



29 October 2019

Attention: [REDACTED]

Dear [REDACTED],

In a letter on July 25, 2019, the Alberta Minister of Energy directed the Alberta Electric System Operator (AESO) to provide advice regarding market power and market power mitigation by November 29. On October 8, the AESO asked the Market Surveillance Administrator, market participants, and other interested parties to provide feedback on the topic of market power mitigation in both the energy and operating reserves market by October 29.

Heartland Generation Ltd. (HGL) appreciates the opportunity to provide input on market power and market power mitigation given the decision to retain the existing energy-only market. Alberta's current wholesale electricity market design relies on generators raising price above marginal cost in the short-run to recover their fixed costs over the long-run, earn a reasonable return, and invest in the market. It is therefore important to recognize that there is an efficient level of market power in the supply of electricity in Alberta.

History shows that our current market design has delivered adequate capacity at a reasonable cost through effective competition. Forward-looking analysis indicates that it will continue to do so. HGL therefore submits that additional market power mitigation is not warranted.

Alternative market designs involving ex-ante mitigation are highly administrative and thus costly, burdensome, and prone to error. Given the small static efficiency losses associated with our current market design and its continued provision of adequate reliability at reasonable cost, it is unlikely that the benefit, if any, of implementing an alternative administrative design outweighs the cost of doing so. We should therefore maintain our current market design and continue to focus on the ex-post monitoring of conduct that creates, enhances, or maintains market power.

Likewise, the operating reserves market does not require any additional market power mitigation. The existing mitigation framework in the operating reserves market should continue, including ex-post review, maximum size of combined non-hydro offers, and the clearing price capped by the AESO's bid price.

With respect to Alberta's electricity agencies, HGL submits that they continue to have roles in Alberta's market power mitigation framework. These functions include:

- Surveillance of conduct that creates, enhances, or maintains market power.
- Timely publication of data/reports in usable format to promote and enhance market transparency.
- Support market rules that sustain the fair, efficient, and openly competitive operation of the market.



In conclusion, HGL submits that the market has been and will continue to be effectively competitive. Deviating from the existing market design is both unnecessary and inefficient.

Sincerely,

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Stakeholder Comment Matrix – October 8, 2019
Request for input on market power mitigation



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|--|----------------------------|
| Period of Comment: October 8, 2019 through October 29, 2019 | Contact: [REDACTED] |
| Comments From: Heartland Generation Ltd. | Phone: [REDACTED] |
| Date: [2019/10/29] | Email: [REDACTED] |

The AESO is seeking comments from stakeholders on market power and market power mitigation in Alberta's energy and ancillary services markets.

| | Questions | Stakeholder Comments |
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| 1. | <p>What has been effective in Alberta's historical approach to market power mitigation in the energy-only market, and what could be improved?</p> | <p>Heartland Generation Ltd. (HGL) believes that Alberta's overall wholesale electricity market design has delivered adequate capacity at reasonable cost and has been effectively competitive. This has been exemplified by the market attracting approximately 10 GW (~\$17B) of installed capacity since 2000 without sustained periods of high prices.^{1,2}</p> <p>In Alberta Utilities Commission (AUC) Proceeding 3110, Dr. Jeffrey Church explains that "the competitiveness of a market is assessed by considering the extent to which firms can exercise market power," which is defined as "the ability of a firm to profitably raise price above competitive levels."³ With respect to this benchmark "competitive level," Dr. Church explains that "[e]conomists typically define market power as the ability to profitably raise price above marginal cost, the price that would prevail in perfectly competitive markets."⁴</p> <p>Since the perfectly competitive market outcome maximizes total surplus, it makes sense that it would be the benchmark with which to evaluate market outcomes. However, its real-world usefulness is limited by the fact that perfectly competitive markets do not exist, and firms in real-world, imperfectly competitive markets must raise price above marginal cost to recover their fixed production costs. As explained by Dr. Church:</p> <p style="padding-left: 40px;">However, the definition [of market power] used by economists is less useful for policy analysis since many firms will be able to exercise market power based on this definition—indeed any firm whose demand curve is downward sloping—but they will not be able to raise price above average cost levels, i.e., earn greater than a competitive return. Indeed, if a firm's unit cost declines as it expands output, the firm will have to be able to profitably raise price above marginal cost in order to break even.⁵</p> <p>Consequently, when evaluating imperfectly competitive markets we must recognize that "[t]he ability to raise prices over competitive levels implies the ability to raise prices above average cost, a level that reflects the requirement of</p> |

¹ Alberta Utilities Commission, "Installed Capacity," <http://www.auc.ab.ca/pages/annual-electricity-data.aspx>.

² Independent Power Producers Society of Alberta, <http://ippsa.com/>.

³ Exhibit 0014.06.MSA1-3110, Dr. Jeffrey Church, "The Competitive Effects of TransAlta's Timing of Discretionary Outages," March 18, 2014, page 14 (pdf), para. 32.

⁴ Ibid., page 14 (pdf), footnote 10.

⁵ Ibid.

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| | <p>firms to break even and is a useful definition of a competitive market even when firms are not perfectly competitive.”⁶ By extension, if we adopt the economic definition of market power, we must “distinguish between the inefficient and efficient exercise of market power,” since “<u>only the exercise of market power that raises the price above long run average cost levels is inefficient.</u>”⁷ [emphasis added]</p> <p>It is important to recognize that this is not just academic hairsplitting – it is both the philosophical and economic bedrock upon which our wholesale electricity market has been built. In 2011, the Market Surveillance Administrator (MSA) made this clear by issuing the <i>Offer Behaviour Enforcement Guidelines</i> (OBEG), which elucidated the fundamental trade-off between static and dynamic efficiency. As the MSA explained in its 2012 State of the Market Report (“the Report”):</p> <p style="padding-left: 40px;">When evaluating the performance of market [sic] in the short-run, productive and allocative efficiencies are the conventional measures of static economic efficiency employed by economists. The term ‘static’ denotes a measure taken at one point in time with the prices of all other goods and services taken as fixed. Static efficiency is a useful indicator but not a single or all-encompassing measure of economic efficiency. As stated in the MSA’s <i>Offer Behaviour Enforcement Guidelines</i> many economists view the true benefit of competition as being to spur dynamic efficiency gains that can outweigh static efficiency losses but require a longer term perspective. Dynamic efficiency recognizes that over time there is the ability to innovate and invest leading to superior allocative and productive outcomes.⁸</p> <p>Specifically, this trade-off involves generators raising price above marginal cost in the short-run to recover their fixed costs over the long-run:</p> <p style="padding-left: 40px;">... in a high fixed cost industry such as electricity generation, where revenue is obtained only from sales into the wholesale market (Alberta’s energy-only market) it is not appropriate that firms be expected (or required) to price at their marginal cost because they will not be able to cover their fixed costs, make a</p> |
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⁶ Ibid.

⁷ Ibid.

⁸ MSA, December 10, 2012, “State of the Market Report 2012: An Assessment of Structure, Conduct, and Performance of Alberta’s wholesale electricity market,” pages 11 and 12 (pdf). Accessed at: <https://resources.albertamsa.ca/uploads/pdf/Archive/2012/SOTM%20Final%20Report%2020130104.pdf>

normal return and afford to reinvest in the market (or attract other investors to the market because of the stable revenue platform).⁹

Dr. Church affirms this rationale and directly relates it back to the economic definition of market power as follows:

Because of the fixed costs associated with generation, it is well understood that in order for some generators, in particular marginal generators to break even, the price in the market will have to exceed their short run marginal cost and equal their average cost. That is, some exercise of market power is likely to be efficient and require economic withholding to be realized. There is an efficient level of economic withholding in the supply of electricity in Alberta.¹⁰ [emphasis added]

So, if market power is defined as “raising price above marginal cost in the short-run,” then “[i]n the MSA’s view this meant short run inefficiencies from the exercise of market power were necessary so that generators can earn competitive rates of return.”¹¹ The following excerpt provides the MSA’s view in 2012 that the trade-off had been worthwhile:

The findings are startling: total static efficiency losses were less than 1 percent of the average wholesale market price over the period measured, 2008-2011. The MSA regards this magnitude as insignificant, and easily outweighed by dynamic efficiency gains. On that front, the record is that since deregulation in 2000 over 6,800 MW of new capacity has been developed and 1,400 MW of inefficient capacity has been retired - this in a market with a peak demand in the order of 10,000 MW. Sixty percent of the new capacity has come from cogeneration facilities that take advantage of production economies of scope. The addition of over 1,000 MW of wind generation is also significant.¹² [emphasis added]

The Report then articulated the standard for “effective competition” as being “over the medium term the market delivers a wholesale price of electricity that is no higher than necessary to secure the reliable supply of electricity to consumers now and in the future.”¹³ This standard is based on the “economic concept of the long run marginal

⁹ Ibid., page 12 (pdf).

¹⁰ Dr. Jeffrey Church, “Revocation of the Offer Behaviour Enforcement Guidelines,” May 8, 2017, page 7 (pdf), para. 8: <https://resources.albertamsa.ca/uploads/pdf/Archive/00000-2017/2017-05-09%20IPPSA%20Comments%20and%20Paper.pdf>

¹¹ Ibid., page 13 (pdf), para. 17.

¹² Alberta MSA, “State of the Market 2012,” page 12 (pdf).

¹³ Ibid., pages 12 and 13 (pdf).

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| | <p>costs of investment (LRMC),” such that “at any given point in time prices may be higher or lower than the LRMC but a well-functioning market should not see that persist over time.”¹⁴ Simply, if the price is above the LRMC for an extended period, then “investment of some type should occur;” by extension, the “absence of that investment would suggest a problem, for example barriers of entry.”¹⁵ The Report concluded, and it is still relevant today, “<u>the record of investment in the market over the last dozen years and the absence of sustained periods of high prices over the period are indicative that this standard has been met.</u>”¹⁶ [emphasis added]</p> <p>The Report’s analysis showed that Alberta’s energy-only market was “effectively competitive,” with no need for additional market power mitigation. In 2017, Dr. Church repeated this analysis and concluded that “[t]he data on prices and the relationship between supply and demand (investment) confirm that the MSA’s 2012 assessment that electricity in Alberta was effectively competitive is still appropriate in 2017.”¹⁷ The Alberta Electric System Operator (AESO) echoed this view in its recent Capacity Market application, saying:</p> <p style="padding-left: 40px;">To date, the EOM in Alberta has resulted in a sufficient supply of electricity at competitive prices. It is often the case that electricity market participants submit offers below their marginal costs in order to ensure dispatch. <u>Although an EOM design which allows offers above marginal costs results in a small loss of static efficiency, it has nonetheless been offset by significant private investment in Alberta’s generation capacity.</u>¹⁸ [emphasis added]</p> <p>HGL agrees that historical market outcomes do not suggest an inefficient level of market power. This seems logically consistent with historical average prices over both the long and short-run: in 2018 the average Pool price increased from the historic lows of 2015 to 2017 but was still barely above the long-term average price of \$49.32 per MWh. The average on-peak price similarly rose to \$59.50/MWh but stayed below its long-run average of \$62 per MWh:¹⁹</p> |
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¹⁴ Ibid., page 12 (pdf).

¹⁵ Ibid., page 75 (pdf).

¹⁶ Ibid.

¹⁷ Dr. Jeffrey Church, “Revocation of the Offer Behaviour Enforcement Guidelines,” page 16 (pdf), para. 30.

¹⁸ 23757-X0284, AESO, “Application for Approval of Capacity Market Rules,” page 130 (pdf), para. 552.

¹⁹ AESO, 2018 Annual Market Statistics data file, published on June 24, 2019.

| Year | Average hourly Pool price | On-peak average Pool price |
|----------------|----------------------------------|-----------------------------------|
| 2009 | \$ 47.81 | \$ 58.04 |
| 2010 | \$ 50.88 | \$ 62.99 |
| 2011 | \$ 76.22 | \$ 102.22 |
| 2012 | \$ 64.32 | \$ 84.72 |
| 2013 | \$ 80.19 | \$ 106.13 |
| 2014 | \$ 49.42 | \$ 61.48 |
| 2015 | \$ 33.34 | \$ 40.73 |
| 2016 | \$ 18.28 | \$ 19.73 |
| 2017 | \$ 22.19 | \$ 24.46 |
| 2018 | \$ 50.50 | \$ 59.50 |
| AVERAGE | \$ 49.32 | \$ 62.00 |

These average prices, both recent and long-run, have barely exceeded the levelized cost of energy (LCOE) for inframarginal generators, let alone marginal ones.²⁰ This is instructive because, as explained by the MSA, the levelized cost “provides a useful proxy of LRMIC,”²¹ and the comparison between historical average prices and the LCOE suggests that the exercise of market power has not consistently raised price above break-even levels or compromised dynamic efficiency and the competitiveness of the market.

HGL is not aware of any evidence to contradict the above conclusions of the MSA, Dr. Church, and the AESO that Alberta’s energy-only market has been competitive. The economic rationale and evidence presented thus far leads to the conclusion that, if you define market power as raising price above marginal cost in the short run, then some market power has existed, but it has not been excessive (i.e. inefficient). Therefore, HGL submits that there has not been any market power induced market failure and Alberta’s energy-only market has been effectively competitive.

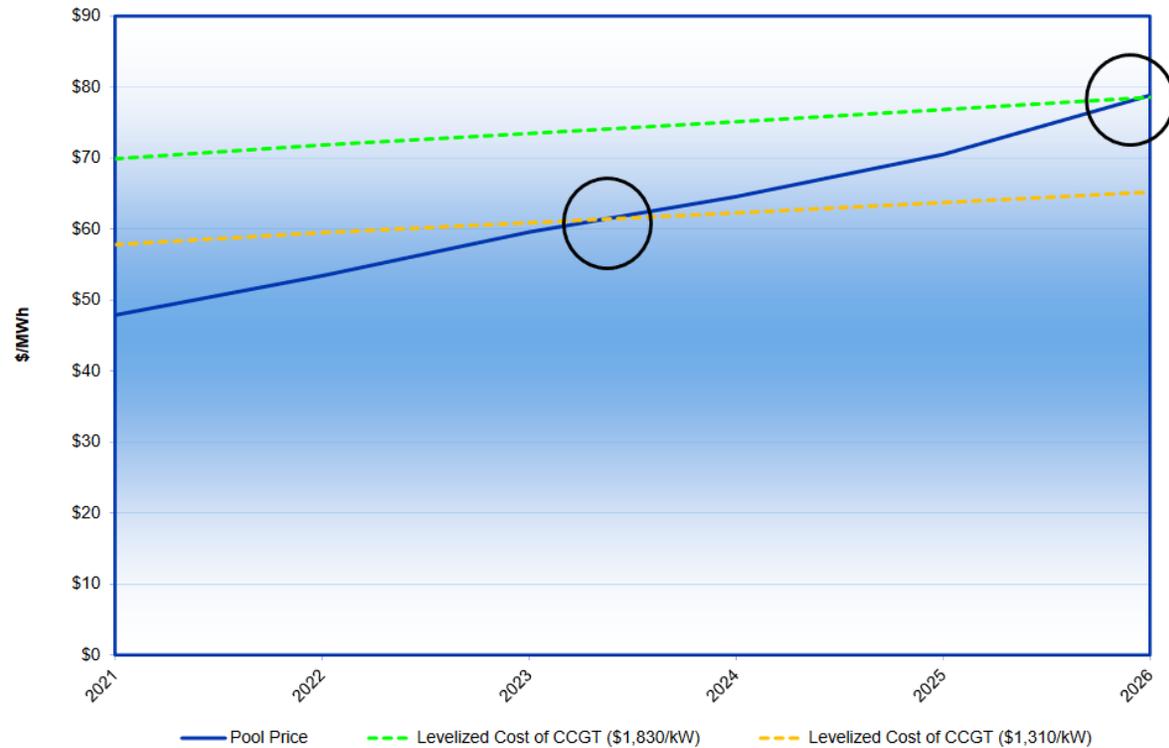
²⁰ The LCOE is the “average cost per megawatt hour of energy to recover all capital and operating costs, including a specified rate of return, over the entire life of a power generation project.” See AESO, 2019 Long-Term Outlook, page 54 where average cost of combined cycle technology is at \$55/MWh and average cost of simple cycle technology is at \$114/MWh.

²¹ Alberta MSA, “State of the Market 2012,” page 75 (pdf).

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| 2. | <p>Do you expect the historical approach to market power mitigation in the energy-only market (e.g. OBEG, ex-post monitoring, must offer, 30% offer control limit, FEOC Regulation) will be effective on a go-forward basis?</p> <p>If yes, please explain your rationale. If no, please explain your rationale and changes required.</p> | <p>HGL firmly believes that Alberta’s energy-only market will continue to provide adequate reliability at reasonable cost and remain effectively competitive.</p> <p>The recent capacity market proceeding provided an abundance of theoretical and empirical evidence relating to market design and the Alberta energy-only market in particular. Specifically, rigorous analysis was presented with respect to forecasting both future resource adequacy and its cost. Among the most compelling analysis indicated that the capacity market was not needed at the time because of the energy-only market’s continued ability to provide adequate capacity at reasonable cost.</p> <p>For example, consider the evidence of EDC Associates Ltd. (EDC) on behalf of the Consumers Coalition of Alberta, which forecasted both pool price and reliability under the current energy-only market design. With respect to the former, it forecast pool price between 2021 to 2026 and then compared this forecast to the levelized cost of combined-cycle generation, which it illustrated with the following figure:²²</p> |
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²² 23757-X0372, EDC Associates, “Capacity Market Quantitative Analytics for Proceeding #23757,” February 28, 2019, page 9 (pdf).

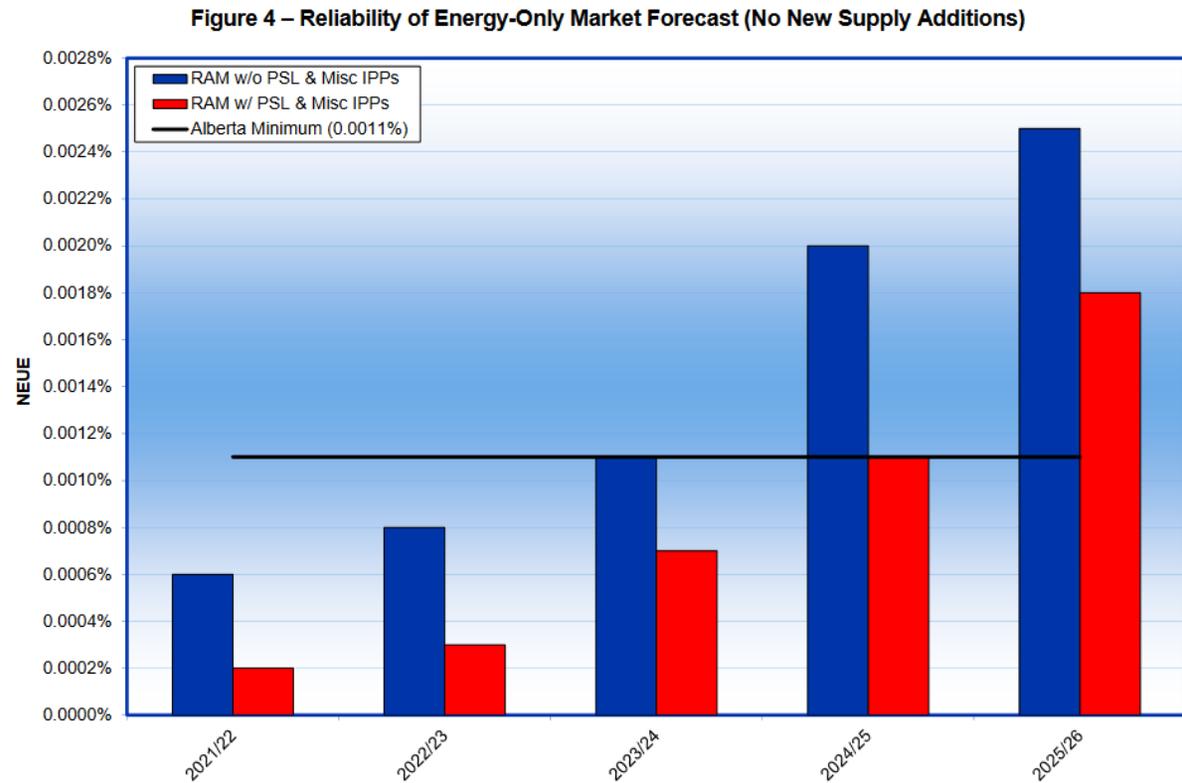
Figure 3 – Pool Price vs Levelized Cost of Combined-Cycle



Based on these results, EDC concluded that “the pool price forecast does not reach the levelized cost of combined-cycle (dashed lines) until the mid-to-late 2020s,” which “signifies that the introduction of the capacity market is perhaps too early” and that “the energy-only market is currently well enough supplied to continue to provide a low-cost to the consumer and sufficient reliability.”²³ Consistent with the economic rationale presented in response to question one of this submission, EDC’s analysis suggests that the exercise of market power will not consistently raise price above break-even levels or compromise dynamic efficiency and the competitiveness of the market.

²³ 23757-X0372, EDC Associates, “Capacity Market Quantitative Analytics for Proceeding #23757,” February 28, 2019, page 9 (pdf).

Despite this pool price forecast, EDC did not forecast a resulting lack of reliability. Instead, using an “overly pessimistic view of reliability under energy-only,” it forecast the normalized expected unserved energy (EUE) as being better than the Government’s standard of 0.0011% (which is already strict relative to the efficient level of reliability)^{24,25} until around 2025.²⁶ The figure below summarizes this result.²⁷



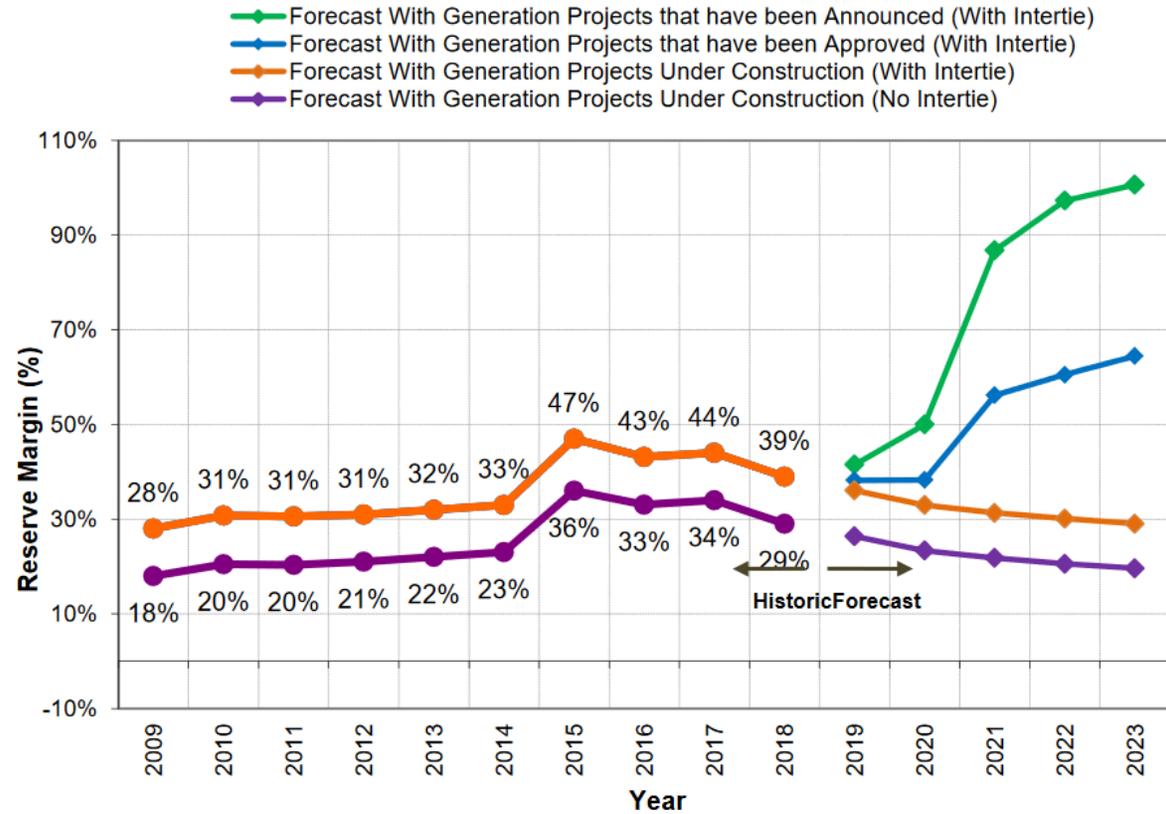
²⁴ See Brattle, “Resource Adequacy Requirements: Reliability and Economic Implications,” September 2013, page 85 (pdf).

²⁵ See 23757-X0342, Brattle, “Alberta’s Capacity Market Demand Curve,” January 2019, pages 5 and 6 (pdf).

²⁶ 23757-X0372, EDC Associates, “Capacity Market Quantitative Analytics for Proceeding #23757,” February 28, 2019, page 10 (pdf).

²⁷ Ibid.

This reliability forecast is consistent with the other more recent metrics published by the AESO. For example, in its most recent Long Term Adequacy report, the AESO forecast the reserve margin, assuming only existing and under construction projects out to 2023, as being lower than recent years but within range of the long-term historical average:²⁸



The supply cushion metric tells a similar story and the “two-year probability of supply adequacy shortfall” metric shows the EUE of 167 MWh being well below both: a) the AESO’s emergency threshold of 1,600 MWh, and b) the

²⁸ AESO, Long Term Adequacy Metrics, August 2019, page 15 (pdf).

| | | <p>“minimum resource adequacy standard of 0.0011% EUE (approximately 964 MWh at the load level anticipated in 2022):”^{29,30}</p> <table border="1" data-bbox="705 354 1900 495"> <thead> <tr> <th data-bbox="705 354 1113 427">Worst Shortfall Hour (MW)</th> <th data-bbox="1113 354 1430 427"># of Hours in Shortfall</th> <th data-bbox="1430 354 1900 427">Total Energy Not Served (MWh)</th> </tr> </thead> <tbody> <tr> <td data-bbox="705 427 1113 495">68</td> <td data-bbox="1113 427 1430 495">1</td> <td data-bbox="1430 427 1900 495">167</td> </tr> </tbody> </table> <p data-bbox="718 509 1228 532"><i>Note: Values are rounded and represent average outputs</i></p> <p data-bbox="621 570 1990 740">Overall, this evidence suggests that the current energy-only market design will continue to meet the standard for effective competition set out by the MSA and others. The consensus outlook of reasonable prices and more than adequate capacity indicate that the exercise of market power will not be excessive, and that the market will deliver “a wholesale price of electricity that is no higher than necessary to secure the reliable supply of electricity to consumers...”³¹</p> | Worst Shortfall Hour (MW) | # of Hours in Shortfall | Total Energy Not Served (MWh) | 68 | 1 | 167 |
|---------------------------|---|--|---------------------------|-------------------------|-------------------------------|----|---|-----|
| Worst Shortfall Hour (MW) | # of Hours in Shortfall | Total Energy Not Served (MWh) | | | | | | |
| 68 | 1 | 167 | | | | | | |
| 3. | <p>If deemed that additional mitigation measures are required in the energy-only market, please indicate whether they should be applied ex-ante (mitigation occurs prior to prices being set) or ex-post (mitigation occurs following market prices being set).</p> | <p>As explained in response to questions one and two, HGL submits that additional market power mitigation measures are <u>not</u> required in the energy-only market.</p> <p>Instead, when forming its recommendations for the government, the AESO should consider the following:</p> <ol style="list-style-type: none"> <li data-bbox="667 922 1814 948">1) <u>Unilateral offer behavior should be unmitigated and enshrined in legislation or market rules.</u> <p data-bbox="718 976 1969 1105">Alberta’s current energy-only market design is predicated on achieving dynamic efficiency, such that generators exercise market power to recover fixed costs and are ultimately disciplined by competition. As demonstrated in response to questions one and two, this market design has been and will continue to be successful.</p> <p data-bbox="718 1133 1934 1195">The paradigm of unmitigated offer behaviour was codified by the MSA’s OBEG, which proved to be impermanent and subject to inconsistent decision-making as the office-holder of the MSA changed. As</p> | | | | | | |

²⁹ Ibid., page 18 (pdf).

³⁰ 23757-X0341, Brattle, “Alberta’s Capacity Market Demand Curve,” page 13 (pdf).

³¹ Alberta MSA, “State of the Market 2012,” page 4 (pdf).

explained by Dr. Church, the continued lack of offer behaviour guidelines constitutes “regulatory hold-up” and is damaging to the market.³² Such a fundamental component of Alberta’s energy-only market design should be permanently codified by the government in legislation or regulation.

2) Continued ex-post mitigation should focus on conduct that creates, enhances, or maintains market power.

Economic withholding is an essential feature to the functioning of the current electricity market design. Instead of focusing mitigation efforts on the efficient exercise of market power, resources would be better used on addressing conduct that compromises the efficiency of market outcomes. As explained by Dr. Church, this is conduct that “reduces the extent to which a firm or supplier’s customers are willing, or able, to substitute to other products (away from electricity) or the extent to which their demand can be met by increased production of electricity by other suppliers.”³³

In the context of the energy-only market, it is this conduct that creates, enhances, or maintains market power that is the issue, not the unilateral exercise of market power itself. As further explained by Dr. Church in Proceeding 3110:

Consistent with the distinction between the exercise of market power and conduct that creates, enhances, or maintains market power found in the economic and competition policy literature, the concern with anticompetitive conduct and negative effects on competition of Section 6 and the FEOC Regulation would be that electricity suppliers not engage in conduct that creates, enhances, or maintains market power. It is behaviour that has this effect on market power that is typically considered to be anticompetitive. It negatively affects the competitive process by reducing the competitive constraint on firms. From this perspective, the concern of Section 6 and the FEOC Regulation should not be with the exercise of market power, i.e., the effectiveness of economic withholding alone.³⁴ [emphasis added]

3) Additional ex-ante mitigation is difficult to administer and not worthwhile.

During the recent capacity market proceeding, the current MSA proposed that, rather than implement a

³² Dr. Jeffrey Church, “Revocation of the Offer Behaviour Enforcement Guidelines,” pages 7 to 9 (pdf).

³³ Exhibit 0014.06.MSA1-3110, Dr. Jeffrey Church, “The Competitive Effects of TransAlta’s Timing of Discretionary Outages,” March 18, 2014, page 14 (pdf), para. 32.

³³ Ibid., page 7 (pdf), para. 10.

³⁴ Ibid., page 14 (pdf), para. 32.

capacity market, the energy-only market should be redesigned. Instead of relying on market power for price formation and cost-recovery, it argued that the new market design should be based on administrative ex-ante offer mitigation and shortage pricing, similar to US markets like ERCOT.³⁵ HGL submits that such an administrative market design is unwarranted for the following reasons:

- a. The efficiency losses caused by economic withholding under our current market design are small. For example, in the Report, the MSA calculated static efficiency losses from economic withholding as being “small in comparison to overall pool price,”³⁶ and in its recent capacity market application the AESO similarly characterized the static efficiency losses under our current energy-only market design as being “small.”³⁷
- b. Implementing an administrative market design, like the one proposed by the MSA, would be burdensome, costly, and prone to error. For evidence of the logistics involved in creating such a market, one must look no further than ERCOT, an energy-only market like Alberta’s that has implemented ex-ante offer mitigation in conjunction with an Operating Reserve Demand Curve (ORDC).³⁸ This mechanism of shortage pricing and offer mitigation is extremely complex, subject to innumerable assumptions about the supply and demand of electricity, value of lost load, and probability of supply shortfall. These assumptions and others make it prone to frequent and potentially extensive regulatory intervention.³⁹
- c. Price formation under our current market-design is strongly correlated with scarcity, and thus administrative shortage pricing is unlikely to materially improve the “price signal.” For example, the following figure shows the strong relationship between supply cushion and marginal offers over 2018:

³⁵ 23757-X0787.01, “Final Argument of the MSA,” page 43 (pdf), para. 147.

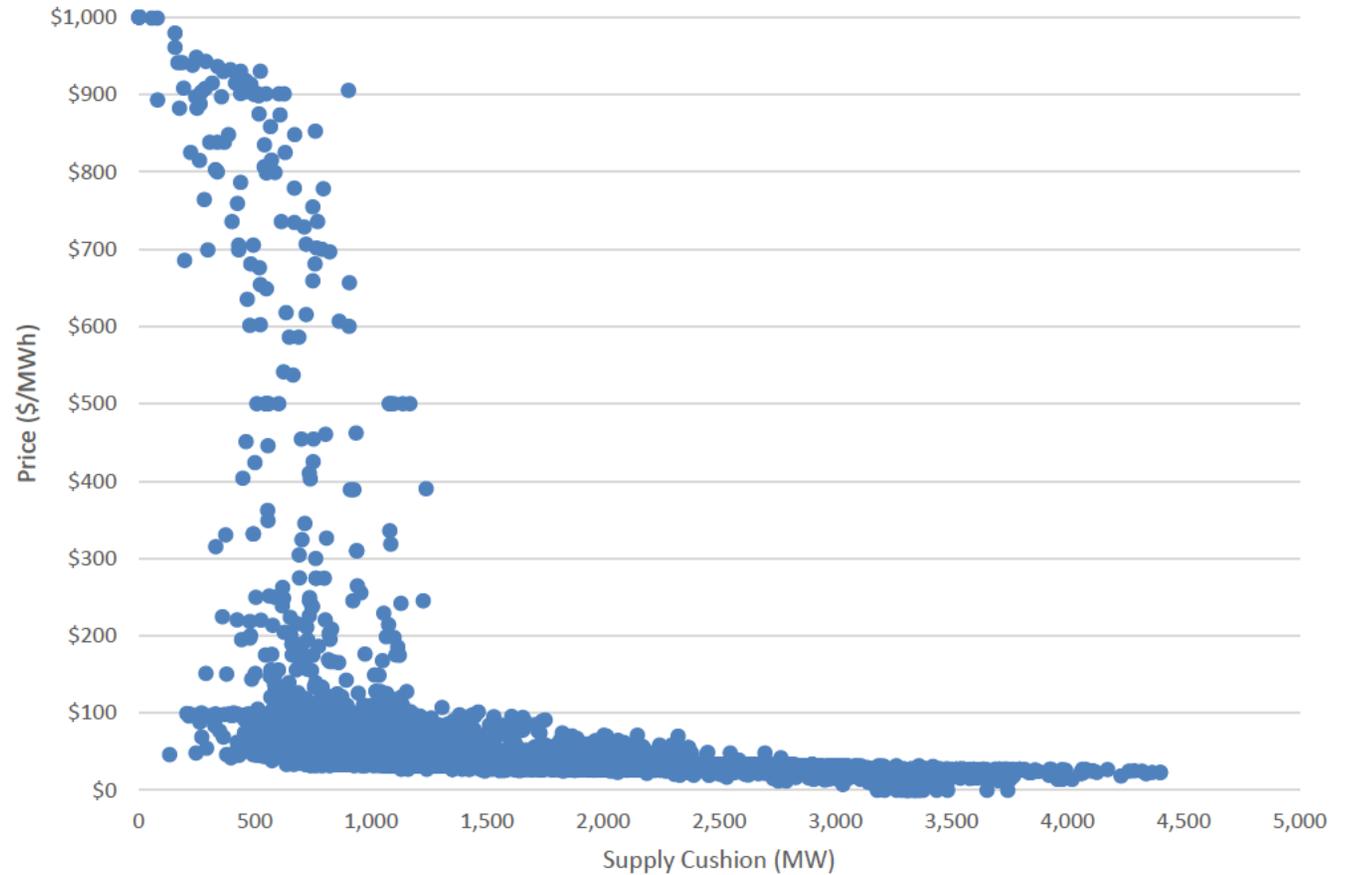
³⁶ Alberta MSA, “State of the Market 2012,” page 73 (pdf).

³⁷ As previously confirmed by the MSA, AESO, and others including in 23757-X0284, AESO, “Application for Approval of Capacity Market Rules,” page 130 (pdf), para. 552.

³⁸ 23757-X0787.01, “Final Argument of the MSA,” page 34 (pdf), para. 121.

³⁹ <https://www.utilitydive.com/news/ercots-reliability-anxiety-energy-groups-square-off-on-whats-to-blame/553608/>

Supply Cushion vs. Marginal Offers, 2018



- d. Moving toward an ex-ante market power mitigation will require broader and more involved consultation and review with stakeholders. Market power and price formation/signaling are intrinsically linked to almost every design aspect of participation in the wholesale electricity market. A drastic change to the market power mitigation, like the MSA proposed during the capacity

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| | | <p>market, will necessitate further discussion, at a minimum on price formation and market efficiency. Ex-ante mitigation cannot be examined in silo and would be more akin to market redesign.</p> <p>In conclusion, the current energy-only market has been and will continue to be competitive and provide adequate capacity at reasonable cost. Given the foregoing, HGL agrees with the conclusion espoused in the Report that there is little to be gained from changing the status quo to an alternative market design:</p> <p>... different electricity markets tackle the problem of transferring enough to cover fixed costs in different ways. [footnote omitted] Some restrict generator offers through mitigation schemes but transfer the additional amounts through capacity markets. Alberta’s energy-only market relies on all of the required transfer coming through the price of energy. <u>Low static efficiency losses in the Alberta market imply that the transfer is efficient and as consequence alternative market designs are unlikely to be better and quite possibly worse.</u>⁴⁰ [emphasis added]</p> <p>This view is consistent with that of Dr. Church, who also questioned the benefits of mitigating market power in Alberta’s energy-only market:</p> <p>Supply of electricity in Alberta is currently characterized by historically low prices and large reserve margins. <u>It seems very unlikely that the benefits from controlling inefficient economic withholding even if it can be successfully identified and controlled will be material.</u> The MSA has not explained why the low prices and excess capacity that characterize the market in 2017 will not persist until the introduction of capacity markets.⁴¹ [emphasis added]</p> |
| 4. | <p>What has been effective in Alberta’s historical approach to market power mitigation in the operating reserves market, and what could be improved?</p> | <p>The operating reserves market is competitive and does not require any further market power mitigation to address inefficiency.</p> <p>There is ample supply capacity offered into the operating reserves market for all products. From 2014 to 2018, the amount of available capacity was 67% to 332% above the volume that was procured by the AESO across all operating reserves products.⁴² This is evidence that the operating reserves market is competitive; with more suppliers offering than will be procured, suppliers must compete to offer services or else forego ancillary services revenue. Further to this analysis, the combined MWs offered for each operating reserves product minus the largest</p> |

⁴⁰ Alberta MSA, “State of the Market 2012,” page 73 (pdf).

⁴¹ Dr. Jeffrey Church, “Revocation of the Offer Behaviour Enforcement Guidelines,” page 9 (pdf).

⁴² Exhibit 23757-X0501, Rebuttal Evidence of TransAlta provided by London Economics, “Does Alberta require additional mitigation protocols for non-thermal storage resources and separate market power mitigation frameworks for operating reserves and the energy market?” page 17 (pdf).

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| | <p>combined offer for that product, are sufficient to meet the highest level of operating reserves products demanded; this means that the largest participant is not pivotal in the active operating reserves market.⁴³ To say this another way, if the largest market participant was removed, the operating reserves market for each product would still have sufficient supply offered to clear demand for each product. Theoretically, as proposed by Charles River Associates, “if ancillary services markets receive offers from large quantities of supply – available from a diversity of resources – in comparison to the demand for services, the market is likely unconcentrated and the exercise of market power is less likely.”⁴⁴ This suggests that market power is not excessive in the operating reserves market; therefore, further mitigation, or a change in mitigation, is not warranted.</p> <p>The AESO seemed to agree that the economic withholding observed in the ancillary services market is not an excessive use of market power: When asked whether pricing up energy offers to manage fuel constraints would be considered economic withholding, the AESO responded, “So technically it is economic withholding, but it’s not market power.”⁴⁵ HGL understands the AESO’s differentiation here to mean that an exercise of market power to increase price would not <i>prima facie</i> be considered excessive market power.</p> <p>The operating reserves market currently has three main ways of mitigating market power:</p> <ol style="list-style-type: none"> 1. <u>Ex-post review of market conduct.</u> The conduct of market participants in the operating reserves market, just as in the energy market, is subject to ex-post review. The focus is to maintain the FEOC operation of the market and prevent any conduct that creates, enhances, or maintains excessive market power. The investigation and enforcement functions of various agencies are necessary for the efficiency of a competitive market. 2. <u>Maximum size of combined non-hydro offers.</u> Unless an exemption is granted, the maximum size of combined offers from a single non-hydro unit is capped at 80 MW. This serves to limit the impact from any single asset in the operating reserves market. Subsequently, this maximum size limit promotes participation from a diversity of units offering into the operating reserves market. |
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⁴³ Ibid., pages 17-18.

⁴⁴ Hunger, David et al. Charles River Associates, June 13, 2018, “Assessment of Market Power Mitigation Measures in Alberta’s CMD2 Reform,” page 45 (pdf). Accessed at: https://resources.albertamsa.ca/uploads/pdf/Archive/000000-2018/Aberta%20MSA_CMD2%20Market%20Power%20Assessment_CRA%2006-13-2018_Final.pdf

⁴⁵ Capacity Market Hearing, AUC Proceeding 23757, Transcript Volume 6, page 841 line 23 to page 842 line 7, April 7, 2019.

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| | | <p>3. <u>Clearing price capped by the AESO.</u></p> <p>The clearing price in the active operating reserves market is effectively capped by the bid price of the AESO. This has historically been set at less than or equal to a \$100/MWh premium over the energy pool price. This structural clearing price cap limits the exercise of market power by operating reserves providers; however, it potentially allows the AESO, as the single buyer of operating reserves, to exercise monopsonic market power by maintaining the cap below the competitive level and in turn extracting undue rents from operating reserve suppliers.</p> |
| 5. | <p>Do you expect the historical approach to market power mitigation in the operating reserves market (e.g. FEOC regulation, indexed to pool price) will be effective on a go-forward basis?</p> <p>If yes, please explain your rationale. If no, please explain your rationale and changes required.</p> | <p>HGL submits that the current approach to market power mitigation in the operating reserves market is not anticipated to require changes.</p> <p>As explained above, the historic approach to market power mitigation is well-suited to the operating reserves market, and there is no evidence that its competitiveness will be compromised in the future. The AESO seemed to agree during the capacity market proceeding, stating there were “no pressing concerns with the current separate operating reserves market.”⁴⁶ HGL agrees that the current separate market is efficient, and that changing the market construct could have unintended consequences while also incurring costs of implementation and consultation. The AESO further justified leaving the operating reserves market unaltered by stating, “the ancillary services market is successful at identifying security signals and partial optimization is already occurring through indexed pricing.”⁴⁷</p> |
| 6. | <p>If deemed that additional mitigation measures are required in the operating reserves market, please indicate whether they should be applied ex-ante (mitigation occurs prior to prices being set)</p> | <p>As explained in response to questions four and five, HGL submits additional mitigation measures are <u>not</u> required in the operating reserves market.</p> <p>However, some parties may think otherwise and suggest that co-optimization between the energy and operating reserves markets should be implemented. It is unclear if this would be considered as an ex-ante or ex-post mitigation approach as it would subsume the operating reserves market under all market power mitigation measures present in the energy market. It is worth noting that during the capacity market consultation the AESO</p> |

⁴⁶ Exhibit 23757-X0795, “AESO Written Argument,” page 307 (pdf), para 818.

⁴⁷ Ibid., page 308 (pdf), para 821.

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| <p>or ex-post (mitigation occurs following market prices being set).</p> | <p>indicated that “the efficiency gain in relation to moving from the current separate markets to co-optimized markets was small.”⁴⁸ Provided as rationale for this determination, “the AESO’s analysis showed marginal benefits from co-optimization (which are likely less than the implementation costs).”⁴⁹</p> <p>HGL agrees. Any market structure change needs to have its costs of implementation and maintenance weighed against the expected benefit of those changes. HGL does not believe a change to another design, for example co-optimization, is necessary or beneficial because it has not been shown that there is a market failure caused by market power, or otherwise, in the operating reserves market; the benefit of implementing the alleged solution has not been shown to exceed the cost of the problem, if there even is a problem.</p> <p>To put it plainly, Alberta does not have the problems that other markets face, which would justify changing the operating reserves market. The value of market power mitigation through co-optimization would “increase if there were security issues, insufficient liquidity in the ancillary services markets, or inefficient dispatch.”⁵⁰ These problems are not observed in the Alberta context, and are not foreseeable to occur. Proponents of change may advocate that the termination of the Hydro PPAs at the end of 2020 will alter liquidity in the ancillary services market and likewise increase significantly the value of co-optimization.⁵¹ It is not clear what effect the termination of the Hydro PPAs will have on liquidity in the ancillary services market. HGL submits that the removal of the required participation of such a large ancillary service provider may increase liquidity as other participants rush to the operating reserves market to compete. It is putting the cart before the horse to assume that the termination of the Hydro PPA will have an adverse impact on the ancillary services market.</p> <p>If further market power mitigation is employed, there is a risk of over-mitigation that can cause a negative impact on system reliability.⁵² With hydro storage assets, for example, over-mitigation could cause the inefficient use of water, such that an asset is unable to sufficiently store water when it is operationally sound for it to do so. Further, and no longer specific to hydro storage assets, over-mitigation causes inefficient business decisions on behalf of all operating reserves providers. Two examples of these inefficient business decisions are operating reserves providers</p> |
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⁴⁸ AESO, *Comprehensive Market Design 4.0 Section 10*, “Roadmap for Changes in the Energy and Ancillary Services Markets,” page 11 (pdf).

⁴⁹ *Ibid.*, page 34 (pdf).

⁵⁰ Exhibit 23757-X0795, “AESO Written Argument,” page 308 (pdf), para 822.

⁵¹ Exhibit 23757-X0815, “Reply Argument of ADC and IPCAA,” page 8 (pdf), para 14.

⁵² Exhibit 23757-X0501, “Rebuttal Evidence of TransAlta provided by London Economics,” *Does Alberta require additional mitigation protocols for non-thermal storage resources and separate market power mitigation frameworks for operating reserves and the energy market?* page 20 (pdf).

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| | | <p>will leave the voluntary market due to deflated value and revenues, and operating reserves providers will defer otherwise efficient capital investments that would enhance the flexible characteristics of those generators.⁵³ Implementing any further changes to the market power mitigation framework in the operating reserves market increases the risk of over-mitigation, leading to inefficient investment decisions and an increased risk of a negative impact to system reliability.</p> |
| 7. | <p>What criteria should be considered in evaluating Alberta’s mitigation framework? Would you rank one or some of these criteria more highly than others?</p> | <p>HGL believes that the criteria to evaluate the market should be contextual and not a bright-line or threshold test, which would be included in the market rules or regulations.</p> <p>The policy and regulations already include broad market objectives, like the FEOC Regulation; the objective in the FEOC Regulation is simply to ensure the fair, efficient, and openly competitive operation of the market. These are the policy criteria by which the structural components of the market should be evaluated.</p> <p>The Report provides the following insight:</p> <p style="padding-left: 40px;">Part of our test for <i>effective competition</i> was to ensure that price outcomes over the medium term are no higher than they need to be to ensure the market is sustainable (new investment occurs when it is profitable). That means we do not expect that price will equal LRMC in every hour. Rather, this is a relationship that is expected to hold on average over lengthy periods of time. While generation projects must be economic over much longer periods the MSA believes the market must demonstrate <i>effective competition</i> over a shorter timeframe. The MSA believes the comparison over a five-year window appropriately balances the two;⁵⁴</p> <p>The focus needs to be on creating the market structure, and the evaluation mechanism is only to check the overall health of the market. There should not be an administrated test of outcomes of the market; this would increase the temptation to change the market in order to force certain outcomes. For example, the following sequence is likely to occur if change to accommodate price/market outcomes are employed: Ex ante market power mitigation is implemented, which leads to an overall chill in investment. Revenue insufficiency and decreasing reserve margins requires changes to price formation such as implementing an operating reserve demand curve (ORDC). Continuous changes and administrative actions to align incentives and market fundamentals are required to create a market which attracts the correct level of investment. Additional market changes and administration unnecessarily adds complexity and inefficiency to an already competitive and well-functioning market.</p> |

⁵³ Ibid., page 20-21 (pdf).

⁵⁴ MSA, “State of the Market Report,” page 76 (pdf).

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| | | <p>There is also an asymmetrical risk on when changes would be implemented. For example, if long-run marginal cost (LRMC), levelized cost (LEOC), or some other cost benchmark was chosen as the bright line test, policy makers would be more likely to treat it as a price maximum rather than as a benchmark to be met over the long-term. While policy makers would be slow to intervene during periods of sustained price below the benchmark, they would be quicker to intervene if price in a single year is above it. Therefore, it is preferable to remove the temptation of direct regulatory intervention in the market by holistically assessing the health of the market over the medium to long-term rather than directly evaluating short-term market outcomes against a prescribed benchmark. The emphasis should be on the FEOC operation of the market, which will result in competitive outcomes, long-term investment, and continued reasonable cost of electricity for consumers, without the regulatory burden from an administrated market solution.</p> |
| 8. | <p>Are there unique characteristics of Alberta's electricity market that may impact whether the market power mitigation approaches used in other jurisdictions are suitable for Alberta? If so, please describe them.</p> | <p>Alberta is a small market and shares little in common with the more mitigated, administrative market designs of United States jurisdictions.</p> <p>Alberta does not have the same overall market design of other jurisdictions. This is an obvious difference to see as most of the US jurisdictions employ a capacity market to differing extents, whereas Alberta has notably decided not to employ a similar design here; choosing the market power mitigation framework from a capacity market presents a persistent problem that would fail to make suppliers of electricity in Alberta whole (the missing money problem). Even ERCOT, touted as the only other energy-only market in North America like Alberta, has multiple distinct characteristics that would make employing a design aspect, i.e. market power mitigation, problematic without also including a plethora of other changes to the overall market design.</p> <p>ERCOT, to name a few design elements, has an operating reserve demand curve and adders, locational marginal pricing, security constrained economic dispatch (made necessary by allowable levels of congestion), and a day-ahead market. Therefore, the way in which ERCOT addresses market power is contingent on the operation and existence of these other elements in their market. Alberta would have to make sweeping changes to its market design to incorporate market power mitigation solutions from another market, some of which would not be able to exist without legislative changes; alternatively, Alberta would struggle or have the inability to recover fixed costs of generation and market redesign would become necessary due to the original changes to market power mitigation in isolation.</p> <p>In addition, Alberta is a small market, which means that there are much lower economies of scale when it comes to market design (i.e. the regulatory burden is spread over a much smaller market). Therefore, the average cost of any market redesign we undertake here is much higher than it is in larger US markets and this is arguably one reason why a more “free market” approach to market design in Alberta is sensible.</p> |

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| | | In summary, solutions from other markets/jurisdictions are solutions that were designed to be employed in that specific function and context. Market power mitigation and allowable offer behavior is an integral part to any functioning wholesale market and the solutions from one market invite the possibility of very real unintended consequences solely because the remaining market design in Alberta is unchanged. |
| 9. | What do you think the appropriate role for the AESO is in Alberta’s mitigation framework? | <p>HGL’s position is that there are necessary functions to be performed by the governmental agencies of Alberta, including those appropriate to the roles of the AESO and the MSA.</p> <p>The determination and division of these roles is contained within the relevant governing legislations. HGL does not comment directly on which agency should perform which functions relating to Alberta’s mitigation framework, only that the following functions are vital to the wholesale electricity generation market. HGL refers to the appropriate agency as simply “the agency” and does not take a position on whether the agency for each specific function is the MSA or the AESO as the roles of Alberta’s electricity agencies is under review.⁵⁵</p> <ol style="list-style-type: none"> 1. <u>Surveillance of conduct that creates, enhances, or maintains market power.</u> An important facet of any efficient market is the defense from anti-competitive conduct by participants. The agency should monitor the conduct of the market participants to ensure that it is consistent with the relevant legislation and does not undermine competitive forces. As HGL has stated previously, the excessive use of market power and conduct which creates, enhances, or maintains market power are separate and distinct concerns; the unilateral exercise of market power, exhibited in economic withholding or portfolio bidding behavior, is not inconsistent with the FEOC operation of the market. 2. <u>Publication of data/reports to promote transparency.</u> Competition is aided by transparency of information. Effective dissemination of information can support competition, as stated by Dr. Church, “Institutions or market structure elements, such as the HTR, which reduce uncertainty, increase the probability of not being dispatched, where it matters, when offers exceed those of rivals, and hence increase residual demand elasticities and decrease market power.”⁵⁶ The publication of data and reports in a timely and useful manner facilitates informed competitive bidding for |
| 10. | What do you think the appropriate role for the MSA is in Alberta’s mitigation framework? | |

⁵⁵ In a letter addressed to the AESO from the Minister of Energy, Sonya Savage, on July 25, 2019 it was stated: “During the consultations, I heard concerns about a **lack of clarity regarding mandates and roles of Alberta’s electricity agencies**. I have directed Alberta Energy to examine and propose options to address these concerns.” [Emphasis Added]

⁵⁶ Exhibit 21115-X0064, “The Competitive Effects of the Historical Trading Report: A Response to the MSA’s Application,” March 11, 2016, page 41 (pdf), para 71.

all market participants.

The agency should be empowered with the resources to effectively and efficiently produce reports and data. Information sharing/dissemination can play two very key roles in electricity markets: improving allocative efficiency by ensuring that scarce resources are consumed by those who value them most and allows companies to better understand market trends and experience, in order to better match supply with demand.⁵⁷ Alberta's electricity market hosts a diverse group of market participants including a high degree of cogeneration and potential price responsive load or demand response. Information sharing allows the diversity of market participants to incorporate as much relevant information as possible into their behaviour. Since there can be an asymmetry of information, inherent to an individual competitor's ability to forecast information/data not made public, every effort should be made to publish as much data by the agencies as possible in the public forum. The agency should therefore only withhold that information if it is specifically prevented from doing so due to confidentiality concerns or legislative prohibition.

3. Support market rules that sustain the fair, efficient, and openly competitive operation of the market.

The agency would need to have a role in developing market rules which address Alberta's market power mitigation framework. In this context "market rules" would not just be limited to the formalized ISO Rules, but also the publication of guidelines or other materials that inform market participants of acceptable behavior and practices. There are necessary structural components of a market which facilitate the mitigation framework. HGL continues to advocate for the current mitigation framework of the wholesale generation electricity market; this includes the ISO Rules, enforcement certainty, and agency alignment consistent with this market design. Any agency would necessarily need to cooperate with stakeholders to come to an understanding of the way the market behaves, and the appropriate role of all agencies and stakeholders in the mitigation framework. The economic efficiency of market design is undermined by uncertainty or inconsistency in agency behavior, or uncertainty surrounding agency jurisdiction.

Overall, an efficient market is one with clearly defined roles for the agencies and the wherewithal and support from agencies and stakeholders to allow the market to drive competitive outcomes. Any administrative interference has an associated inefficiency and needs to be weighed against the theoretical benefit or market failure it would be correcting. The regulator and agencies should be primarily concerned with maximizing long-run economic efficiency achieved through a market disciplined primarily by competitive forces rather than administrated solutions.

⁵⁷ Principles adapted from M. Bennett and P. Collins (2010), "The Law and Economics of Information Sharing: the Good, the Bad, and the Ugly," *European Competition Journal*, Volume 6, page 318. Accessed at: https://www.biicl.org/files/5151_infosharingpaper.pdf

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| | | Dr. Church has stated, “An advantage to society of an economic efficiency mandate is that a regulator can more readily resist demands that, in the short run, have immediate benefits for some, but in the long run destroy the incentive for investment and wealth creation.” ⁵⁸ |
| 11. | Please describe your role in the Alberta electricity market. | |
| | a. Are you a load, a generator, both, neither (e.g. developer, storage, interested party) | HGL is a generation company with coal (dual-fueled), natural gas, and cogeneration assets. |
| | b. What is the approximate size of your load and/or generation? | HGL has offer control over 1,945 MW and is also 50% owner of the Sheerness Generating Station which is currently under PPA (790 MW). According to the MSA’s 2019 Market Share Offer Control Report, HGL has 12% offer control as of September 2019. ⁵⁹ |
| | c. Do you participate in the energy market, AS market, both? | HGL participates in both the energy and ancillary services markets in Alberta. |
| | d. Do you forward hedge? If so, is it physically, financially, both? What percentage of your portfolio is hedged? | HGL has consistently treated this information as confidential and commercially sensitive. HGL is compliant with all relevant legislation and regulations governing hedging activities and reporting. |

Thank you for your input. Please email your comments to: stakeholder.relations@aeso.ca.

⁵⁸ Church, Jeffrey, March 2017, “Defining the Public Interest in Regulatory Decisions: The Case for Economic Efficiency,” CD Howe Institute commentary no. 478, page 3 (pdf). Accessed at: https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_478.pdf

⁵⁹ Alberta MSA - [2019 Market Share Offer Control Report](#) – Sept. 24th, 2019. Offer control calculated on Jan. 31, 2019 and then adjusted to reflect changes in offer control over the course of the year. The 12% for HGL referenced here is representative of the offer control gained from ATCO Power Canada Ltd as part of a transaction finalized on October 1, 2019.