CRA Charles River Associates

Assessment of AESO Recommendations to Adopt a Sealed-Bid Auction for Operating Reserves

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We have been asked by the AESO to provide our opinions about its recommendation to change the design of the Operating Reserve ("OR") market so that it aligns with the disclosure of offer information in the energy market. The main purpose of the AESO's recommendations is to reduce the likelihood of coordination by OR market bidders and other potentially anticompetitive behaviour, while maintaining the benefits of market transparency. We understand that the AESO's recommendations are based primarily on a comprehensive review of the relevant academic literature, other work on auction design and outcomes in electricity markets, stakeholder feedback, and analysis conducted by the Market Surveillance Administrator in relation to transparency of offers in the real-time energy market.[1] We have not conducted empirical analyses of market power or anticompetitive coordination in AESO OR markets. Our opinions are based on an independent review of the relevant literature, our analysis of OR market operations, and our extensive experience in analyzing competition in a wide range of settings and industries.

Summary of Opinions

The AESO has recommended the adoption of a sealed-bid format for OR auctions primarily because such a format is less vulnerable to implicit coordination and price manipulation.[2] The OR markets, and in particular the regulated reserves market, are substantially concentrated, and the AESO has indicated that it has observed instances where the OR auctions have apparently not delivered efficient competitive outcomes.[3] While also recognizing that a sealed-bid auction would reduce the opportunity for real time price discovery compared to the current open auction, the AESO finds that since most bids are received at the end of the bid window, some of the theoretical benefits of price discovery from open auctions are not achieved under the current format. Furthermore, certain data that are useful for price discovery, such as the cumulative offer volume, as well as the clearing price and the cumulative clearing volume, will be visible to market participants immediately after the auctions close under the AESO's recommended format. The AESO will also publish each participant's offer price and volume, asset ID, and offer control party 60 days after the auction.

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[1] AESO (2021, 2022a, 2022b).

[2] AESO (2022a), slide 35.

[3] AESO (2021), slide 36.

Frayer and Ezeokana (2022) of London Economics ("LEI"), in a report for TransAlta,[4] provided an analysis of the AESO's recommendations. LEI has considered the implications of the AESO's recommended format from the perspective of its impact on participation in OR auctions by new entrants and concluded that "the proposed changes are not going to be beneficial to new entrants and therefore would not support improvements in dynamic efficiency."[5] LEI also concluded that, despite the fact that the OR market is concentrated, the market is workably competitive and outcomes are disciplined by competition because large players face competition from existing resources and new entrants. A number of stakeholders, including several smaller market participants, support the AESO's recommended format despite LEI's concerns. The Market Surveillance Administrator supports the AESO's proposal, while recommending that additional analysis be undertaken.

We agree with the AESO that the market features that render a market vulnerable to anticompetitive coordination are present in the current AESO OR markets, including high market concentration, frequent interactions among market participants, and transparency of offers.[6] We have not conducted an empirical analysis of whether there is evidence of collusion or anticompetitive coordination in Alberta's OR markets. However, we note the Alberta Utility Commission's ("AUC") conclusion in Decision D1115-D01-2017 that detecting coordinated behavior in the energy market, including price signaling, is extremely difficult, [7] and we agree with the AESO that it is similarly very difficult to detect anticompetitive coordination in OR markets. [8] However, absence of evidence is not evidence of absence. The existence in the AESO OR markets of market features that facilitate coordination, including transparency of offer data, indicates that there may be a significant risk of coordination in AESO OR markets under the current format. The current open auction format, where all offers are visible to market participants in real time, contributes to this risk.

With respect to the LEI submission, we note that it has provided only cursory analysis of the social benefits (as opposed to the private benefits to market participants) of transparency. Its claims that adoption of a sealed-bid auction is not beneficial to new entrants and will not likely attract new entry are not supported by the academic literature. Important contributors to that literature conclude that sealed-bid auctions are more likely to attract new entry compared to open auctions.[9] Many small producers support the AESO's recommendation to limit offer disclosure, while most larger producers support retaining the current approach. Furthermore, the benefits of market transparency are undermined if bidders

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4 Frayer and Ezeokana (2022), London Economics International, 'Independent evaluation of proposed changes to Alberta's operating reserve market format and information release policies', August 31, 2022 (hereafter "LEI Report").

5 LEI Report, Executive Summary.

6 Motta (2004), page 150, emphasizes "the role of observability of prices and quantities in sustaining collusion."

7 AUC (2017), page 50, para. 215.

8 AESO (2022b), page 32.

9 We discuss the conclusions of Klemperer (2008) and Athey *et al.* (2011), among others, below.

coordinate their offers or even if market participants believe that there is a significant risk of coordination because this distorts the fidelity of the price signal, diluting the benefits of transparency.[10]

It is also our view that because the participants in the energy market largely overlap with those in OR markets, continuation of current practices sustains a risk of cross-market signaling. That is, strategic anticompetitive behaviour in energy markets can be facilitated by information transmitted in OR markets.

Based on the considerations above, we support the AESO's recommendation to adopt a sealed-bid auction for operating reserves with a 60-day delay in reporting offers. The resulting information revelation model would comport with that in the energy market. There is a significant risk that the current auction format has, and will, result in market outcomes that are inconsistent with the fair, efficient, and openly competitive regulation in Alberta. Furthermore, we recognize that transparency promotes price discovery which may contribute to efficiency in certain respects. However, we do not agree with LEI and some market participants that price discovery will be significantly impeded if the AESO's recommendations are adopted.

AESO Operating Reserve Markets Background

The AESO procures operating reserves to maintain system reliability in ensuring the instantaneous balance of supply and demand. ORs may be required to match supply and demand under normal system operating conditions or when unexpected system events occur.

There are several different types of OR that are procured by the AESO:

- **Regulating reserves** are used to balance supply and demand on a minute by minute basis when imbalances cannot be met with energy dispatches.
- **Spinning reserves** are contingency reserves that can be called on by the System Controller on short notice to balance supply and demand in case of an unexpected system event. Spinning reserves are synchronized to the grid but are not generating power for the energy market, and are the fastest reacting contingency reserves.
- **Supplemental reserves** are also contingency reserves, but are not synchronized to the grid.

OR can be active or standby. Active reserves are used to meet system requirements under normal system operating conditions. Standby reserves are used to meet system requirements when procured active reserves are insufficient, and are generally used only when all active reserves have been dispatched.

Procurement of Operating Reserves by the AESO

Operating reserves are procured by the AESO, which is the sole buyer, through the Watt-Ex exchange. Bidders submit their offers for multiple-hour time blocks on a day-ahead basis. OR auctions close sequentially, starting with active regulating reserves, then followed in order and after ten minutes, by

[10] The AESO defines a price characterized by price fidelity as "a price that reflects economic fundamentals, free from distortion or intervention." AESO, Glossary of Terms, https://www.aeso.ca/aeso/understanding-electricity-in-alberta/glossary-of-terms/.

active spinning reserves, active supplemental reserves, standby regulating reserves, standby spinning reserves, and standby supplemental reserves. In the active reserve markets, bidders submit their prices and offers for all hours in a given time block for the next day. The time blocks are on peak (07:00 to 22:59:59), off peak (00:00 to 06:59:59 and from 23:00 to 23:59:59), AM super peak (05:00:00 to 07:59:59), and PM super peak (16:00:00 to 23:59:59 from November to January, and 17:00:00 to 23:59:59 in all other months).

Price and volume offers are submitted by market participants for each OR product during an hour-long window starting at 9:00 each weekday. The AESO first announces a required volume and a bid price. A price offer is a discount or premium to the pool price, which is referred to as indexing. The marginal, or clearing offer, is the highest price that meets AESO's stated requirements (that is, offers are sorted by price, and the clearing price is the price where the total cumulative offered volume just satisfies the AESO's required volume). After each auction closes, the equilibrium price is calculated as the simple average of the AESO bid price and the clearing price. The price for each hour received by each pool participant whose offer is accepted is the actual pool price in the relevant hour plus the equilibrium price.

Information Disclosure in AESO OR Markets

At the start of each OR auction, the AESO announces a bid quantity and a bid price. The volume of each OR that the AESO seeks to procure is based on Western Electricity Coordinating Council ("WECC")[11] requirements and expected market conditions. The procurement process is an open auction where each bidder can observe the price and volume offers that have been submitted in real time as soon as they are submitted. The asset ID and identity of the bidding party associated with a bidder's offer are not visible to other bidders. Clearing prices and indices are published daily. A report containing the clearing price for each product as well as the clearing volumes and offer control party and asset ID is published by the AESO sixty days after auction close in the "Operating Reserve – Offer Control Report".[12] Bidders also have access to variety of other market data in real time.[13]

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11 Information on WECC may be found at https://www.wecc.org/Pages/home.aspx.

12 http://ets.aeso.ca/: Historical - Select Report -> Offer Control – Operating Reserves.

13 The LEI Report, at page 23 states the following:

> "Before each OR auction, Alberta market participants have access to information available on the Watt-Ex platform which provides data on all OR products in the ancillary market, and in addition, have access to other trading platforms that provide energy forwards and gas forwards. Market participants also have access to market information published by the AESO on the ETS website such as supply and demand forecasts, outage reports, 7-days hourly available capability reports, etc. These various information sources enable market participants to estimate a pool price forecast and anticipate their opportunity costs from participating in the OR market, including their potential foregone energy profits. In addition, as gas is traded day-ahead, a generator may be able to lock in gas prices for the next day and therefore have an anticipated marginal cost, which can also influence their offer strategy in the OR market."

Theory of Anticompetitive Coordination

Unilateral exercises of market power are generally viewed as permissible in Alberta energy and OR markets, as long as they are 'extractive' and producers do not 'extend' market power by weakening the competitive constraints imposed by competitors through coordination or other anticompetitive behaviour. Coordinated exercises of market power involve explicit or implicit agreements among competitors that have the effect of increasing prices, either directly through an agreement to increase prices or indirectly through an agreement to reduce production (or, in the case of a procurement auction, the amount of volume offered). While explicit agreements involve direct communication among firms, tacit, or implicit, agreements do not involve direct communications. Conscious parallelism is another form of coordinated behaviour, which does not involve either explicit or tacit agreement among firms, but which results in a 'softening' of competition. This could involve firms matching each other's offers or otherwise behaving less aggressively for fear of a response from rivals.

Economists have identified several factors that are likely to facilitate anticompetitive coordination, based on the theory of repeated games.[14] The following factors have been adopted by competition enforcement agencies, such as the Canadian Competition Bureau and enforcement agencies in the US and Europe. They consist of the ability to: 1) recognize and reach mutually beneficial terms of trade; 2) monitor each other's conduct and determine whether other firms have deviated from the coordinated behaviour, and; 3) credibly respond to deviations from the coordinated behaviour by other firms. Analysis of the likelihood of coordination begins with consideration of market conditions that support these factors, including high market concentration and barriers to entry, repeated and frequent interaction between firms, product homogeneity, inelastic demand, stable demand and costs, and market transparency.[15] It is important to note that not all of these market conditions need to be present for a market to be susceptible to anticompetitive behaviour.

We discuss market transparency and market concentration below. Here we note that interactions between firms are clearly repeated and frequent, as the same firms generally bid in OR auctions for several products every weekday, as well as hourly in energy markets; products are clearly highly homogeneous; demand is very inelastic (and is essentially perfectly inelastic in OR markets); and demand and costs are relatively stable. Fuel prices, in particular natural gas prices, vary over time. But such variation is similar across generators.

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[14] For a more detailed discussion, see section 4.1 in Baziliauskas, Sanderson, and Yatchew (2011).

[15] von der Fehr (2013) (page 102) points out that:

> "Electricity markets are often seen as particularly conducive to tacit collusion, since participants meet very frequently – every day in the spot market – and hence have the opportunity to react quickly to changes in competitor behaviour. However, in most electricity markets, neither bids/offers nor volumes of individual market participants are publicly observable. Therefore, even if other factors tend to facilitate coordinated or collusive behaviour, lack of transparency with respect to individual behaviour makes such coordination or collusion difficult."

Market Transparency

Under the current OR auction format, each bidder can see all other bidders' offers as soon as they are made, although they cannot see the asset ID or the offer control identity associated with other offers. As noted above, for an implicit agreement to be successful, bidders must have the ability to monitor, or at least infer, the offers of other bidders who are included in the agreement group since otherwise they cannot determine whether any other bidder has deviated from the implicit agreement. Without the ability to monitor deviations from an implicit agreement, bidders cannot punish deviators and as a result any agreement would be unstable. Deviations can take the form of offer prices that are lower, or volume offers that are higher than agreed.[16] Bidders can also use their offers to signal each other about when other bidders in the agreement group should submit their agreed offers or what the offers should be.[17] Information about offers made by other bidders need not be perfect to support effective monitoring, since often firms can make inferences about other firms' offers from observations on changes in sales. The fact that asset IDs and offer control parties are not identified in real time in OR auctions does not prevent effective monitoring, since bidders can in effect identify themselves to other bidders in a variety of ways, including by using specific digits in their bids (*e.g.*, bidders may understand that the 23 cents at the end of an offer of $125.23 is associated with a particular asset), or through the timing or patterns of their offers.

In the AESO OR markets, bidders can observe all other bidders' offers in each 10-minute auction as soon as they are made. If a bidder can 'unmask' another bidder's offer, and the second bidder offers a price that is lower or a volume that is higher than agreed levels, the first bidder can 'punish' the deviating bidder by reducing its own price offer or increasing its own volume offer in the same auction, which would reduce the profits of the deviating bidder in that auction. Given that offers are typically submitted very late in the auction window (this is the 'latency' issue discussed by the AESO), there may not be sufficient time for a bidder to punish a deviator in that window. Bidders can, however, punish deviators in, for example the active regulated reserve auction, by reducing their price offers or increasing volume in other OR auctions that occur later in the auction hour, or in the next day's OR auction or in OR auctions that take place over the next few days. Perhaps even more effective punishment of deviations in an OR auction can be meted out in the energy market, which is a much larger market with greater dollars at stake.

Reducing data disclosure such that bidders cannot observe other bidders' offers until well after the auction — as noted, the AESO has recommended that offers, including asset ID and offer control party,

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[16] As noted by Holmberg and Newbery (2010) (page 38):

> "Requiring individual offer curves to be disclosed to regulators makes it straightforward to monitor potential mark-ups and market manipulation. This is a great advantage especially for hydro-dominated markets, which are very complicated to monitor, as production decisions are determined by a prognosis of future inflows to the reservoirs and future electricity prices. Public disclosure should be delayed, perhaps by a year, so that it does not facilitate collusion. To reduce signalling opportunities, it may also be beneficial to only disclose parts of the offer curves around the clearing point, which is enough to monitor potential mark-ups."

[17] Brown *et al*. (2018) and Brown and Eckert (2022) explain MSA concerns that bidders were 'tagging' their offers or using certain bid patterns to reveal their identities and signal other bidders. They find that there appears to be some empirical support for the claim that tagging may have played a role in coordination.

not be disclosed for 60 days — would limit the ability of bidders to signal and monitor each other's behaviour, and would therefore lessen the likelihood of successful coordination. Bidders could potentially make some inferences about each other's behaviour by studying cumulative offer volume, which would be visible during the auction, and clearing prices and volumes, which would be visible to market participants immediately at market close, but these inferences would be costlier and necessarily more imprecise. The risk that bidders could successfully signal each other and enforce agreement would therefore be significantly reduced.

Market Concentration in AESO OR Markets

The AESO OR markets are highly concentrated, particularly in the Regulating Reserve and Spinning Reserve auctions. In 2021, the four firm concentration ratio (the combined market share of the four firms with the highest shares) of Regulating Reserve was about 90%, and in 2022 it was about 80%.[18] The four firm concentration ratio in Spinning Reserve was 70% or higher in 2021 and 2022. The Competition Bureau's 2011 Merger Enforcement Guidelines indicate that it will not generally challenge a merger on the basis of a concern about a coordinated exercise of market power if the post-merger sum of market shares of the top four firms in the market would be less than 65%.[19] Market concentration in AESO OR markets therefore substantially exceeds the Competition Bureau's thresholds.

The AESO has also found that liquidity is limited for Regulating Reserve, but less so in Spinning Reserve and Supplementary Reserve.[20] After conducting its market liquidity analysis and reviewing stakeholder feedback from the consultation the AESO concluded that competition in the OR markets "is not being maximized."[21] Pricing outcomes that do not appear to be efficient have been observed. These include price inversions where products with more rigorous technical requirements exhibit prices below those for products with less rigorous requirements. Furthermore, standby activation prices are consistently above the price of energy.

The AESO has not conducted a rigorous empirical analysis of whether the visibility of market data has resulted in coordinated outcomes, citing the difficulty of finding a natural experiment that could be used to compare market outcomes with and without data visibility, and the difficulty of isolating the effects of data visibility from the many other factors that affect prices.[22] In AUC Decision 21115-D01-2017, the majority of the Commission accepted that "the MSA's evidence that detecting coordinated behavior, including price signalling, is extremely difficult."[23] Klemperer (2004, page 106) also states that potentially collusive behaviour is "hard to challenge legally".

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18 See AESO (2021) slide 28 for 2019 and 2021 concentration ratios, and AESO (2022a) slide 20 for 2022.

19 In the calculation of the post-merger four firm concentration ratio, the firms proposing to merge are treated as a single firm. See Competition Bureau (2011), pages 18-19, paragraph 5.9.

20 AESO (2021) slide 33.

21 AESO (2021) slide 36.

22 AESO (2022b) slide 32.

23 AUC (2017) paragraph 215.

We agree with the AESO, MSA, and AUC that it is difficult to detect coordinated behaviour in electricity markets, given the many factors that affect prices. And it also difficult to empirically assess whether offer visibility has resulted in coordination in OR markets since we cannot directly compare market outcomes with and without visibility. We have not attempted to empirically assess whether coordination has occurred in AESO OR markets. However, proof of anticompetitive coordination is not a necessary condition for justifying the implementation of a market design decision that is likely to reduce the opportunities for producers to coordinate in the market. As noted above, the market conditions that increase the likelihood of coordination are present in AESO OR markets, and the AESO has detected some market outcomes that may be inconsistent with a workably competitive market. The AESO has determined that broader changes to the OR markets are not required at this time to address concerning issues.[24] The sole market factor facilitating coordination that can reasonably be changed is transparency.

Auctions in Electricity Markets

Auction design can have an important impact on revenues and efficiency. Auction designs can be broadly categorized into sealed-bid auctions and open auctions. In a sealed-bid auction, each offer is known only to the bidder. In an open auction, all bids are visible to others in real time (although as noted the identity of bidders associated with offers is not necessarily disclosed). An open auction is therefore transparent to other bidders. A sealed-bid auction is opaque in real time since, by definition, offers are not visible to other bidders during the auction. Depending on when offers are disclosed to other bidders, however, monitoring of offers for punishment of deviations in future auctions can still occur when bids are sealed in real time, if they are disclosed not too long after the auction and the same bidders continue to participate in other auctions. For example, if bidders in the active regulating reserve auction can observe other offers immediately after that auction closes, they can punish deviators in OR auctions that follow in the same day or in the next few days, or in the energy market.

Transparency of bids can positively or negatively impact auction revenues and efficiency. Under certain assumptions, sealed-bid and open auctions can yield the same outcomes. Vickrey (1961) demonstrated that sealed-bid and open auctions produce the same expected revenue under a certain set of assumptions. There is now a large literature that analyzes the effects of different assumptions on market outcomes.

Academic Literature

We understand that the AESO has conducted its own analysis of the economics literature related to auctions generally and bidding in electricity market, with a focus on the effect of auction and bidding formats on the likelihood of coordination and on market outcomes. Our review of the economics literature yields the following insights:[25]

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[24] AESO (2021) slide 43.

[25] Most of the academic literature on auctions analyzes 'regular' auctions, where buyers bid a price to purchase some good. Operating Reserve and other electricity auctions are 'reverse' auctions, where sellers

- Klemperer (2004, page 106) states "a frequently repeated auction market such as that for electricity is particularly vulnerable to collusion, because the repeated interaction among bidders expands the set of signaling and punishment strategies available to them, and allows them to learn to cooperate." Given that the energy market and the OR markets involve most of the same players, this raises the possibility of cross-market signaling and punishment.

- Klemperer (2008) notes that the efficient bidder is generally successful in an ascending (open) auction, while this is not generally true in a sealed-bid auction because bidders cannot revise their bids after observing an offer from a bidder with a lower valuation.[26] We note, however, that if most bidders submit their bids right at the end of the auction, which we understand is typically the case in the AESO OR auctions (*i.e.*, 'latency'), then the efficiency advantage of an open auction relative to a sealed-bid is reduced since there is then limited opportunity for the highest-valuation bidder to beat other offers.

- Klemperer (2008) also points out that there can be little incentive for 'weaker' bidders to bid in an ascending (open) auction precisely because the strongest bidder will almost always win in such an auction.[27] The best strategy for a weaker bidder will often be to sit out the auction to avoid incurring costs in an auction where it has little chance of success. However, while the latency issue may hamper efficient outcomes, it can also mitigate the disincentive for weaker bidders to bid in the auction. Klemperer also suggests that entry deterrence and other predatory strategies can be less profitable in a sealed-bid auction.[28]

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make price and/or quantity bids to a buyer, who then selects the seller or sellers based on their bids. The theoretical results that we refer to apply to both regular and reverse auctions.

[26] Klemperer (2008) at page 19:

> "A key distinction between ascending and sealed-bid auctions for a single fixed prize is that the efficient bidder generally wins an ascending auction, because if a high-valuation bidder is initially outbid it can always raise its bid later. By contrast, a sealed-bid auction may be efficient when bidders are symmetric, but is not generally efficient. The reason is that bidders cannot revise their initial bids, and a bidder with a lower valuation may therefore win at a price that a bidder with a higher valuation could have beaten but did not because it was hoping to win more cheaply. Likewise "ordinary" economic markets that are not "winner-take-all" are typically inefficient, because less efficient firms typically make some sales."

[27] Klemperer (2008) at page 20:

> "Because ascending auctions are always won by the strongest party, it is also often known who that winner will be. There is then no incentive for any other bidders to turn up – a disastrous outcome for the bid-taker, especially if he does not have the ability to set a reserve price (perhaps because he lacks the information)."

[28] Klemperer (2008) at page 20:

> "Furthermore, since entry into an ascending auction can be deterred by even a small disadvantage, entry deterring and predatory strategies of reducing one's own costs, or raising rivals' costs, or making threatening statements, can all be far more profitable than in a sealed-bid auction, or in an "ordinary" economic market. Indeed a common tactic for an incumbent or otherwise advantaged firm is to attempt to (re)structure the bidding process as an ascending auction."

- Athey *et al.* (2011) compare the performance of open bid and sealed-bid auctions used by the U.S. Forest Service using data from 1982 and 1990, and find that:
    - Sealed-bid auctions induce more participation by smaller firms (those without manufacturing capacity, or 'loggers'), and 'loggers' are more likely to win sealed-bid auctions.
    - In one of the two markets studied by the authors (Idaho-Montana), winning bids in sealed-bid auctions are about 10% higher than in open auctions, while in the other market (California), there is no statistically significant difference.
    - They note that collusion in timber auctions has long been a concern in timber auctions and "the prevailing view is that open auctions are more prone to bidder cooperation because participants are face-to-face and can react immediately to opponents' behavior."[29] They also note that "in a sealed bid auction, strong bidders have greater incentive to shade their bids below their true valuations, so a weak bidder can win despite not having the highest valuation."[30] This gives weaker bidders an additional incentive to enter the auction.
    - Based on their empirical analysis the authors find that, for a fixed set of participants (*i.e*., ignoring the effects of entry) "(s)ealed bid auctions raise more revenue, and distort the allocation away from efficiency and in favor of loggers, but the effects are small (less than 1%). The differences are somewhat larger when we account for equilibrium entry behavior: sealed bidding increases revenue by roughly 2-5% relative to a competitive open auction due to increased logger entry. Strikingly, even a mild degree of cooperative bidding by the mills at open auctions–the behavioral assumption most consistent with the observed outcomes in the Northern forests—results in much more substantial revenue differences (on the order of 5-10%). This suggests that bidder competitiveness merits considerable attention in the choice of auction format."[31]
- Several authors[32] have pointed out that uniform-price auctions, such as the AESO's active OR auctions, are more prone to coordination than pay-as-bid or discriminatory auctions. This is because infra-marginal bids do not affect the price received by winners in the auctions so these bids can be a low-cost method for signalling or otherwise supporting a coordination outcome.

29 Athey *et al.* (2011), page 208.

30 Athey *et al.* (2011), page 208.

31 Athey *et al.* (2011), page 210.

32 See, *e.g*., Fabra (2003) and Klemperer (2004).

The AESO Analysis and Recommendations

The AESO considers a number of criteria when assessing a market design.[33] The objectives that are relevant to our analysis include:

- Competition across the energy and operating reserve markets should be maximized
- Barriers to entry should be minimized
- The market design should not enable anticompetitive practices
- Price signals should guide efficient capacity allocation across energy and operating reserve markets
- Price signals should incent efficient investment in reserve-capable capacity
- The opportunity for cost recovery should exist across the energy and operating reserve markets

Anticompetitive coordination in OR markets can harm static and dynamic efficiency. Static efficiency consists of allocative and productive efficiency. An outcome is allocatively efficient if resources are allocated to their highest-value use. Productive efficiency refers to the minimization of the cost of producing a given amount of output. Dynamic efficiency is achieved when societal resources are allocated over time in a way that provides the greatest social benefits over the longer term. It is affected primarily by the extent and pace of investment and, importantly, innovation. In energy markets, dynamic efficiency is promoted by ensuring that producers of energy expect to earn sufficiently high margins in the future so that they have an incentive to invest in generation capacity today and that that they are actively engaged in innovation.

In the AESO OR markets, allocative efficiency is achieved if the socially efficient quantity of OR is produced and procured by the AESO. The AESO decides how much OR to procure based on reliability standards set by the WECC,[34] which is independent of the operation of the OR markets. The demand for each type of OR is therefore, in general, perfectly inelastic. This implies that increases in the price of OR do not reduce demand and therefore do not result in allocative inefficiency in the OR market. They simply result in wealth transfers between consumers and producers.

Productive inefficiency occurs if total market output is not produced at the lowest possible cost. When market outcomes are affected by coordination, higher-cost generation may be dispatched in place of lower-cost generation in OR markets, or an inefficient mix of generation between OR and energy markets may result. The costs of inefficient production are borne primarily by loads and consumers of electricity.

Dynamic inefficiency may also result from coordination. Coordination distorts the price signal and may cause generators to make inefficient investment decisions. Although OR revenues are a fraction of total revenue for producers, they still contribute to investment costs as they form part of the value stack. In addition, this consideration is increasingly important as investment in reserve-capable technology is no longer a guaranteed byproduct of investment in generation capacity (because of the growth in

33 AESO (2021) slide 32.

34 https://www.wecc.org/Pages/home.aspx.

intermittent generation). Finally, as we discuss below, the auction format can have important implications for the decision to participate in the OR auctions.

To address concerns about anticompetitive coordination, the AESO has recommended the use of a sealed-bid auction[35] with offer disclosure lagged by 60 days for operating reserve to replace the current open auction with real time offer disclosure. The AESO has also recommended that the AESO bid price and the cumulative offer volume will continue to be visible during the auction, and the clearing price and clearing volume will be visible to market participants immediately after the auctions closes. These disclosures would provide information about supply conditions to market participants, thereby facilitating some price discovery. Furthermore, the AESO will publish each participant's offer price and volume, asset ID, and offer control party 60 days after the auction.

The primary difference between the current auction and the auction under the AESO's recommendations is that bidders will not be able to observe other bidders' (de-identified) price and volume offers until 60 days after the auction. More information will be disclosed with the AESO's recommended format after 60 days than under the current format: currently, only the volumes of accepted offers and the clearing price for each hour are disclosed, and under the recommended format the price and volume offers of each bidder will be disclosed.

Stakeholder Feedback

London Economics Incorporated (LEI)

London Economics, which was retained by TransAlta Corporation, submitted its comments on the AESO's recommendations on August 31, 2022.[36] TransAlta has the highest share of offer control in the energy market and in the OR markets. The LEI report addressed the AESO's recommendations to change the format of the OR auction to a sealed-bid auction from an open auction and to delay release of OR offer data by 60 days. It concluded that the AESO's recommended changes would not achieve the AESO's objectives of reducing or removing barriers to entry, enhancing the fidelity of the market price signal, and improving the long run efficiency of the OR market.

LEI's main findings are as follows:

1. The OR market is workably competitive and outcomes are disciplined by competition. Even though the OR market is concentrated and hydroelectric resources have a substantial market share, large players face competition from existing resources and new entrants. Furthermore, the OR market is not a separate market because of significant substitutability in supply between the OR and energy markets. A proper competition analysis would recognize that OR markets are not distinct from energy markets. LEI also claims that competition in OR markets has intensified, mainly because of the emergence of new participants, including loads and battery energy storage systems ("BESS").

[35] The sealed-bid auction could either be a first or second price auction.

[36] Frayer and Ezeokana (2022) ("LEI Report").

2. The current auction format does not create any specific barriers to entry, and the 'impression' of a highly concentrated OR market is caused by the technical requirements of OR, the small size of the Alberta energy market, and the natural comparative advantage of certain resource types. The AESO's recommended auction format will not correct for these barriers since a sealed-bid auction may make it more difficult for new entrants to gain timely information, which will increase their perceived risks of participating on the OR market because of the 'winner's curse'.

3. 'Latency' – the observation that most offers are submitted within seconds of the closing of each auction – is not a concern. Latency occurs because it allows market participants to avoid 'inefficient' price wars. Furthermore, latency does not undermine the benefits of real-time disclosure of offer information because it supports price discovery in OR auctions occurring later in the hour of the same day (given the sequential format), as well as in the next day's OR auction and in the energy market. LEI suggests that disclosure of detailed offers can be used by market participants to identify trends over time. In addition, "the pattern of offers in the active spinning reserve auction yields valuable information about market participants' views on scarcity in the real-time energy market."[37]

4. A sealed-bid format for the OR auction with a lag in the disclosure of offer data would undermine price discovery for all market participants. LEI claims that auctions can only be efficient in the short and long terms if information about market conditions and the economic valuation is readily available to all market participants. Limited price discovery may result in allocative and productive inefficiency, and as an example LEI suggests that the AESO may clear offers that result in an inefficient mix of resources committed to the OR and energy markets.

5. LEI claims that OR products 'have common value properties'. Auctions where bidders have common values are susceptible to the 'winner's curse', which causes bidders to bid less aggressively, thereby reducing auction revenues. An open format auction format would resolve the winner's curse and therefore result in more efficient auction outcomes.

LEI's understanding is that the AESO's primary objective in relation to OR market design is to motivate new market participants. According to LEI, this suggests that the AESO is primarily concerned about dynamic efficiency, and therefore "the broad objective of the ongoing OR market review initiative is to evaluate market design changes that may motivate additional new entry by removing barriers to entry (if there are any) and by improving the price signal so it can attract investment and diversify the current mix of OR providers."[38]

The following are our comments on LEI's report.

Market Concentration and Market Power

As noted above, we have not conducted an empirical analysis of the competitiveness of the OR markets, nor have we tested whether there has been coordination in the AESO OR market. We note here only that

[37] LEI Report, page 3.

[38] LEI Report, page 6.

although LEI has provided some evidence that OR markets have become more competitive with new entry, it has not empirically assessed whether outcomes are distorted by coordination, nor has it provided analysis of whether there have been instances of coordination in the AESO OR market. As we discussed previously, the AESO markets are characterized by most of the market conditions that competition authorities in Canada, the US, and Europe have identified as making anticompetitive coordination more likely. These market conditions continue to exist in AESO OR markets and are likely to persist given that the AESO is not considering any structural changes to the market other than limiting data disclosure.

Benefits of Price Discovery

The auctions for OR products are day-ahead and occur sequentially, as noted above. According to LEI, the sequential nature of the OR auctions provides price discovery between products and because OR auctions are day-ahead they also provide price discovery for the next day's energy market (as well as the next day's OR market).

Specific benefits of offer disclosure cited by LEI include the following:

1. OR providers may be able to improve the acceptability of their offers the next day by studying the offer patterns of recent days with similar supply-demand conditions.[39]

2. The active spinning OR market provides valuable information to market participants about the next day's real-time energy market. The offer curve in the spinning reserves market provides a market view of how pool prices could settle the next day: "For example, if the spinning market offers are clustered around deeper discounts to pool prices, that points to the likelihood of higher volatility or the likelihood that other participants expect tomorrow's market may settle at higher pool prices."[40]

3. There is significant uncertainty in the OR markets. The pool price is unknown at the time of the auction, and because the OR market is day-ahead, OR market participants have to develop pool price forecasts and marginal cost estimates to minimize the risk of uneconomic commitments.[41]

4. Another uncertainty is the result of the mix of suppliers with different technologies, costs, and commercial objectives: "In the current open auction setting, OR providers can monitor the offers of their competitors. And based on the offered quantities and price, they can adjust their offers to improve the probability of clearing."[42]

5. Adoption of a sealed bid auction would cause even larger disparities in the information between large and small market participants.[43]

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39 LEI Report, page 24.

40 LEI Report, page 24.

41 LEI Report, page 24.

42 LEI Report, page 25.

43 LEI Report, page 25.

Some of the benefits cited by LEI are related to the probability of a bidder's offer clearing or being accepted (#1 and #4 above). LEI does not explain, however, why transparency that increases the likelihood that a specific bidder's offer is accepted is a benefit to the *market* rather than to the bidder. Studying previous offer patterns in recent days may allow a bidder to reduce its offer to minimize the risk that the offer is not accepted, but it may also allow the bidder to increase its offer at minimal risk of non-acceptance. It is not clear why one would expect bidders to use the information on other bidders' offers to improve their bids, or otherwise bid in a way that would enhance the efficiency of market outcomes rather than just improve bidders' profits. In fact, as we discussed above, there is a material risk that bidders will study other bidders' offers to facilitate coordination.

LEI provides only one concrete example (#2 above) in which visibility of offer information (as opposed to price information) improves the ability of market participants to refine their forecasts of next day markets. In LEI's illustration, offer curves in the active spinning OR market provides information about how pool prices could settle the next day, and provides an example where offers are clustered around deep discounts to pool prices, which would indicate higher volatility or a possibility that other participants expect tomorrow's market may settle at higher pool prices. Again, it is not clear why this represents a benefit to the market, either in terms of lower clearing prices or a greater degree of efficiency in the next day's energy market, rather than to bidders, who may be able to use this information to reduce their bids. In any case, to the extent that benefits to the market from visibility of offers in the active spinning OR market exist, the magnitudes of any such benefits are uncertain, and LEI provides no evidence that these benefits to the energy market are material.[44]

Implications of Common Values

LEI asserts that in auctions with 'common value traits', reliance on private information can "chill market participation and drive some participants away".[45] Common value auctions are those in which bidders would have the same value for the auctioned product if they had the same information. In such auctions, each bidder has a potentially different expected value for the product, and if all bidders are naive, the bidder with the highest expected value will win the auction since she will make the highest offer. However, the naive winning bidder will tend to overpay for the product because her expected value is higher than the true value of the product, which is represented by the expected value averaged across all bidders.[46] This is the 'winner's curse'. When bidders are assumed to understand that they are bidding in a common value auction (*i.e.*, they are not naive), they will bid less aggressively in order to avoid the winner's curse, and the winning bid is lower than it would otherwise be. In a pure private value auction, each bidder's value for the product is independent of the valuations of other bidders and there is no winner's curse. In an efficient private value auction, the highest valuation bidder makes the winning bid.

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44 von der Fehr (2013) (page 88) notes that "requiring market participants to reveal private information may induce behaviour intended to conceal or distort this information." Thus firms may submit bids that are strategic but non-collusive, which would distort the price signal and limit the benefits of price discovery even when offers are not intended to support collusion.

45 LEI Report, page 32.

46 An example of a pure common value auction is an auction for a jar of pennies, which has the same value for all bidders.

As noted by LEI, weak bidders in private value auctions – those with low valuations for the product (or high costs, in the case of a procurement auction like the OR auctions) – know they are unlikely to be successful in the auction and may therefore decline participation to avoid the costs of bidding when the auction is open. These weak bidders are more likely to be new entrants, so that open private value auctions tend to discourage new entry. LEI also notes that some mechanisms have been used to encourage the participation of new entrants, including set-asides and the adoption of a sealed-bid auction, which gives weak bidders a better chance of winning. According to LEI, increasing the chances of a victorious weak bidder creates productive inefficiency because it increases the likelihood that low-value bidders win the auction.

LEI suggests that the AESO OR auction has common value traits, and in fact "probably has a higher proportion of common value than private value",[47] citing in support that winning bidders receive a single (common) equilibrium price (but not noting that this is not true for standby OR) and indexing to a common pool price. LEI's conclusion is that "a sealed bid process (where there are asymmetries of information) is an inferior option for promoting competition and motivating new entry."[48] LEI further suggests that it is easy to see how "the issue of information asymmetry can arise to be a core issue. Each market participant will have different information signals going into the auction and this could reduce the efficiency of the auction for both the participants and auctioneer..."[49] LEI further indicates that "(t)he dissemination of information helps refine the participants' views on the value of the product being sold/bought and is generally considered to be efficiency-enhancing because it reduces private values and uncertainties, and in so doing motivates more aggressive competition. The risk-reduction benefits of additional information can also expand the horizon of bidders (statically, by lowering the threshold cost of participation, and dynamically, through incentives for new entrants). It is therefore important to not prevent or artificially limit price discovery and information dissemination. In the absence of valuation-enhancing information (such as public value information) and with procurement of a product that has majority of common value traits, the issue of a winner's curse arises. A sealed bid format will therefore be prone to the negative effects of winner's curse – undermining the AESO's overarching objectives."[50]

While LEI suggests that there is a significant common value components in the AESO's auctions, primarily because bidders receive the same price (at least in the active auctions) and the OR price is indexed to the pool price, it is not clear that common values dominate. LEI provides minimal, if any support, for their claim that the OR auction is dominated by common values, and the fact that bidders have private information about their costs suggests that there is a significant private component to bidders' valuations.

47 LEI Report, page 33.

48 LEI Report, page 34.

49 LEI Report, page 36.

50 LEI Report, page 36.

Klemperer (2008)[51] notes that the empirical economics literature has found that many auctions where bidders have private information about costs and yields have large common values. LEI has provided no evidence that this is the case in the present setting.

On the one hand, LEI acknowledges that a sealed-bid format can increase participation in a common values auction by new entrants, since their likelihood of winning is higher in a common value auction (which may lead to productive inefficiency), but on the other hand they say that a sealed-bid option is inferior for motivating new entry. The economic literature indicates that new entrant participation is more likely in sealed-bid auctions.

Market Participants

A number of stakeholders supported the AESO's recommended changes to the disclosure of data while others were opposed. Large market participants (TransAlta, Capital Power, Heartland Generation, ENMAX and Suncor) oppose reducing OR market visibility. Several other stakeholders support the AESO's recommendations to reduce transparency, including Blue Earth Renewables, the Canadian Renewable Energy Association, Enel North America, the Office of the Utilities Consumer Advocate, Versorium Energy, Voltus Energy Canada, Campus Energy, and the Industrial Power Consumers Association of Alberta. TransCanada is not aware of evidence that offer transparency is resulting in anticompetitive outcomes. Enfinite Power, Greengate Power, IPPSA, URICA Asset Optimization, and Millar Western Forest Products support continued market transparency. The MSA supports the AESO's proposal, but encouraged the AESO to conduct analysis of the effects of disclosing offer prices on OR market outcomes.

The following is a brief summary of stakeholder responses.[52]

Large Market Participants

TransAlta. Does not support the AESO's recommendations and calls the AESO's observation that market transparency creates the opportunity for anticompetitive practices 'specious'. It further says that full offer visibility 'drives strong competitive tension' and reduces offers and prices. TransAlta suggests that adoption of a sealed-bid format would remove the only scarcity price available to participants, which reduces competition. A sealed-bid format does not allow bidders

[51] Klemperer (2008) at page 27:

> "Furthermore, in many cases it is hard to distinguish whether or not an auction or market is common or private values – that is, from a given bidder's perspective does other bidders' private information relate to others' valuations, or also to this bidder's actual valuation? Moreover, even if the situation is truly common values, do bidders bid as if others' information matters to them?, or do they bid as if there were private values? If the latter, then any common value effects are even less important."

[52] AESO, Stakeholder Comments on Letter of Notice for Additional Feedback from Stakeholder Consultation Session on the Operating Reserve Market Review ("Operating Reserve Market Review"), January 10, 2022; Stakeholder Comments on Letter of Notice for Additional Feedback from Stakeholder Consultation Session 2 on the Operating Reserve Market Review ("Operating Reserve Market Review"), May 16, 2022, and; Stakeholder Comments on Letter of Notice for Additional Feedback from Stakeholder Consultation Session 3 on the Operating Reserve Market Review ("Operating Reserve Market Review"), October 6, 2022.

to adjust offers within the auction and may lead to insufficient offer volumes. There are significant differences between OR markets and energy markets such that reducing transparency of OR markets is not warranted. Participation in OR markets is not mandatory and the requirements for participation in OR markets is more stringent, which increases the risks of supplying in the OR markets. The fact that OR markets are day-ahead also increases the risks of market participation. Specific concerns with reducing transparency are that reducing offer disclosure would prevent the timely transmission of information that the market requires additional supply and would also result in suppliers making a poor evaluation of their own competitiveness relative to other offers in the supply stack.

Capital Power. Does not oppose the adoption of a sealed-bid format, but suggests that offer data should be disclosed. Publication of the clearing price immediately after the auction is necessary to allow market participants to ensure price discovery in later rounds or next day. It would be helpful to disclose other information such as the aggregated bid volume submitted at the floor price, fully granular stack details should then be provided after the close of the auction, which would allow market participants the ability to respond competitively for the next round of auctions.

Heartland Generation. Does not support the AESO's recommendation and rather supports disclosure of market information shortly after the market clears. A sealed-bid auction would reduce market transparency and increase complexity by, for example, increasing forecasting requirements and market assumptions, which would act as a barrier to entry for smaller market participants. The AESO has not demonstrated the need to withhold information from the market. The offer curve provides information about market liquidity, which informs participation and allows competition to be better reflective of market information.

ENMAX. Offer transparency should be maintained and disclosure of some additional (unspecified) data could benefit the market.

Suncor. Partially supports the adoption of a sealed-bid auction. A sealed-bid auction could address concerns about early and extremely late offers. Suncor disagrees with the AESO's proposal regarding disclosure. Data disclosure supports efficient markets. Only supports a sealed-bid format if the offer stack is made visible immediately after the auction to inform participation in auctions occurring on the same day.

Other Market Participants

TransCanada. Not aware of evidence that offer transparency is creating anticompetitive practices. Transparency can increase competitive response. Recommends maintaining current format.

Blue Earth Renewables. Supports the proposed changes to offer transparency.

Canadian Renewable Energy Association. Supports the proposed changes to offer transparency.

Enel North America. Supports the proposal to align OR offer disclosure with the energy market.

Enfinite Power. Removing information does not aid in a healthy and competitive market. A 60-day lag for offer disclosure does not prevent larger market participants from having superior visibility to market behaviour. The AESO should release more detailed offer information to increase offer competitiveness. Market visibility will affect offer behaviour in auctions occurring on the same day.

Greengate Power Corporation. Adoption of a sealed-bid auction will make little difference because all offers are submitted last minute. Greengate supports sharing all bid data ex-post as soon as possible. Encourages the AESO to consider daily/weekly frequency. Moving to a sealed-bid auction will reduce visibility, provide less information, and introduce more risk for new market participants. New entrants appreciate market stability.

Independent Power Producers Society of Alberta ("IPPSA"). IPPSA participants are opposed to removing market information. Offer information should be revealed shortly after market close, not after 60 days. Reducing transparency increases bidding complexity which acts as a barrier to competition.

Market Surveillance Administrator ("MSA"). The MSA indicated that it supported the AESO's proposed alternative in its comments on session 1. In its comments on session 2, the MSA said that the AESO should consider the principles in the FEOC regulation, and in particular "to strike an appropriate balance between market participant commercial information sensitivity and adding to a transparent and information-rich environment to support a fair, efficient and openly competitive market." It also noted that publication of offer information 60 days after the auction will align with the timing of disclosure of offers to the power pool. Finally, the MSA indicated that stakeholders may find it useful if the AESO undertook analysis of the impact of offer price information on the OR market and publicly presented this analysis.

The Office of the Utilities Consumer Advocate. Agrees that fully transparent offer information potentially increases the risk of anticompetitive behaviour. A sealed-bid format will reduce market power risk and increase efficiency in the long run.

URICA Asset Optimization Ltd. Supportive of the move to a sealed-bid auction 'from a holistic' perspective', since it may allow more assets, including generation and load, to participate in the market. Current market conditions do not however support market participation in the supplemental market by smaller generation and load because of the costs of installing equipment for this market. If the AESO adopts a sealed-bid format, the AESO should disclose offered bids and prices similar to the information provided currently.

Versorium Energy Ltd. Supports the AESO initiative. Supports publishing the clearing price for a product immediately after the auction for that product clears. The AESO should also provide, at least, total volume offered for each product in each trading bock and total product purchased by AESO.

Voltus Energy Canada. More detailed offer information is not required to form a competitive offer strategy. It is helpful to see the clearing price immediately following procurement.

Campus Energy. Does not expect the removal of offer transparency to have a meaningful long run impact on incentives, offer behaviour, average OR indices, OR market shares or total cost of OR. Information on the clearing price immediately after the auction provides sufficient transparency and openness, as offers should be based on generators' economics and opportunity cost and should not need to consider the information of another market participant. Knowledge of the AESO's volume and bid/cap price is sufficient for Campus Energy's participation.

Industrial Power Consumers Association of Alberta. Agrees with the AESO's recommendation to adopt a sealed-bid format. Information should not be released until post procurement to foster competition.

Millar Western Forest Products Ltd. Having offer visibility allows a facility to know in advance whether procuring reserves is possible.

Several market participants oppose the AESO's recommended changes because offer visibility allows bidders to refine their bids; reduce the risks of market participation, thereby presumably encouraging entry or fuller participation by smaller producers, and; assist the market in identifying situations where increased supply is needed. (Notably, stakeholders opposing the AESO's recommended changes do not provide any explanation or analysis of why disclosure of offer curves in real time incrementally improves market outcomes, in terms of efficiency or the purposes of the FEOC regulation relative to the disclosure of the data recommended by the AESO.)

Some stakeholders have framed their opposition to the AESO's recommendations in terms of reducing risks for entrants or otherwise facilitating participation in OR markets by smaller market participants. However, while all larger market participants oppose reducing offer disclosure and TransAlta and Heartland Generation specifically oppose the AESO's recommendations in part because limiting offer disclosure would discourage entry, the opinions of smaller participants are split. Some smaller market participants, such as Enfinite Power, Greengate Power Corporation, and URICA also oppose the AESO's recommendations because they argue it would make entry more difficult. Others (Blue Earth Renewables, the Canadian Renewables Energy Association, Enel North America, Versorium Energy, Voltus Energy Canada, and Campus Energy) support the AESO's recommendations.

An important consideration that was not directly addressed by stakeholders who oppose the AESO's recommendations is that in order for offer transparency to aid in price discovery in a way that improves market outcomes, offers must respond to demand and supply conditions, either current or expected, and be free of anticompetitive motivations, such as coordination, predation, or other forms of bidding that the MSA refers to as market power 'extension'. To the extent that offers are part of an anticompetitive strategy, they do not provide useful information that other bidders can use to reliably understand costs or market conditions, or reduce uncertainty, and therefore reduce the fidelity of the price signal.[53] Furthermore, the mere possibility in the minds of bidders that other bidders' offers may be tainted by anticompetitive motivations limits the efficacy of offers in price discovery. In fact, an important reason

[53] As noted previously, von der Fehr (2013) (page 88) notes that "requiring market participants to reveal private information may induce behaviour intended to conceal or distort this information."

to reduce transparency is to improve the fidelity of the prices that would continue to be disclosed — the value of disclosing only the clearing price and clearing volume when market participants are confident that they are free of distortions may be higher than the value of disclosing more detailed offer information that participants believe may be driven by anticompetitive motivations.

Summary

The AESO OR markets have characteristics that make them vulnerable to anticompetitive coordination. A high degree of real-time market transparency can contribute to this vulnerability. The AESO has indicated that there is evidence that the OR markets sometimes produce non-competitive and inefficient outcomes, although the AESO has not conducted an empirical analysis to determine whether such coordination occurs. We have also not conducted such an analysis. The AUC, the MSA and the AESO have recognized that it is extremely difficult to detect coordinated behaviour in energy markets, and we believe that this is also true for OR markets.

The AESO has recommended changes to the OR auction rules to make the market less transparent in real-time, and therefore less vulnerable to coordination. Several large stakeholders have suggested that transparency, and in particular real-time offer disclosure, promotes price discovery, which makes the OR markets more competitive. LEI, as well as some stakeholders, have suggested that transparency encourages entry and expansion by smaller producers, although a number of small producers support the AESO's recommended changes. Stakeholders who oppose the AESO recommendations do not provide evidence that price discovery will be hindered if the recommendations are implemented. The cumulative offer volume, as well as the clearing price and the cumulative volume, will be visible to market participants immediately if the AESO's recommended auction format is implemented, and the AESO will also publish each participant's offer price and volume, asset ID, and offer control party 60 days after the auction. Market participants will also have access to a significant amount of public data.

We therefore support the AESO recommendations as this will reduce the likelihood of coordination and support the fidelity of the price signal, which may be at risk if market participants believe that offers may be distorted by coordination.

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