

Shawn Cronkwright
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Dear Shawn,

This submission responds to the Independent Electricity System Operator (IESO) draft *Real-Time Calculation Engine Detailed Design Issue 1.0* released on August 31, 2020.¹ This document is part of a series of draft detailed design documents defining how the IESO-Administered Markets (IAM) will be fundamentally reformed through the IESO Market Renewal Program (MRP) initiative.

Power Advisory LLC has coordinated this submission on behalf of a consortium of renewable generators, energy storage providers, and industry associations (i.e., the “Consortium”²).

GENERAL COMMENTS AND RECOMMENDATIONS

Overall, the Consortium supports IESO’s plans to implement a Day-Ahead Market (DAM) and associated reforms to the Real-Time Market (RTM) within IAM.

Consistent with the Consortium’s submission commenting on the draft *Day-Ahead Market Calculation Engine Detailed Design Issue 1.0*³, the Consortium offers these general points relating to pricing within RTM.

Inputs to Set Prices Require More Clarity, Should Best Reflect Shortage/Scarcity Conditions and Power System Supply Needs, and Examples are Needed

As the Consortium recommended in our submission commenting on the draft *Offers, Bids and Data Inputs Detailed Design Issue 1.0*, IESO should commit to shortage/scarcity pricing in MRP design and rules to accurately value energy and operating reserve (OR).

We previously referenced the events, actions, and market outcomes from IESO’s July 10, 2020 Energy Emergency Alert Level 1 (EEA1). EEA1 signalled potential for an IESO declaration of an Emergency

¹ See <http://www.ieso.ca/en/Market-Renewal/Stakeholder-Engagements/Energy-Detailed-Design-Engagement>

² The members of the Consortium are: Canadian Renewable Energy Association; Axiom Infrastructure; BluEarth Renewables; Boralex; Capstone Infrastructure; Cordelio Power; EDF Renewables; EDP Renewables; Enbridge; ENGIE; Evolgen (by Brookfield Renewable); H2O Power; Kruger Energy; Liberty Power; Longyuan; NextEra Energy Canada; Pattern Energy; Suncor; and wpd Canada.

³ See Consortium submission under the September 24, 2020 date located at <https://www.ieso.ca/Market-Renewal/Stakeholder-Engagements/Energy-Detailed-Design-Engagement>

Operating State, and is a very good example how wholesale market-clearing prices did not reflect actual power system conditions and supply needs – sending inefficient price signals to the market. This example provides clear rationale why inputs to setting Locational Marginal Prices (LMPs) will be important and should reflect shortage/scarcity power system conditions and supply needs, and limit IESO interventions within the price-setting process.

Additional to the events from July 10, 2020, within the October 8, 2020 IESO Bulletin, IESO offered an Assessment of the Operational Incident on July 9, 2020. In this Bulletin, IESO stated the following.

“On July 9, a 230 kV transmission circuit connected to the Bruce Power site was forced out-of-service for emergency repairs. To prevent potential damage to transmission and generation equipment in the area, the IESO prepared and implemented an operational plan, which included use of a Remedial Action Scheme.

In this case, the IESO mistakenly selected an incorrect Scheme option which immediately triggered a Bruce generator to shut down, as per the design of the Remedial Action Scheme. The IESO is reporting this operational incident because it had a market impact, increasing market payments to suppliers by an estimated \$17 million, and correspondingly reducing their contractual payments paid through the Global Adjustment by the same amount. While there was no increase to system costs as a whole, due to the way costs are allocated Class A customers incurred an estimated \$2M in additional costs while Class B costs were reduced by \$2M.”

Similar to the situation described above regarding the events of July 10, 2020, it appears that IESO’s interventions may have inefficiently suppressed market-clearing prices during the peak afternoon hours of July 9, 2020. The Bruce 1 nuclear generating unit came off-line early in the day by hour-ending (HE) 9 on July 9. In the wake of that incident and rising electricity demand, as temperatures increased throughout that day, market-clearing prices continued to rise into the afternoon hours – with the Hourly Ontario Energy Price (HOEP) hitting \$203/MWh in HE 16. As power system conditions tightened, IESO then activated hourly demand-response (HDR) between HE 15 and HE 19, according to its Advisory Notice. Consequentially, market-clearing prices subsequently dropped to \$108/MWh by HE 19, even though demand remained higher than 24,000 MW.

While there are many variables in any given five-minute dispatch interval that can impact five-minute Market-Clearing Prices (MCPs) and overall power system conditions, IESO interventions when the power system is tight supply – particularly when there is an unexpected outage at a nuclear generating unit – can severely suppress market-clearing prices creating market inefficiencies through inaccurate price signals. The lack of a clear price signals within the IAM undermines the overall efficiency of Ontario’s wholesale electricity market.

Further, when market-clearing prices are inefficiently suppressed due to IESO interventions, revenue adequacy concerns increase. That is, market-clearing prices that best reflect shortage/scarcity conditions result in needed and justified inframarginal rents contributing to fixed cost recovery for generators and

other resources. To the extent that market-clearing prices do not accurately reflect shortage/scarcity conditions, additional resource adequacy mechanisms (e.g., Capacity Auctions, contracts) will be required to ensure continued operations of needed generators and other resources, as well as sufficient revenues to ensure development of needed new generation projects and other resources.

As the Consortium commented within its submission regarding the draft *Day-Ahead Market Calculation Engine Detailed Design Issue 1.0*, regarding some of the inputs used to set LMPs, more clarity is needed for these components:

- More details are required to inform market participants (MPs) and stakeholders on IESO's application of the constraint violation penalty curves, especially within RTM due to the need to ensure all system needs are met within real-time dispatch intervals to ensure power system reliability – in particular, clear numerical examples on how LMPs will be set when constraint violation penalty curves are applied, and when IESO can relax constraint violation penalty curves so as they will not set LMPs;
- As stated in the Consortium's November 16, 2018 submission to IESO commenting on the draft Single Schedule Market (SSM) High-Level Design (HLD)⁴ and the Consortium's August 29, 2019 presentation to IESO's Market Development Advisory Group (MDAG) regarding IAM workplan priorities⁵, the Consortium is still of the opinion that IESO should implement shortage/scarcity pricing for energy and OR within MRP, and consider implementing an OR Demand Curve (ORDC) and/or some form of Extended LMP (ELMP) where certain variables are relaxed in respective calculation engines to permit non-convex costs (e.g., speed no-load) to be an input towards setting LMPs⁶, and not be left to some subsequent phase post MRP implementation (as these market design features exist in wholesale markets across the U.S.); and,
- IESO inputs relating to OR requirements and securing additional OR, IESO adjustments to centralized forecasts for variable generator (VG) energy production, IESO adjustments to demand forecasts, IESO determination on reliability constraints, and IESO use of emergency control actions, all require more details and examples regarding how IESO interventions could impact generator and other resource scheduling and dispatch instructions, as well as setting LMPs. Process details are needed, particularly regarding how IESO makes decisions whether to adjust or activate these inputs.

⁴ See IESO November 22, 2018 list of MP and stakeholder submissions commenting on draft SSM HLD, located at <http://www.ieso.ca/en/Market-Renewal/Stakeholder-Engagements/Market-Renewal-Single-Schedule-Market>

⁵ See Consortium August 29, 2019 presentation, located at <http://ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Market-Development-Advisory-Group>

⁶ ELMP was discussed during August 29, 2019 MDAG meeting, see EPRI's presentation Education – Price Formulation located at <http://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Market-Development-Advisory-Group>. For example, MISO uses an ELMP methodology to set market-clearing locational prices for energy and OR.

Proposed Price Settlement Floor Requires More Analysis and Specific Stakeholder Engagement

As stated within the Consortium's submissions commenting on the draft *Market Power Mitigation Detailed Design Issue 1.0*⁷ and the draft *Day-Ahead Market Calculation Engine Detailed Design Issue 1.0*, the Consortium continues to believe that negative pricing will impact IAM post implementation of MRP. We believe this will be the case relatively more so within some sub-zones within the Northeast and Northwest zones, due to projected demand/supply balance and supply mix comprised of many baseload and low marginal cost generation facilities.

Given the Consortium's points made in its submission commenting on IESO's proposed -\$100/MWh price settlement floor in DAM based on the draft *Day-Ahead Market Calculation Engine Detailed Design Issue 1.0*, and now again within RTM based on the same price settlement floor as specified within the draft *Real-Time Calculation Engine Detailed Design Issue 1.0*, the Consortium recommends that IESO conduct further analysis on the potential impacts of implementing a -\$100/MWh price settlement floor within MRP detailed design, and consult with MPs and stakeholders due to the following reasons:

- Potential to create or exacerbate surplus baseload generation (SBG) in some sub-zones – creating issues for dispatch and curtailment;
- Provisions and settlements of contracts and regulated framework may financially protect some generators, however IESO may still have operational issues regarding dispatch and curtailment (e.g., exacerbated SBG);
- 'Must-run' generators may face competition to dispatch and energy production – potentially creating less 'must-run' and production of less energy; and
- Dynamics of the proposed price settlement floor and decisions/outcomes that will be required under specific circumstances to curtail energy production from some generators will have significant implications for future contract amendments relating to applicable MRP design and associated amendments to the IESO Market Rules for some generators.

The Consortium will be happy to discuss the contents of this submission with you at a mutually convenient time.

Sincerely,

⁷ See <http://www.ieso.ca/Market-Renewal/Stakeholder-Engagements/Energy-Detailed-Design-Engagement>



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