assumptions and uncertainty. The AESO chose to base the energy market trading charge on the most recent published value to keep the forward market methodology simple, transparent and easily replicable by market participants trying to determine net-CONE estimates. |
| TransAlta Corporation ("TransAlta")<br><br>Hedging costs and Expected Capacity Performance Penalties should be included in the formula for energy market expense; and the language and references to terms should be changed to:<br>1. Reference the alternative, simulation-based approach for energy offset; and<br>2. Make Section 207.2 a permanent ISO Rule.<br><br>We have proposed our recommended changes to the rule language to:<br><br>1) add a reference to hedging costs and expected capacity performance penalties for the reference technology;<br><br>2) reference the alternative, simulation-based approach that we have recommended;<br><br>3) the addition of terms we believe should be added to the Consolidated Authoritative Document Glossary so that | The AESO does not agree with the changes proposed by TransAlta to subsection 5(3). The inclusion of hedging costs in the formula in subsection 5(3) requires the AESO to make assumptions about hedging costs, which are based on financial information, such as credit ratings, which varies across different firms and is not freely available. Estimating net-CONE would be significantly more complex for market participants and, therefore the inclusion of hedging costs is contrary to the AESO's principles of simplicity, transparency and replicability.<br><br>Similarly, the methodology for calculating under delivery and under-availability adjustments in the capacity market is dependent on a number of assumptions and will be difficult to duplicate. In addition, the risk of under-performance adjustments for the reference technology |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| changes can be made without the need to amend Section 207.2 (i.e. making 207.2 a permanent ISO Rule).<br><br>**5(~~53~~)** The **ISO** must, in calculating the energy offset $_t$ under subsection 5(1) and 5(2), calculate the energy market expense $_t$ in accordance with the following formula:<br><br>$energy\ market\ expense_t = [forward\ gas\ price_t \times (1 + commodity\ fuel\ charge_t)] \times reference\ technology\ heat\ rate_t + variable\ operations\ and\ maintenance_t + (reference\ technology\ emission\ intensity - established\ benchmark_t) \times carbon\ price_t + transmission\ losses_t + trading\ charge_t + hedging\ costs_t + expected\ capacity\ performance\ penalties_t$<br><br>where:<br>(a) *t* equals the **obligation period** for which the energy offset is being determined;<br>(b) *forward gas price* $_t$ is the weighted average of the settlements matching the **obligation period** *t*, where the settlements are the average over the period determined by the **ISO** in subsection 5(1)(b), of NGX Phys, FP (CA/GJ), AB-NIT;<br>(c) *commodity fuel charge* $_t$ is the most recent 12 **month** average of published NOVA Gas Transmission Ltd NGTL Fuel Usage and Measurement Variance;<br>(d) *reference technology heat rate* is ~~equal to 9.677 GJ/MWh~~ a term defined in the Consolidated Authoritative Document Glossary;<br>(e) *variable operations and maintenance* $_t$ is the variable operations and maintenance value for **obligation period** *t* calculated in accordance with subsection 5(4);<br>(f) *reference technology emission intensity* is ~~equal to 0.50 tonnes of $CO_2$/MWh~~ a term defined in the Consolidated Authoritative Document Glossary;<br>(g) *established benchmark* $_t$ is the weighted average of the calendar year values matching **obligation period** *t* for an established benchmark for electricity published by a public authority;<br>(h) *carbon price* $_t$ is the weighted average of the calendar year values matching **obligation period** *t* for the carbon price published by a public authority; | is low because of the characteristics of an aero derivative unit.<br><br>Please see the AESO's reply to TransAlta's comment on subsection 5(1).<br><br>Please see the AESO's reply to TransAlta's comment on subsection 3 above for the AESO's reply to TransAlta's proposal on removing hard-coded values from the rule. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| (i) *transmission losses* $_t$ is the transmission loss value for **obligation period** *t* calculated in accordance with subsection 5(5); and<br>(j) *energy market trading charge* $_t$ is the most recent energy market trading charge published on the AESO website.<br>(k) hedging cost t is the estimated cost based upon a historical analysis of the premium charged to purchase back power that cannot be physically delivered to meet the requirement of the forward product during obligation period t;<br>(l) expected capacity performance penalties t is the expected availability and delivery payment adjustments under Section 206.8: Obligation Period Performance Assessment for the reference technology during obligation period t. | |
| **Subsection 5(4)** | |
| TransAlta Corporation ("TransAlta")<br>**5(64)** The **ISO** must, in calculating the energy market expense $_t$ under subsection 5(3), calculate the variable operations and maintenance $_t$ value in accordance with the following formula:<br>$$variable\ operations\ and\ maintenance_t = initial\ variable\ operations\ and\ maintenance_{\sout{t=2021/2022}} \times \frac{materials\ index_t}{\sout{118.5}\ material\ index\ factor}$$<br>where:<br>(a) *t* equals the **obligation period** for which the variable operations and maintenance is being determined;<br>(b) *initial variable operations and maintenance* $_{\sout{t=2021/2022}}$ ~~is equal to $4.60/ MWh~~ is a term defined in the *Consolidated Authoritative Document Glossary*; ~~and~~<br>(c) *material index factor* is a term defined in the *Consolidated Authoritative Document Glossary*; | The AESO does not agree with the changes proposed by TransAlta. Please see the AESO's reply to TransAlta's comment on subsection 9(2) in the AESO's Replies to Proposed Section 206.1, Qualification of Capacity. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| (d~~e~~) *materials index* $_t$ is the value in subsection 4(2)(d).<br><br>The language and references to terms have been changed to make Section 207.2 a permanent ISO Rule. We recommend removing hardcoded values and adding new terms to the Consolidated Authoritative Document Glossary, so they can be updated with amendments to the definitions without the need to amend Section 207.2 (i.e. making 207.2 a permanent ISO Rule). | |
| **Subsection 5(5)** | |
| TransAlta Corporation ("TransAlta")<br><br>This subsection should include a reference to the Power Price to support the addition of an alternative, simulation-based approach to the energy offset, and associated simulation-based power prices.<br><br>We have proposed these changes to clarify the calculation of Transmission Losses when forward prices or simulation based power prices are applied as contemplated in 5(1)(b) and 5(2) above.<br><br>**5(7~~5~~)** The **ISO** must, in calculating the energy market expense $_t$ under subsection 5(2), calculate the transmission losses $_t$ value in accordance with the following formula:<br><br>$$transmission\ losses_t = \frac{\sum_{i=1}^{n} loss\ factor_i}{n} \times \text{~~forward~~}\ power\ price_t$$<br><br>where:<br><br>(a) *t* equals the **obligation period** for which the transmission losses is being determined;<br><br>(b) *i…n* are facilities located in the Fort Saskatchewan area identified in the most recent loss factors published on the AESO website;<br><br>(c) *loss factor* $_i$ is the most recent published loss factor values published on the AESO website; and<br><br>(d) ~~*forward*~~ *power price* $_t$ is the *forward power price t* value in subsection 5(1)(b) or the simulation based power price t value in subsection 5(2). | The AESO does not agree with the changes proposed by TransAlta. Please see the AESO's replies to TransAlta's comments on subsections 5(1) and 5(2) above. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| **Calculation of Net-CONE**<br>**Subsection 6(1)** | |
| Capital Power Corporation ("Capital Power")<br><br>Market rules in other markets define CONE and net-CONE. For example, Net-CONE is defined in ISO New England's tariff, section I.2.2. It is critical to conceptually define net-CONE to guide the practical application. See proposed definition to the left. Currently, it is unclear to stakeholders what the net- CONE value represents, if it is consistent with Brattle's nominal levelized approach, and why it does not seem to represent an expectation about future cost recovery over the economic life of the asset.<br><br>*New definition: "net-CONE" is a non-negative number that represents CONE net of the first-year non-capacity market revenues, for a reference technology resource type and is intended to equal the amount of capacity revenue the reference technology resource would require, in its first year of operation, to be economically viable given reasonable expectations of the first year energy and ancillary services revenue (EAS) offsets, and projected EAS offsets over its economic life.* | The AESO uses defined terms to provide a consistent meaning to terms that are industry specific or not commonly understood across the AESO's authoritative documents (ISO rules, Alberta reliability standards, and the ISO tariff). The AESO is of the view that "net-CONE" does not require a definition because it is a specific numerical value that is defined by the methodologies in subsection 6(1) of Proposed 207.2. |
| Capital Power Corporation ("Capital Power")<br><br>To properly understand net-CONE in the demand curve context, adjusted net-CONE must be defined. Market participants also need clear understanding of the rationale for the adjustment. See proposed definition to the left.<br><br>*New definition: "adjusted net-CONE" means net-CONE adjusted for the performance factor of the reference technology in order to represent net-CONE in uniform capacity terms and be used in the demand curve.* | The AESO uses defined terms to provide a consistent meaning to terms that are industry specific or not commonly understood across the AESO's authoritative documents (ISO rules, Alberta reliability standards, and the ISO tariff). The AESO is of the view that "adjusted net-CONE" does not require a definition because it is a specific numerical value that is defined by the application of the methodology in subsection 4 of Proposed 207.3, *Shape of Demand Curve*. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| **Publication of Net-CONE, Data and Indices**<br>**Subsection 7** | |
| Capital Power Corporation ("Capital Power")<br>The AESO should consider taxes in the EAS Offset by multiplying the numerator in the formula in subsection 5(1) by (1 – tax rate). If the Gross CONE is being calculated on an after-tax basis (the Brattle report (p. 45) recognizes that corporate income tax rates affect both the cost of capital and cash flows in the financial model used to calculate CONE.), then the EAS Offset should also be calculated on an after-tax basis.<br>*New subsection 7(u): the combined federal and provincial corporate tax rate* | The AESO does not agree with the change proposed by Capital Power. Please see the AESO's reply to Capital Power's comment on subsection 5(1) above. |
| TransAlta Corporation ("TransAlta")<br>The references to terms and subsections have been changed to reflect the changes proposed above.<br>**7** The **ISO** must, publish the net-CONE value determined in accordance with this section 207.2 and the following data and indices in the *Capacity Market Auction Guidelines* for each **base auction** and **rebalancing auction**:<br>(a) initial composite index ~~t=2021/2022~~ ;<br>(b) composite index $_t$ ;<br>(c) labour index $_t$ ;<br>(d) material index $_t$ ;<br>(e) turbine index $_t$ ;<br>(f) USD/CAD Foreign Exchange Rate $_t$ ;<br>(g) energy market expense $_t$ ;<br>(h) forward power price $_t$ ;<br>(i) forward product hours $_t$ or simulation based power price t (as applicable);<br>(j) forward product energy $_t$ ;<br>(k) the period determined by **ISO** see in subsections 5(1)(~~c~~b), 5(2)(~~a~~d) and 5(~~4~~3)(~~d~~b) ; | The AESO does not agree with the changes proposed by TransAlta. Please see the AESO's replies to TransAlta's comments on subsection 5(1) and 5(2) above. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| (l) forward gas price $_t$ ;<br>(m) commodity fuel charge $_t$ ;<br>(n) variable operations and maintenance $_t$ ;<br>(o) emission intensity;<br>(p) established benchmark $_t$ ;<br>(q) carbon price $_t$ ;<br>(r) transmission losses $_t$ ;<br>(s) loss factor $_t$ ; and<br>(t) trading charge $_t$ ~~-~~;<br>(u) hedging costs t ;<br>(v) expected capacity performance penalties t ;<br>(w) tax rate t ; and<br>(x) expected hours of operations t. | |
| **Applicable Auctions**<br>**Subsection 9** | |
| Capital Power Corporation ("Capital Power")<br><br>Subject to the AUC's further consultation and amendments to AUC Rule 017 on application of ISO rules that pertain to the demand curve and related elements of the capacity market, the rule should provide the governance framework and stakeholder consultation process including timelines that the AESO will follow to develop the subsequent set of rules.<br><br>Also, subject to the AUC Rule 017 amendments, the AESO rules should specify the requirements and process that the AESO will follow to update the load forecast, reliability requirement, net-CONE and demand curve between each of the obligation periods described in this Section 7. The timelines, information to be disclosed by the AESO and engagement process should be specified for main and rebalancing auctions.<br><br>*This Section 207.2 is in effect for the following auctions:* | Please see the AESO's reply to Capital Power's comment on subsection 7 in the AESO's Replies to Proposed Section 207.1, *Gross Minimum Procurement Volume*. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| *(a) the base auction and rebalancing auction for the 2021/2022 obligation period;*<br>*(ab) the base auction and rebalancing auction for the 2022/2023 obligation period;*<br>*(ac) the base auction and rebalancing auction for the 2023/2024 obligation period; and*<br>*(ad) the base auction and rebalancing auctions for the 2024/2025 obligation period.* | |
| TransAlta Corporation ("TransAlta")<br>Section 207.2 should be a permanent rule and should not be specific to only apply for the first four obligation periods. Therefore, this subsection should be removed.<br>~~**10** This section 207.2 is in effect for the following auctions:~~<br>~~(a) the **base auction** and **rebalancing auction** for the 2021/2022 **obligation period**;~~<br>~~(a) the **base auction** and **rebalancing auction** for the 2022/2023 **obligation period**;~~<br>~~(a) the **base auction** and **rebalancing auction** for the 2023/2024 **obligation period**; and~~<br>~~(a) the **base auction** and **rebalancing auctions** for the 2024/2025 **obligation period**.~~ | The AESO does not agree with the change proposed by TransAlta. Please see the AESO's reply to TransAtla's comment on subsection 7 in the AESO's Replies to Proposed Section 207.1, *Gross Minimum Procurement Volume*. |
| **Appendix 1 – List of Forward Power Products** | |
| Capital Power Corporation ("Capital Power")<br>The AESO must only list the forward power products that it intends to evaluate in the calculation of energy offsets for the reference technology taking into consideration the liquidity of these products several years in advance of delivery or obligation period.<br>In the event that the AESO lists less liquid products, the AESO should explain how the proposed Forward curves are expected to be utilized. This has not been explained in the associated IDs.<br>*Appendix 1 – List of Forward Power Products*<br>*Forward Power Product Names on NGX:*<br>*NGX Fin FUT FF, FP for AESO Flat* | The AESO does not agree with the change proposed by Capital Power. Please see the AESO's reply to Capital Power's and TransAlta's comments on subsection 5(1) above. |

| Stakeholder Comments and/or Proposed Alternative Rule Wording | AESO Replies |
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| ~~*NGX Fin FUT FF, FP for AESO Ext Off Peak*~~<br>~~*NGX Fin FUT FF, FP for AESO Ext Peak*~~<br>~~*NGX Fin FUT FF, FP for AESO Off Peak*~~<br>*NGX Fin FUT FF, FP for AESO On Peak*<br>~~*NGX Fin FUT FF, FP for AESO Super Peak*~~<br>~~*NGX Fin FUT FF, FP for AESO Hourly*~~ | |

***Please provide your comments on the following (as set out in AUC Rule 017 s. 13(b-j)):***

| Item # | | Stakeholder comments | AESO Replies |
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| 1 | whether you agree that Section 207.2 of the ISO Rules, *Calculation of Net-CONE* relates to the capacity market and why or why not | Capital Power Corporation ("Capital Power")<br>Capital Power agrees that the proposed rule relates to the capacity market and, in general, is necessary to determine the net-CONE. | The AESO acknowledges Capital Power's comment. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>Yes, it relates. It is a key component in the capacity market. | The AESO acknowledges Capital Power's comment. |
| 2 | whether you agree that Section 207.2 of the ISO Rules, *Calculation of Net-CONE* should or should not be in effect for a fixed term and why or why not | Capital Power Corporation ("Capital Power")<br>Capital Power understands that CONE, net-CONE and the demand curve are proposed to be re-set every 3 or 4 years and therefore agrees with the rationale for prescribing a fixed term for the proposed rule as proposed in subsection 7. | The AESO acknowledges Capital Power's comment. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>Considering the many unknowns that will affect the market and the uncertainty inherent in any new design, a short fixed term would be appropriate to allow a revision if necessary. This value is fundamental to the market design and therefore it should be reviewed to ensure that it is correct. | Please see the AESO's reply to the UCA's comment on Item #10 below. |

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| 3 | whether you understand and agree with the objective or purpose of Section 207.2 of the ISO Rules, *Calculation of Net-CONE* and whether, in your view, Section 207.2 of the ISO Rules, *Calculation of Net-CONE* meets the objective or purpose | Capital Power Corporation ("Capital Power")<br>Capital Power has no comments at this time. | |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>Yes, we understand and agree with the objective of the rule but we are not convinced that the calculations best reflect CONE or that the reference technology is the correct one. From this gross CONE value the net CONE is derived and if that value is too high it will lead to over-procurement and if it is too low it will lead to under-procurement. | The AESO acknowledges the UCA's comment. |
| 4 | how, in your view, Section 207.2 of the ISO Rules, *Calculation of Net-CONE* affects the performance of the capacity market and the electricity market | Capital Power Corporation ("Capital Power")<br>The proposed energy offset methodology may be prone to volatility and adversely affect investor confidence and the performance of the capacity market. Limited Forward market liquidity three or more years out suggests that forward prices can change drastically from the net-CONE calculation to delivery period and from auction to auction, not to mention that Forwards are more volatile relative to fundamental forecasts. The fact that the type of Forward curve (flat, on-peak, supper-peak) that maximizes energy offset value can change from one auction to the next, further increases the uncertainty around Net-CONE, inflicting further damage on markets performance. | Please see the AESO's replies to TransAlta's November 14, 2018 comment on subsection 5(2) above. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>The AESO chose the most expensive generator as the reference technology. The UCA is concerned that this will set the Net-CONE | Please see the AESO's reply to AFREA's comment on subsection 5(1) above. |

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| | | value too high and result in high costs to consumers. | |
| 5 | your views on any analysis conducted or commissioned by the AESO supporting Section 207.2 of the ISO Rules, *Calculation of Net-CONE* | Capital Power Corporation ("Capital Power")<br>There is lack of analysis that supports the energy offset methodology. The approach results in unrealistic operations and capacity factors. Furthermore, the resulting net-CONE does not represent the levelized missing money over the life of the asset. The methodology fails to account for changes in energy revenue potential as the Alberta fleet changes and movements in energy prices over time. | Please see the AESO's replies to Capital Power's comment on subsection 5(1) above.<br>On August 16, 2018, the AESO presented its assessment to the Demand Curve Working Group on the on the merits and drawbacks of the energy offset methodology versus a simulation approach. Please see the AESO's August 17, 2018 presentation "CONE Update EAS Offset Methodology CONE Reference Technology Selection".<br>Levelizing the energy offset results over the life of the asset would, by design requires a long-term simulation of the market. Please see the AESO's reply to TransAlta's comment on subsection 5(2) above for why the AESO rejected a simulation approach. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>See Item #3. | Please see the AESO's reply to UCA's comment on Item #3 above. |
| 6 | whether you agree with Section 207.2 of the ISO Rules, *Calculation of Net-CONE* taken together with all ISO rules and in light of the principle of a fair, efficient and openly competitive market | Capital Power Corporation ("Capital Power")<br>Capital Power has no comments at this time. | |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>The structure of the rule is fine but if the CONE numbers are too high it will impact the efficiency and the competitiveness of all the markets. | The AESO acknowledges UCA's comment. |

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| 7 | whether you would suggest any alternatives to Section 207.2 of the ISO Rules, *Calculation of Net-CONE* | Capital Power Corporation ("Capital Power")<br>The energy offset methodology would be conceptually stronger if it was complemented with simulations since it could (depending on how it is implemented) actually represent the levelized costs of entry. The simulation approach would limit potential energy offset volatility and anchor the results closer to realistic operations. | Please see the AESO's replies to TransAlta's comment on subsection 5(2) above. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>No comment. | |
| 8 | whether you agree that the proposed provisional rule supports ensuring a reliable supply of electricity at a reasonable cost to customers and why or why not | Capital Power Corporation ("Capital Power")<br>Capital Power has reservations regarding the AESO's energy offset calculation and the financial assumption used by Brattle that may affect ensuring a reliable supply of electricity at a reasonable cost to customers. On the other hand, the proposed aeroderivative technology supports the entry of resources that better fit the unique nature of the Alberta market and better address the uncertainty around the actual units that will get built in the future. Importantly, the selection of aeroderivative allows a greater set of resources to compete, reduces the risk of market failure and poor reliability risk. In addition, it allows reasonable prices to be achieved through competition. | The AESO acknowledges Capital Power's comments. |
| | | TransAlta Corporation ("TransAlta")<br>Please see Appendix 1 of TransAlta's submission. | Please see the AESO's replies to Appendix 1 of TransAlta's November 14, 2018 submission in the AESO Replies to TransAlta's Appendix 1 matrix. |
| | | Utilities Consumer Advocate ("UCA")<br>The cost may not be reasonable for the reasons stated. | Please see the AESO's reply to UCA's comment on Item #10 below. |

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| 9 | whether you agree that the proposed provisional rule supports the public interest and why or why not | Capital Power Corporation (“Capital Power”)<br>Capital Power has no comments at this time. | |
| | | TransAlta Corporation (“TransAlta”)<br>Please see Appendix 1 of TransAlta’s submission. | Please see the AESO’s replies to Appendix 1 of TransAlta’s November 14, 2018 submission in the AESO Replies to TransAlta’s Appendix 1 matrix. |
| | | Utilities Consumer Advocate (“UCA”)<br>If the cost is too high the public interest is not supported. | The AESO acknowledges the UCA’s comment. |
| 10 | whether you have any additional comments | Alberta Federation of Rural Electrification Associations (“AFREA”)<br>AFREA continues to review the voluminous comments from other stakeholders and, as such, refrains from any final position on this proposed rule. AFREA reserves the right to comment in further proceedings or processes about this or other ISO rules, and its impact on consumers in general and REA members specifically.<br>Where applicable, AFREA comments upon the rationale of its changes which, in its view clarify the rule, align it more closely to the public interest, provide for greater reliability at a more reasonable cost, clarify the implementation of the capacity market, or a combination therein. In AFREA’s view, the public interest includes a balance between reliable supply of electricity with a reasonable cost to consumers. | The AESO acknowledges AFREA’s comment. |
| | | Capital Power Corporation (“Capital Power”)<br>The AESO should provide the source of the forced outage rate in the energy offset calculation and explain the recent change in the proposed rule from 3% to 2.5%. | The response to this has been provided above under ss. 5(2) |
| | | TransAlta Corporation (“TransAlta”)<br>Please see Appendix 1 of TransAlta’s submission. | Please see the AESO’s replies to Appendix 1 of TransAlta’s November 14, 2018 submission in the AESO Replies to TransAlta’s Appendix 1 matrix. |
| | | Utilities Consumer Advocate (“UCA”) | The gross-CONE analysis conducted by Brattle employs different methodologies and was developed for a different purpose than the analysis conducted for the |

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| | | The UCA is concerned that the analysis used to determine the gross-CONE value did not align with the conclusions that were arrived at by the AUC in Proceeding 22570 and hence the number may be too high. We are also concerned that there are gaps in the analysis that need to be filled in before the Brattle work can be accepted. For example, Brattle included both U.S. and Canadian investors in their analysis and the AUC stated they did not believe these jurisdictions to be comparable. Brattle used bankrupt companies and no longer existing companies in their samples; these companies should be excluded from the study.<br><br>The UCA is concerned about the use of adjusted Fairness Opinions. No detail is provided about how these adjustments were made to account for differences in the risk-free rates between the US and Canadian markets and for changes in the market conditions between the time they were reported and 2021. Then Brattle uses the very top end of the fairness opinions to reflect the higher risk for merchant investors in Alberta. How they got to this level is a gap that needs to be tested. In the GCOC decision, the AUC found that there was no basis to support the idea that there is higher regulatory risk in Alberta. Likewise, Brattle has provided no basis for this conclusion. Simply stating it is so does not make it so.<br><br>More detail on how the beta range, used by Brattle, was determined needs to be provided.<br><br>The AESO should consider revisiting the CONE and reference technology after it has gained some experience. The UCA suggests revisiting after the 2022/2023 auctions. | generic cost of capital (GCOC) in Proceeding 22570. A fundamental difference is that Brattle, in estimating the value of gross-CONE, did not rely on any estimates for the cost of capital of regulated utilities. Due to the different nature and risks of the underlying business investments assumed in the gross-CONE study (for merchant generation investments) compared to the GCOC proceeding (for regulated transmission and distribution utilities), Brattle did not apply the same cost-of-capital data and analysis used for the GCOC. Specifically, the financial data and fairness opinions underpinning the gross-CONE study relied on comparable merchant generation companies (whereas the GCOC analysis was based on regulated entities). Similarly, the cost of debt assumptions and considerations embedded in the cost of capital formula are unique to risks of merchant generation investments in Alberta (rather than regulated utilities).<br><br>For the selection of comparable merchant generation companies, Brattle included Canadian and U.S-based publicly listed companies that have a similar risk profile to potential companies entering the Alberta market. Although two generation companies of the sample have merged with other entities since the gross-CONE study was conducted, the data used from these companies was based on historical financial performance prior to the respective merger and acquisition announcements.<br><br>The gross-CONE report provides extensive analysis and commentary on how adjustments from Fairness Opinions and the sample of comparable generation companies factor market conditions in Alberta. Specifically, the report details how financial data (including beta) and market risks are assessed. The report also documents Brattle's analysis and judgment in recommending a cost of capital estimate. Please see pp. 30-47 of AESO Cost of New Entry Analysis: on the AESO website.<br><br>The AESO indicated in CMD Final that it would submit updated gross-CONE studies on a cyclical basis. Please see section 4.3.5 of the CMD Final Rationale. In the AESO's September 13, 2018 stakeholder consultation session on the Set 3 rules, the AESO indicated that it expects to revisit the demand curve rules in and around the beginning of 2022 time, which is after the conclusion of the 2022/2023 base auction. |