ONTARIO ENERGY BOARD

The Market Surveillance Panel

The Market Surveillance Panel in the Renewed IESO-Administered Markets

August 2025

Ontario Energy Board

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1 INTRODUCTION

This report informs market participants and other interested parties about Ontario's Market Surveillance Panel (MSP) and its mandate to monitor, investigate, review and report on activities related to the IESO-administered markets, with a focus on market participant conduct and the efficiency and competitiveness of Ontario's wholesale electricity market. The report explains how the MSP will continue to perform its mandate within the Independent Electricity System Operator's (IESO) renewed markets.[1]

The MSP is a statute-based panel of the Ontario Energy Board (OEB). It serves as the market monitor for the Ontario wholesale electricity markets, which are administered by the IESO. The MSP's mandate is set out in the *Electricity Act, 1998*, and the OEB's By-law #2. The work of the MSP is supported by the Market Assessment Unit (MAU) within the IESO, in accordance with a Protocol between the IESO and the OEB.

The renewed markets were launched on May 1, 2025, as part of the IESO's Market Renewal Program (MRP). The IESO expects that "MRP will deliver a more efficient, stable marketplace with competitive and transparent mechanisms that meet system and participant needs at lowest cost."[2] To deliver on its stated mission, MRP replaces the two-schedule market with a single-schedule market, introduces a day-ahead market and implements an enhanced real-time unit commitment program. In addition, the IESO has introduced a new market power mitigation framework to address the potential for suppliers to exercise market power in the energy and reserve markets.

Over the past two decades, the MSP has recorded the findings of its activities in reports published by the OEB. These reports have frequently included recommendations to the IESO to address:[3]

[1] This report provides an overview of the MSP and its mandate with reference to the renewed markets. As such, this report is not a monitoring document as described under Bylaw #2, Article 4.2.1. The MSP may issue new or revised monitoring documents in the future and is reviewing all previous monitoring documents issued under the legacy market to assess their applicability to the renewed markets.
[2] The IESO website provides a description of the components of MRP and the program's objectives. The IESO's objectives for the MRP are described similarly in numerous public reports accessible on the IESO website.
[3] The MSP has occasionally made recommendations to government, the OEB and the former Ontario Power Authority.

- Flaws in the market rules, market design and the overall market structure, which result in outcomes that are inconsistent with the efficient and fair operation of a competitive market
- Inappropriate conduct by market participants
- IESO activities and procedures that adversely impact efficiency or effective competition.

In several cases, the MSP's reports have influenced IESO decisions to amend the market rules, or to modify its activities or the market design for the purpose of improving market efficiency and promoting effective competition.[4] In some instances, the MSP's reports have informed activity by the IESO's market rule enforcement body, the Market Assessment and Compliance Division (MACD), sometimes resulting in remedial actions, settlement repayments or financial penalties.[5] The IESO has frequently cited the MSP's reports in support of the need for MRP.[6]

The MSP's mandate does not change with the implementation of the renewed markets – the MSP will continue to assess and report on the IESO-administered markets and the conduct of market participants. However, the complexities of the renewed markets have increased relative to the legacy markets. In preparation for the renewed markets, the MSP has developed new tools and indicia.

The purpose of this report is to offer interested parties insights into the on-going role of the MSP and its mandate, and to explain how the MSP intends to monitor the renewed IESO-administered markets. As the renewed markets operate and evolve, so too will the MSP's approach to market monitoring.

The remainder of this report is organized as follows:

- Section 2 describes the purpose of market surveillance in deregulated, competitive wholesale electricity markets, and the role

[4] See Appendix 1 for select examples of past MSP report findings and recommendations.
[5] This includes the MSP's Report on an Investigation into Goreway Station Partnership and Report on an Investigation into Possible Gaming Behaviour Related to Congestion Management Settlement Credit Payments by Abitibi-Consolidated Company of Canada and Bowater Canadian Forest Products Inc.
[6] References to various MSP reports can be found in the IESO's two business case studies on the benefits of MRP: The Future of Ontario's Electricity Market: A Benefits Case Assessment of the Market Renewal Project, The Brattle Group, 2017, and Market Renewal Program: Energy Stream Business Case, IESO, 2019, and in other MRP supporting documentation.

and responsibilities of the MSP in Ontario's electricity sector, including its structure and its mandate to monitor, investigate, review and report on the IESO-administered markets. This includes a discussion of monitoring indicia and tools used under the legacy markets, some of which will remain relevant under the renewed markets.

- Section 3 discusses the changes made to the markets under MRP and key aspects of the MSP's approach for monitoring the renewed markets.
- Section 4 offers summary remarks.

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2 THE ROLE AND RESPONSIBILITIES OF THE MARKET SURVEILLANCE PANEL

2.1 The Purpose of Market Surveillance in Competitive Electricity Markets

A specialized surveillance function is common to all jurisdictions with competitive wholesale electricity markets. The consistent presence of this function reflects the unique features of electricity as a product, the elaborate rules and regulations governing the operation of the electrical system and markets, and the potential for harm to consumers and competition from inappropriate or anti-competitive conduct.[7] The surveillance function is performed by an entity commonly referred to as "the market monitor." The market monitor is tasked with conducting day-to-day monitoring of the markets and with reviewing and investigating anomalous market outcomes and conduct as well as potential flaws in market design or structure. The market monitor also reports to the appropriate regulator or governing authorities instances where the markets are not performing according to their stated objectives, with a typical focus on the objectives of effective competition and efficiency.[8]

The organizational structure of the market monitor varies across jurisdictions. Some are managed within the system operator, some are managed externally by third parties, while others are a hybrid model of both an internal and external monitor. The MSP is an external monitor (appointed by the OEB), that is supported by staff within the MAU who are employed by the IESO. Regardless of structure, all market monitors are designed to perform their responsibilities independent of the influence of market participants and the system operator.[9]

[7] Gaming of Electricity Markets — The Ontario Experience, N. Campbell, Energy Regulation Quarterly, July 2014 – Volume 2, Spring 2014. It is the special features of electricity markets that set them apart from most markets that are subject only to general oversight by competition law authorities.
[8] Market Monitoring Units in Regional Transmission Organizations and Independent System Operators, 111 FERC ¶ 61,267 (2005) at page 1 for a description of the purpose and role of market monitors in the United States.
[9] Wholesale Competition in Regions With Organized Electric Markets; Proposed Rules, 125 FERC ¶ 61,071 (2008) page 171.

Market monitors are typically not enforcement agencies, compliance officers or regulators.[10] They do not have powers to take remedial action or impose sanctions on market participants or the system operator. Instead, market monitors are independent agencies that specialize in the study of firm behaviour, market dynamics and performance, and are best able to analyze market data and to propose potential remedies generally focused on market efficiency and competition for consideration by the appropriate regulatory or governing authorities.

Competitive wholesale markets for electricity were introduced, at least in part, to harness the forces of competition, which in turn leads to economic efficiency by encouraging firms to be more productive and innovative. Market monitoring plays an important role in improving the efficiency, integrity and transparency of competitive wholesale markets. As independent specialists, market monitors expose instances where the market design or structure, system operator's activities or conduct of market participants does not align with the goals of competition and economic efficiency, and propose remedial action to regulatory and other governing authorities.[11]

2.2 The Structure of Ontario's Market Monitor

The MSP was established by the Board of Directors of the Independent Electricity Market Operator (now IESO), as required under the *Electricity Act, 1998*, in preparation for the opening of Ontario's wholesale market in 2002. The MSP was transferred to the OEB pursuant to the *Electricity Restructuring Act, 2004*.

[10] Investigation of Terms and Conditions of Public Utility Market-Based Rate Authorizations, 105 FERC ¶ 61,218 (2003) (Market Behaviour Rules Order), paragraph 1, Appendix A, where FERC clarified that the role of enforcement was its responsibility and that market monitors were to refer all potential compliance issues to it. In Ontario, the responsibility for market rule enforcement rests with the IESO's MACD, which has executed this role since market opening. The OEB also has the power to take remedial action or impose sanctions for non-compliance with the market rules. Alberta's Market Surveillance Administrator does perform the dual role of market monitoring and enforcement to a limited extent but, in this regard, it is distinct from the MSP and market monitors in the United States.

[11] Both the system operator and the market monitor share responsibility for the objectives of competition and economic efficiency. An important benefit of the sharing of responsibility is the focus placed by the market monitor on the impact on economic efficiency of the market design, rules, system operator programs and procedures, which otherwise tends to be subordinated to operational and reliability considerations, which are core responsibilities of the system operator.

The MSP consists of at least three qualified members appointed for fixed terms by the OEB, with one member being appointed as the MSP Chair. MSP members may not have a material interest in a market participant or be a director, officer, employee or agent of, among others, a market participant, the IESO or an affiliate of a market participant or the IESO.[12] A quorum for every meeting of the MSP consists of a majority of members, with a decision on a question facing the MSP requiring a majority of the votes cast on the question.

The MSP is assisted in its functions by the MAU, a ring-fenced division within the IESO's MACD. Upon the transfer of the MSP to the OEB, it was recognized that the MSP would continue to need the support of a full-time team of analysts to conduct day-to-day monitoring and other tasks under the direction of the MSP. Accordingly, the legislation contemplates that the MSP may use the services of IESO employees[13] and the Protocol between the IESO and the OEB governs this relationship. Under the terms of the Protocol, the MAU takes direction exclusively from the MSP in relation to matters falling within the MSP's mandate. The MAU is staffed with economists, engineers and market specialists who report within the IESO to the Vice-President of MACD on administrative matters. The MSP also receives legal and communications support from employees of the OEB.

2.3 The MSP's Mandate

The MSP's specific responsibilities are set out in By-law #2 and include:

- Monitoring, evaluating and analyzing activities related to the IESO-administered markets and market participant conduct (Article 4)
- Investigating activities related to the IESO-administered markets or market participant conduct (Article 5)
- Reviewing actual or potential flaws or inefficiencies identified as a result of its monitoring activities (Article 6)
- Reporting on the above activities, including reporting at least semi-annually (or as requested by the Chief Executive Officer (CEO) of the

[12] The restrictions are set out in Section 4.3.1(3) of the *Ontario Energy Board Act, 1998*, and section 2.1.4 of By-law #2.
[13] Section 4.3.1 (5) of the *Ontario Energy Board Act, 1998*.

OEB) on matters pertaining to its responsibilities and once annually on the MSP's general assessment of the state of the IESO-administered markets, including their efficiency and competitiveness (Article 7).

The MSP's mandate does not extend to an evaluation of the merits of government directives and policies in the abstract. To the extent that the MSP studies and reports on government policy, it is to contextualize its effects on the efficiency and competitiveness of the IESO-administered markets.

The following offers further information on how the MSP performs its responsibilities, all of which with the support of the MAU.

2.4 Monitoring

The MSP monitors the IESO-administered markets and market participant conduct for the following:

- Inappropriate or anomalous market conduct, including gaming or abuses of market power
- Activities of the IESO that have a detrimental impact on market efficiency or effective competition
- Flaws in the market rules, market design, procedures and the overall market structure, which result in outcomes that are inconsistent with the efficient and fair operation of a competitive market.

The MSP reports on its monitoring activities and provides an annual assessment of the state of the IESO-administered markets, which it now does through its annual *State of the Market* reports. The two *State of the Market* reports, and the 37 monitoring reports that preceded them, are available on the OEB's website. These reports are submitted to the CEO of the OEB, who in turn shares the report with the CEO of the IESO together with a request that the IESO advise on the actions it plans to take in response to any MSP recommendations contained in the report.[14] The MSP recommends remedial actions to mitigate conduct, flaws and inefficiencies

[14] As a condition of its licence, the IESO is also required to make an annual filing to the OEB with the status of actions taken by the IESO in response to outstanding MSP recommendations and, where no action has been taken, the rationale for not taking action. These annual filings are available on the IESO website.

identified through its monitoring activities, for the consideration of the OEB and the IESO.

As stated above and pursuant to By-law #2 and the Protocol, the MSP is responsible for monitoring, but from an operational perspective, the MAU supports the MSP and carries the primary responsibility for the day-to-day assessment of market data, IESO activities and market participant conduct. To do this, the MAU is expected to have the relevant in-depth expertise and to employ a wide range of analytic tools, models and performance metrics that support the MSP's monitoring requirements.

A key focus of the MAU is to identify, understand and explain market outcomes or conduct that they believe is potentially anomalous. The MSP defines anomalous to be market outcomes or market participant conduct that is inconsistent with expectations (particularly of a competitive and efficient market) or that falls outside of predicted patterns, trends or norms.

What the MSP considers as anomalous has evolved over time, as the markets have evolved and the understanding of the markets has grown. Through its work with the MSP and the ongoing assessment of the market, the MAU has and will continue to develop a keener understanding of the crucial factors influencing market outcomes. This understanding is a critical skill set when it comes to the measure of support that the MAU provides to the MSP.

The MAU reports to the MSP on their assessment activities and the identification of potentially anomalous market conduct or outcomes, at least monthly and more frequently as required. A summary of the key monitoring metrics used in the evaluation of anomalous market outcomes and market conduct under the legacy market design is provided below.

By-law #2 requires the MSP to monitor for inappropriate conduct, including gaming and abuses of market power.

The MSP defines gaming[15] as conduct involving four elements:

- A defect or gap in the market design, rules or procedures governing the IESO-administered markets (market defect)
- Exploitation of the market defect by a market participant
- Profit or benefit to the participant
- Expense or disadvantage to the market.[16]

A key evidentiary consideration in gaming is the economic intent for the conduct.[17] Conduct that is clearly inconsistent with efficient market behaviour or motivated by profit opportunities that are inconsistent with the economic fundamentals of supply and demand are indicia of possible manipulative gaming activity.

Market power, the exercise of market power, and the abuse of market power are standard concepts in the fields of economics and competition law.

Market power is the ability of a firm (or a group of firms) to restrict output to profitably raise and maintain prices above competitive price levels.[18] A firm may possess market power by virtue of its size, location, a unique cost or product advantage, or the presence of barriers to entry by competitors. A firm exercises market power when it acts on its ability by restricting output, thereby increasing market prices.

An abuse of market power entails an action (anti-competitive act) on the part of a firm (or a group of firms) that aims to impede or lessen the competitive response of one or more rival firms. Impeding or lessening the competitive

[15] By way of comparison, the Federal Energy Regulatory Commission has defined gaming to include "behavior that circumvents or takes unfair advantage of market rules or conditions in a deceptive manner that harms the proper functioning of the market and potentially other market participants or consumers." See Staff White Paper on Anti-Market Manipulation Enforcement Efforts Ten Years After EPACT 2005, page 23.

[16] See the MSP's Monitoring Document: Monitoring of Offers and Bids in the IESO-Administered Electricity Markets (March 2010), page 44.

[17] The MSP has noted that "an essential element of gaming related to a Market Defect is the exploitation of the opportunity" and that the MSP "considers that exploitation may exist where the market participant had some level of intention to exploit or knowledge of an opportunity to exploit arising from the Market Defect." See Report on an Investigation into Possible Gaming Behaviour Related to Infeasible Import Transactions Offered by West Oaks NY/NE, LP on the Manitoba-Ontario Intertie (Oct 2012) page 19.

[18] The competitive price level is the price that would prevail in equilibrium in an idealized perfectly competitive market. Under perfect competition, the price at which the market clears is equal to the short-run marginal cost of the marginal supplier and is at least as great as the marginal supplier's average variable cost.

response increases or preserves the ability of the firm(s) to exercise market power. Exclusionary practices, collusion (bid rigging, price fixing, agreements to withhold capacity, etc.) and predatory pricing (pricing below marginal cost to drive out or discipline competition) are classic examples of anti-competitive activity that could constitute an abuse of market power if engaged in by a firm (or multiple firms) that has (or collectively have) market power.

Possessing or exercising market power itself is not objectionable under Canadian competition law.[19] For example, market power obtained because of a superior product, business acumen or historic accident, is not, by itself, objectionable. However, abusing market power to substantially lessen competition is objectionable.

In the context of the IESO-administered markets, the MSP monitors for both the exercise of market power and the abuse of market power. Its approach to the exercise or abuse of market power is informed by the fields of economics and Canadian competition law.

A market participant may possess market power by virtue of its share of generation capacity, its location on a congested transmission grid, or its cost structure and relative positioning on the energy offer curve. A market participant that possesses market power may exercise this power in two ways:

- Economic withholding:[20] This is defined as a decision by a market participant to offer generation capacity into the market but at a price that exceeds the short-run marginal cost of the capacity and exceeds the market clearing price.
- Physical withholding: This is defined as a decision by a market participant not to offer available generation capacity into the market when the short-run marginal cost of the capacity is less than or equal to the competitive market price.

[19] Abuse of Dominance Enforcement Guidelines, Canadian Competition Bureau, 2019.
[20] A variant of economic withholding is pricing up. Pricing up refers to a situation in which the marginal supplier raises its offer price above its short-run marginal cost, but just below the offer price of the next supplier. Pricing up results in a wealth transfer from all consumers to all suppliers in the market at the time. However, it does not necessarily lead to inefficient dispatch.

In both cases, the market participant effectively restricts its output to affect the market clearing price. Withholding (economic or physical) creates an artificial scarcity in the market. Withholding leads to a higher market price and thus to a wealth transfer from all consumers to all suppliers in the market during the affected period. It also results in inefficient dispatch when higher-cost sources of energy are called to market before lower-cost resources. To the extent that consumers respond to a price that (due to withholding) is above marginal cost by substituting to other forms of energy or by foregoing otherwise productive activities, this results in inefficient consumption decisions.[21]

The MSP monitors for evidence of the exercise of market power (withholding) as part of its evaluation of the overall efficiency of the IESO-administered markets. The MSP further monitors for the exercise of market power to determine whether corrective competitive responses are being impeded by market structure, rules or procedures or other barriers. This could lead to recommendations that the market rules or aspects of market design or overall structure be changed. [22]

The MSP applies a three-part test to identify a potential exercise of market power that consists of a Conduct Test, a Material Price Impact Test and a Profitability Test.[23] The Conduct Test examines the behaviour of market participants, to assess if they are engaged in withholding (economic or physical) or pricing up. The Material Price Impact Test assesses whether the conduct of a particular participant had a significant impact on the market price, raising it substantially. The Profitability Test analyzes whether the participant's conduct benefited the participant through increased profits. In conducting the Profitability Test, the MSP considers the effects of a

[21] Under the legacy market design, a market participant may, under certain market conditions, have had the ability to increase its Congestion Management Settlement Credit payments by offering supply at a price above or below its actual short-run marginal cost. This was called Local Market Power, and the IESO had responsibility over Local Market Power as was set out in Appendix 7.6 of the IESO's legacy market rules. While Section 1.8.1 of that Appendix 7.6 contemplated an MSP investigation or inquiry pursuant to the Appendix, no registered market participant could as a result of such activity, analysis or investigation, be subject to the imposition of any financial sanction by the IESO other than the revision of a settlement credit effected in accordance with Appendix 7.6.

[22] The exercise of market power may be reviewable by the IESO's MACD group and subject to remedial action.

[23] Monitoring Document: Monitoring of Offers and Bids in the IESO-Administered Electricity Markets, Market Surveillance Panel, March 2010.

participant's contract with the IESO or the regulated payment amounts in the case of Ontario Power Generation (OPG).

Furthermore, the MSP's identification of the persistent exercise of market power by a market participant may be the starting point for the assessment or investigation of a potential abuse of market power (i.e., to determine if the ability to exercise market power was achieved or enhanced by an anti-competitive act).

Under the renewed market, the IESO has implemented a new market power mitigation framework. Section 3 provides further information on the IESO's new framework and offers insights into the MSP's role under this framework.

2.4.1 Competition and Efficiency Analysis

A central focus of the MSP is to monitor for features of the IESO-administered markets that adversely affect the competitiveness of the markets and market efficiency. Competition and efficiency are fundamental principles in economics, indicating how well resources are allocated and how well businesses operate in a market. The MSP draws on these economic principles in its assessment of the IESO-administered markets.

Competition can be defined as a rivalry where two or more parties strive for a common outcome (consumer purchases) that cannot be shared. The competitiveness of a market is generally assessed according to the following factors:

- Number of sellers and buyers: Consumers have greater choice the more sellers there are in a market, which fosters greater competition between the sellers to win over consumer choice. Similarly, sellers have more options when there are more buyers in a market, which makes their business more viable.
- Ease of entry: Low barriers to entry, including low start-up capital costs and minimal regulations, can encourage new sellers to join a market, which in turn puts competitive pressure on the existing firms in a market.

- Information availability and transparency: When all buyers and sellers have complete and accurate information on the market conditions affecting product availability and current and future prices, they can make more informed choices, leading to greater competition. If one seller has better information on key market conditions, they are more likely to exploit this knowledge to their advantage and at the expense of others, which reduces the trust in the market and the willingness to consume or sell in the market.
- Product differentiation: When the sellers' products are similar, meaning consumers view one seller's product to be a good substitute for the products of all other sellers, consumers have greater choice, and sellers must compete more vigorously for consumer choice.

When these factors align with those of a more competitive structure, buyers and sellers have no, or at least minimal ability, to control market prices, and the prevailing market prices tend to reflect the marginal cost of production (i.e., there is an absence of market power). In this regard, the competitiveness of a market can be assessed in terms of evidence of the absence of a significant and sustained exercise of market power.

Competitive markets promote market efficiency, whereby supply is drawn from the lowest cost sellers at any point in time and the output is allocated to those with the highest valued uses. Over time, consumption from more efficient sources of supply and from superior new technologies drives out the less efficient sources. In an efficient market, the collective welfare of consumers and suppliers is maximized.

There are certain technical features of the electricity industry that makes electricity markets different from general economy "free markets."[24] These technical features have implications for the emergence and operation of

[24] See *Making Competition Work in Electricity*, Sally Hunt, New York Wiley, 2002, page 29. In particular:
- The flow of electricity must respect the physical laws governing the electricity network (frequency, voltage, stability), and supply and demand must always be in balance;
- Electricity is difficult to store (economically), particularly by end-use consumers;
- Real-time demand is very inelastic (i.e., does not respond to prices), however demand can change rapidly hour to hour;
- Electricity must be available on demand with "just-in time" production; and
- Random real-time failures in generation/transmission equipment that can disrupt the stability of the grid are possible.

competitive electricity markets. Whereas general economy markets can emerge and function with minimal or occasional regulatory oversight, electricity markets require constant oversight by a designated regulator (i.e., a system and market operator). Electricity markets do not emerge autonomously. Instead, they are regulatory constructions, designed by system operators, academics and stakeholders, and approved by regulators or government. They require market rules and system operator procedures to govern the buying and selling of electricity and to define the roles of participants, how electricity is priced and how the system is operated.

Ontario's wholesale electricity market is particularly unique. Ontario's market is a hybrid market that combines a competitive wholesale market with long-term planning and IESO procurement contracts. It also includes a provincially owned, rate-regulated generator that controls roughly 51 per cent of the province's generation capacity.

The market rules, IESO procedures and contracts influence (often intentionally) the decisions of electricity market participants; they affect how competition among participants occurs. The MSP must account for these influences when assessing the competitiveness of the IESO-administered markets. In particular, the MSP considers the extent to which the rules, procedures and contracts induce a participant to behave (i.e., bid or offer) as if it was competing in a perfectly competitive market (i.e., bidding or offering in a manner that reflects its true value of consumption or its marginal cost of generating). Assessing competitiveness in this manner puts the emphasis on the ultimate outcome of a competitive market, which is economic efficiency.

In electricity markets, economic efficiency is often discussed in terms of dispatch, consumption and investment efficiency. Dispatch efficiency (productive efficiency) occurs when electricity demand is supplied moment-by-moment by the lowest cost available generation sources. Consumption efficiency (allocative efficiency) occurs when only consumers that value electricity consumption equal to or more than the system marginal cost consume, and those that value electricity consumption less than system marginal cost do not consume.[25]

[25] The system marginal cost is the cost to produce one more unit of electricity at a point in time and at a specific location on the grid.

Dispatch and consumption efficiency are short-run measures of efficiency. In the short-run, generator, consumer and transmitter decisions are made based on the existing stock of assets (i.e., consumer devices and total generation capacity, along with transmission capacity). In response to market conditions, these participants seek to do the best they can, given the fixed stock of assets. In contrast, in the long-run, participants can change the stock of assets, selecting new assets or retiring old assets. Investment efficiency occurs when participants, over the long-run, invest in assets in a manner that ensures that industry resources are allocated in a way that maximizes overall societal benefit over time (i.e., promote dispatch and consumption efficiency over time).

In Ontario's hybrid market, investment decisions are largely influenced by central planning and government procurement directives. However, short-run prices can inform investment. The MSP's observations in support of short-run efficiencies and efficient pricing, therefore, supports long-run efficiency. Where competitive procurements (including the IESO Capacity Auctions) are used, the MSP assesses the competitiveness of the design and structure of the procurements, and the incentive effects of the contracts or financial arrangements for inducing competitive behaviour in the IESO-administered markets. The MSP believes that a competitive process should be the default procurement approach, barring other non-efficiency objectives.

2.4.2 Examples of Monitoring Indicia

The following offers a sample of key indicia used to monitor and identify anomalous market outcomes and anomalous or inappropriate conduct, and to assess the competitiveness and efficiency of the markets under the legacy market design. The MSP will continue to use several of these indicia to monitor the renewed markets. This summary is intended to offer the reader a sense of the monitoring activities of the MAU and the MSP over the past 20 years. Section 3 provides information on additional data series and indicia that the MSP will employ for the monitoring of the renewed markets.

2.4.2.1 Energy Market Prices and Price Movements

The energy market clearing price is the consequence of all market actions. An evaluation of the causes of an energy market price and energy price movements over time is therefore a reasonable starting point for identifying

potential anomalous or inappropriate market conduct, and features of the market that may adversely affect competition or market efficiency.

The evaluation typically involves a consideration of whether an energy clearing price or energy price movements over time can reasonably be explained by the fundamentals of supply and demand and an effectively competitive market. This assessment may be performed manually, by reviewing changes in five-minute or hourly supply-and-demand data,[26] or more systematically by using historic data and statistical relationships to identify and assess price outcomes that fall outside standard statistical confidence intervals. In either case, if it is determined that a certain clearing price or price movements cannot be readily explained by standard competitive supply and demand factors, a more detailed assessment of specific factors is conducted.

Under the legacy market design, the MSP used indicia such as hourly prices above the marginal cost of the highest cost fossil generation facility as a potential anomalous hourly price for further study.[27] The MSP has also monitored longer-term (daily, monthly, seasonal, annual) price trends using statistical measures of deviations from statistical norms (i.e., confidence intervals) to identify potential anomalous prices for further study.

As will be discussed in Section 3, the shift from a uniform energy market clearing price to a system of locational marginal prices, zonal prices and an Ontario Zonal Price for non-dispatchable loads will change the mechanics by which pricing indicia are monitored but not the general approach.

2.4.2.2 Offered Cost vs. Estimated Cost

A standard metric used by market monitors, including the MSP, is a comparison of offer prices (offered costs) and estimated costs. Supply offered at prices above estimates of short-run marginal cost may be an

[26] Supply factors can include fuel availability for hydroelectric, wind and solar generation, natural gas prices, nuclear generation availability, generation outages (planned and forced) and import availability. They can also include a consideration of transmission limits. Demand factors include dispatchable and non-dispatchable demand and factors that influence that demand, including weather and export availability. Pre-dispatch forecasts and scheduling decisions are also considered as affecting supply-and-demand factors that in turn affect real-time prices.
[27] In its first report in 2002, the MSP selected $200/MWh to define an anomalous price, as this price was well over three times the average Hourly Ontario Energy Price at that time and above the incremental cost of the highest cost fossil generating unit in the province. See Market Surveillance Panel Monitoring Report On The IMO-Administered Electricity Markets for The First Four Months May- August 2002, October 2, 2002, page 70.

indication of a possible exercise of market power, an abuse of market power or gaming, all of which may contribute to inefficient market outcomes. Supply offered at prices above or below short-run marginal cost may also be an indication that the market design, rules, IESO contracts or other market factors are distorting the incentives for suppliers to offer competitively and efficiently, which may point to possible flaws in these market structures.

The MSP recognizes there are several practical issues to be addressed in the estimation of marginal cost. Marginal cost estimates derived from engineering studies can fail to properly account for a supplier's competitive considerations related to its need to recover average incremental cost and opportunity cost. Cost estimates inferred from past offer behaviour may also fail to capture incremental cost and opportunity cost.

Under the market rules of the renewed markets, market participants are required to submit to the IESO information on production costs, unit characteristics and opportunity costs as part of the market power mitigation framework. This new information will assist the MSP in its assessment of marginal cost.

2.4.2.3 Congestion Management Settlement Credit Payments

Congestion Management Settlement Credit payments (CMSCs) were a key feature of the legacy two-schedule market design that prevailed until implementation of the renewed markets. Like energy prices, they are a consequence of market actions. Various thresholds have been used in the past to triage, for further review, instances of high individual CMSCs paid to a market participant or periods of high CMSCs paid in the market. High CMSCs may have been an indication of the presence of local market power or gaming. They may also have been an indication of flaws in the overall structure (limited transmission infrastructure, flaws in the generation or transmission outage planning process or other market design flaws).

The MSP has monitored for large CMSCs in the overall market, in certain electrical zones or paid to individual market participants, on an hourly, daily and seasonal basis, as triggers for further study of potential flaws in the market or inappropriate conduct. CMSCs were eliminated with the implementation of the renewed markets, with the effects of congestion being

reflected in locational marginal prices or Make-Whole Payments. Section 3 discusses how the MSP's monitoring will be affected by this shift.

2.4.2.4 Marginal Unit Analysis

Marginal unit analysis identifies the cost of the resource that would be dispatched to meet the next increment of demand (i.e., the marginal unit). Marginal unit analysis can be important for understanding how prices are set and the efficacy of the price-setting process. In the renewed market, with locational marginal pricing, the MSP will consider identifying the marginal units for each location and within each pricing zone.

2.4.2.5 Structural Measures of Competition

The MSP will continue to apply measures to assess the competitive structure of the electricity market. Some of these are commonly used to assess market concentration and competition in industries other than the electricity sector. These measures were applicable in the legacy market and will continue to be applicable in the renewed market. Other measures are more unique to the electricity sector. Structural measures used by the MSP include:

- Herfindahl-Hirschman Index (HHI): The HHI is a standard tool used to characterize the concentration of market share in various industries.[28] In the context of the Ontario electricity market, the MSP routinely applies the HHI to evaluate the concentration of control over generation assets – both at a provincewide scale and within each of the major transmission zones that comprise the electricity system. In a zonal context, HHI values are an initial indicator of where within the electricity system there may be a greater likelihood or frequency of the exercise of local market power.
- Residual Supplier Index (RSI): The RSI is a metric used to assess market competitiveness and market power in electricity markets. It is calculated as the ratio of total market supply capacity (excluding a specific market participant's capacity) to the market demand at a specific time and in a specific location. The RSI provides a measure of

[28] The HHI is calculated by squaring the market share of each firm in a market, summing the resulting numbers and then interpreting the total as an indicator of market concentration. A higher HHI indicates a more concentrated and possibly less competitive market while a lower HHI suggests a less concentrated and possibly a more competitive market.

the importance of the excluded market participant's production for meeting market demand. The lower the RSI value, the less likely the market is competitive and the more likely the market participant can influence the market price above the competitive price level. An RSI score of less than one indicates that market demand cannot be satisfied without the production of the market participant (i.e., the market participant's production is "pivotal" for serving demand and it has the ability to significantly influence the price upward above the system marginal cost). The MSP has applied the RSI at a provincewide scale and within each of the major transmission zones that comprise the electricity system.

- Regulatory measures: Since the commencement of Ontario's electricity market, certain legacy generation assets controlled by OPG and its subsidiaries have been subject to measures that influence OPG's operations in the IESO-administered markets. These measures are somewhat unique to the Ontario market. The MSP regularly considers these measures when monitoring the markets to assess OPG's incentives to offer efficiently.
- Contractual measures*:* Most of the generation and storage facilities, and some load facilities, in Ontario are under contract with the IESO. The terms of these IESO contracts can influence how owners of these facilities operate in the IESO-administered markets. The MSP regularly considers contractual terms when monitoring the markets to assess the terms that affect the incentives for these participants to offer or bid efficiently.

2.4.2.6 Efficiency Assessments

To assess the potential inefficiency that may result from flaws in market design, market rules and procedures, and overall structure (market flaws) or inappropriate conduct, the MSP applies a "but-for" analysis. This analysis was applicable in the legacy market and will continue to be applicable in the renewed markets. A "but-for"" analysis is used to determine if a specific event or outcome would have occurred without the presence of a particular factor or action. In the context of the electricity market, the MSP's "but-for" analysis compares actual observed market outcomes to the outcomes expected to prevail absent the market flaw or conduct:

- Dispatch efficiency: To assess the dispatch efficiency of a market feature of participant conduct, the MSP compares the actual production cost incurred to meet demand over a review period when the feature or conduct was present (i.e., five-minute interval, hourly as the sum of the 12 five-minute intervals, multi-hourly, daily, monthly, etc.), to an estimate of the production cost that would have been incurred "but-for" the market feature or conduct. This analysis generally requires consideration of how market participants, the IESO or other affected parties would have responded (offered, bid, etc.) had the market feature or conduct not been present. The difference between that actual production cost versus the estimated but-for production cost represents the efficiency loss (if positive) or the efficiency gain (if negative).
- Consumption efficiency: To assess consumption efficiency, the MSP compares the actual amount of electricity consumption that occurred under the market feature or conduct over the review period, to an estimate of the amount of electricity that would have been consumed "but-for" the market feature or conduct. The area below an estimate of the electricity demand curve between the actual consumption amount and the estimated but-for consumption amount represents the efficiency loss.
- Investment efficiency: Investment efficiency is often assessed with reference to long-run marginal cost.[29] Long-run marginal cost represents the cost of producing an additional unit of electricity in the long run, and market prices should ideally reflect these costs. The MSP has frequently noted that long-run investment efficiency is achieved when the industry's long-term average cost is minimized and price equals marginal cost, promoting efficient resource allocation.

2.5 Investigations

Section 37 of the *Electricity Act, 1998,* provides the MSP with the powers to investigate any activity related to the IESO-administered markets or the

[29] For example, see A Comparison of the Long-Run Marginal Cost and Price of Electricity in Alberta: An assessment undertaken as part of the 2012 State of the Market report, Market Surveillance Administrator, December 10, 2012.

conduct of a market participant. Section 5.1.1 of By-law #2 further provides that the MSP may commence an investigation:

- Where it considers such investigation is warranted as a result of its monitoring activities
- At the request of the CEO of the OEB
- Upon receipt of a complaint or referral from any person other than the CEO, or any board, agency or tribunal.

The MSP has broad discretion in establishing the scope of an investigation, determining whether to commence or terminate an investigation in appropriate cases and making findings regarding the activity or conduct in question. A person under investigation has a right to be notified (unless it would prejudice the investigation) and to have an opportunity to respond where the MSP intends to make a finding that the person has engaged in inappropriate or anomalous conduct. The CEO of the OEB is required to be kept informed of the progress of, and all major steps taken during, an investigation.

For the purposes of an investigation, the MSP has the power to examine any documents or other things, whether they are in the possession or control of the person whose activities are being investigated or any other person. The MSP also has the same power to summon and enforce the attendance of any person and to compel them to testify on oath or otherwise, and to summon and compel any person to produce documents and other things, as is vested in the Superior Court of Justice for the trial of civil actions. The MSP may also conduct on-site inspections and apply for a warrant authorizing search and seizure.

The output of an investigation is a report that is provided to the OEB and to the IESO. With notice to the CEO of the OEB, the MSP may also send the report to any other person the MSP considers appropriate, as may the CEO of the OEB. Investigation reports are made public on the OEB's website (subject to redactions for confidentiality). Upon receipt of an investigation report that contains recommendations relating to the abuse or possible abuse of market power, the IESO must inform the OEB about actions that it has taken or intends to take in response to the report. The OEB may conduct a

review to determine whether the market rules or licence of any market participant should be amended.

The MSP does not have powers to take remedial actions or impose sanctions on market participants or the IESO as part of its investigation powers; it only has the power to make recommendations. The powers to take remedial action or impose sanctions rest with the OEB and MACD.

Since market opening, the MSP has conducted seven investigations: two investigations on its own initiative stemming from its monitoring of market participant conduct; three investigations at the request of the CEO of the OEB; and two based on a referral from a third party. The MSP received a third referral but determined upon review of the circumstances in the case not to commence an investigation.

2.6 Reviews

Section 6.1.1 of By-law #2 provides that the MSP, with prior concurrence from the CEO of the OEB, may undertake a review of actual or potential design flaws or inefficiencies in the market rules and procedures of the IESO, or of design or other flaws in the overall structure of the IESO-administered markets, as identified through its monitoring activities. The MSP must prepare and deliver a report on its review to the CEO of the OEB, with information on the matter reviewed, the manner in which the matter came to the MSP's attention, the MSP's findings and any MSP recommendations with reasons. The CEO of the OEB must provide the report to the IESO and to other persons the CEO considers appropriate, and the report must be posted on the OEB's website, subject to the redaction of confidential information.

3 MONITORING OF THE RENEWED IESO-ADMINISTERED MARKETS

3.1 The IESO's Market Renewal Program

The IESO's established mission for the MRP is to "deliver a more efficient, stable marketplace with competitive and transparent mechanisms that meet system and participant needs at lowest cost."[30]

To deliver on its mission, MRP is intended to:[31]

- "Replace the two-schedule market with a single-schedule market (SSM) that will address current misalignments between price and dispatch, eliminating the need for unnecessary out-of-market payments.
- Introduce a day-ahead market (DAM) that will provide greater operational certainty to the IESO and greater financial certainty to market participants, which lowers the cost of producing electricity and ensures we commit only the resources required to meet system needs.
- Reduce the cost of scheduling and dispatching resources to meet demand as it changes from the day-ahead to real-time through the enhanced real-time unit commitment (ERUC) initiative." [32]

In addition, the IESO has introduced a new market power mitigation framework to address the potential for suppliers to exercise market power in the energy and operating reserve markets.[33]

The following provides a high-level synopsis of the key design differences between the legacy markets and the renewed markets.

[30] Market Renewal Mission and Principles, accessed on March 24, 2025.
[31] What is the Market Renewal Program? (ieso.ca).
[32] Single Schedule High-Level Design, August 2019.
[33] Market Renewal Program: Energy, Market Power Mitigation, Detailed Design, Issue 2.0.

3.1.1 Two-Schedule vs. Single-Schedule System[34]

The legacy market design used two separate schedules: one for determining dispatch instructions and another for determining a uniform Ontario price used for settlement. The IESO acknowledged that the two-schedule system had a "misalignment between price and dispatch,"[35] leading to inefficiencies and the need for complex out-of-market payments.

In the renewed markets, the IESO uses a single schedule to determine both dispatch instructions and prices, which the IESO expects will improve the alignment of price and dispatch.

The SSM introduces locational marginal prices (LMP) for dispatchable market participants. LMPs are designed to reflect the as-offered cost (or bid price) of producing and consuming one more megawatt of electricity at a specific location at a point in time. Each LMP is calculated to include three components:

- The energy reference price: The cost of increasing the demand for electricity by one megawatt at the "reference location," the Richview Transformer Station located in the Greater Toronto Area.
- The energy price congestion: The component that is the incremental cost at any location on the grid due to transmission congestion between that location and the reference location (which may be positive or negative).
- The energy price loss component. This reflects the cost of marginal transmission losses at a given location relative to the reference location.[36]

Under the SSM, differences in real-time LMPs at different locations can vary based on congestion and losses relative to the reference location.

Non-dispatchable loads, including local distribution companies, are settled in the SSM using the Day-Ahead Ontario Zonal Price (OZP) plus a price adjustment called the Load Forecast Deviation Adjustment (LFDA). The OZP

[34] Single Schedule High-Level Design, August 2019.
[35] Ibid. page 7.
[36] Paraphrased from IESO, *Single Schedule Market High-Level Design.*

is the summation of the reference price plus the load-weighted averages of the loss and congestion components of LMPs at non-dispatchable load locations, effectively spreading the cost of serving these loads across all non-dispatchable loads.[37]

By aligning price and dispatch, the SSM aims to reduce the need for unnecessary out-of-market payments.[38] Furthermore, the SSM has enabled the IESO to implement other initiatives, including the day-ahead market.

3.1.2 Legacy Day-Ahead Commitment Process vs. Day-Ahead Market[39]

The key difference between the IESO's legacy day-ahead commitment process (DACP) and the new DAM is that the DAM is a financially binding market open to all market participant classes, while the DACP was not.

Under the legacy DACP, certain dispatchable facilities, namely non-quick-start generators and importers, that were eligible for a production cost guarantee could receive a commitment schedule one day ahead. If they met that schedule in real time, they were kept financially whole to their day-ahead offer. Other generators, dispatchable loads and exporters were not eligible for guarantees. The DACP aimed to provide a dependable view of the next day's available supply and anticipated demand for eligible participants and the IESO.

The IESO has acknowledged that the legacy DACP had several shortcomings. The inability to obtain a financially binding price reduced the incentives for exports, dispatchable loads and quick-start generators to participate fully or efficiently in the DACP. Instead, these resources made decisions on participating in the real-time markets based on real-time price expectations. The IESO noted that "failure of resources to participate fully or efficiently in the DACP results in an incomplete view of the next day's demand and supply, diminishing the IESO's ability to schedule and commit the lowest-cost set of resources to meet the next day's demand."[40]

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[37] Ref. IESO, Renewed Market Rules, Chapter 0.9 section 3.2, and Chapter 0.7 Appendices, sections 11.3.3.2, 16.3.3.2, and 23.3.3.3.
[38] IESO, Single Schedule Market High-Level Design, page 13.
[39] Day-Ahead Market High-Level Design, August 2019.
[40] Day-Ahead Market High-Level Design, August 2019, page 4.

The IESO's DAM features a new DAM calculation engine,[41] financially binding prices, and a process where market participants submit bids and offers a day in advance, which the IESO expects will lead to better resource planning and improved scheduling efficiency.

The DAM calculation engine runs on the pre-dispatch day and produces schedules and locational marginal prices for every hour of the dispatch day, resulting in financially binding prices. The DAM calculation engine uses new inputs from market participants. This includes dependencies between different hydroelectric resources on a cascade river system, the minimum level of output to which a hydroelectric resource can be scheduled, and new inputs specifying the number of hours it takes for a non-quick start resource to reach minimum loading point.[42]

New IESO data inputs are also utilized by the DAM calculation engine, including an enhanced network model providing pricing locations for all delivery points associated with dispatchable generation facilities, dispatchable loads, non-dispatchable generation facilities, non-dispatchable loads and price responsive loads, and new demand forecasts produced as the sum of four separate area demand forecasts to better reflect localized weather conditions and consumption patterns for each area.[43]

The DAM also permits participation by virtual traders, which are market participants who submit financial bids and offers for energy, like physical resources, but without physically withdrawing energy from or injecting it into the grid. Virtual trading is intended to improve participation and competition in the DAM, and to bring price convergence between day-ahead and real-time pricing.

[41] Under "The Renewed Market Rules for the Ontario Electricity Market," the day-ahead market calculation engine means an algorithm that consists of three passes, where each pass executes one or more optimization problems solved by the IESO to determine schedules and prices in accordance with MR Ch.7 App.7.5 to meet the needs of the day-ahead market. The renewed market rules provide similar definitions for the pre-dispatch and real-time calculations.
[42] Paraphrased from, IESO, Market Renewal Program: Energy Day-Ahead Market Calculation Engine Detailed Design, Issue 2.0, page 8.
[43] Ibid.

3.1.3 Legacy Unit Commitment vs. Enhanced Real-time Unit Commitment [44]

Unlike the previous pre-dispatch and unit commitment processes, the ERUC aims to "improve the efficiency of unit commitments"[45] in the intra-day timeframe by optimizing over multiple hours and considering all resource costs, unlike the legacy pre-dispatch and unit commitment processes.

The legacy unit commitment process solved each hour independently, potentially leading to suboptimal decisions across multiple hours. It did not fully account for or optimize all relevant costs, including fixed start-up costs and speed-no-load costs of non-quick-start resources, in commitment decisions.

The IESO expects the ERUC will improve competition and produce more efficient market outcomes, facilitate the scheduling of the lowest-cost resources to meet reliability needs in real time and address issues arising from enforcing DAM requirements, particularly for non-quick-start resources.[46]

3.1.4 Market Power Mitigation Framework[47]

The IESO has introduced a new market power mitigation (MPM) framework to address the potential for suppliers to exercise market power in the energy and operating reserve markets. The IESO's purpose for implementing the MPM framework is to prevent electricity suppliers from exerting undue influence on market prices due to their location on the transmission grid, ensuring a more efficient and competitive electricity market.[48] The new MPM framework consists of:

- An ex-ante (before-the-fact) approach to market power mitigation to be applied in the day-ahead, pre-dispatch and real-time scheduling

[44] See IESO, Enhanced Real-time Commitment High-Level Design.
[45] See IESO, Enhanced Real-time Commitment High-Level Design, page 54.
[46] Ibid. page 5.
[47] Market Manual 14: Market Power Mitigation Part 14.1: Market Power Mitigation Procedures, Issue 7.0 June 7, 2024, accessed on March 24, 2025.
[48] Market Manual 14: Market Power Mitigation Part 14.1: Market Power Mitigation Procedures, Issue 4.0 September 9, 2022, accessed on March 24, 2025. The MPM framework includes a conduct and price impact test that is like the MSP's tests. The IESO's MPM framework does not include a profitability test or consider the extent to which contracts or regulation could be a mitigating circumstance for the conduct.

processes. This is intended to "…address situations where market power could affect dispatch schedules and prices in the energy and operating reserve markets" [49]

- An ex-ante settlement mitigation process to address situations where market power could impact the settlement of Make-Whole Payments (see 3.2.3 below for a discussion of these payments)
- An ex-post (after-the-fact) mitigation of market power to "…alleviate the effects of physical withholding…"[50] and the effects of economic withholding on uncompetitive interties.[51]

3.2 Monitoring the Renewed IESO-Administered Markets

The MSP's mandate, to monitor the IESO-administered markets for anomalous market outcomes, anomalous or inappropriate market participant conduct, market flaws or IESO activities that impact or are inconsistent with the efficient and fair operation of a competitive market, carries forward in the renewed markets. However, the various changes made to the IESO-administered markets through MRP have required the MSP to incorporate new indicia and tools to monitor the renewed markets. The following provides a sample of the additional data series, indicia and analytic tools that the MSP will employ in monitoring the renewed markets. As noted in Section 2, some of the indicia and tools used in monitoring the legacy markets will remain relevant in the renewed markets.

3.2.1 Locational Marginal Prices and Zonal Prices

Under the renewed markets, DAM, pre-dispatch and real-time prices shift from unconstrained, Ontario-wide prices to locational marginal prices (LMPs) and zonal prices which are variously applicable to different classes of market participants. The MSP will continue to use indicia such as the cost of the highest cost peaking natural gas generators as an initial screen to trigger study of potentially anomalous LMPs. The MSP will use different statistical models of individual LMP trends to identify price trends that fall outside of statistical norms. Additionally, the MSP is exploring new statistical modeling

[49] IESO, Market Renewal Program: Energy - Market Power Mitigation Detailed Design, Issue 2.0, page 7.
[50] Ibid.
[51] Ibid.

to compare sets of LMPs and zonal prices, on an hourly basis and across different time frames, to assess potentially anomalous LMP differences that are not readily explained by losses or congestion. This type of monitoring analysis will replace the monitoring of legacy CMSCs to assess potential market flaws or inappropriate conduct not explained by grid conditions.

In the renewed markets, the IESO uses new reserve shortage penalty prices to address constraint violations, including: a maximum operating reserve area penalty price, a penalty price for 30-minute operating reserve and an area minimum operating reserve penalty price.[52] The IESO uses reserve shortage penalty prices to ensure that day-ahead, pre-dispatch and real-time calculation engines respect mandatory reserve requirements and that prices signal those requirements, and to encourage market participants to meet reliability obligations. Other penalty prices influence the calculation engines to avoid scheduling solutions that violate other physical constraints including transmission security constraints, daily energy limits of facilities and overall energy balance.[53] Most penalty prices used are all greater than the maximum market clearing price and are not used for market settlement. When an LMP is inflated above the maximum market clearing price for scheduling purposes, as a result of a penalty price violation, it is adjusted to a “settlement ceiling price.”[54] Conversely, if an LMP is depressed below a defined “settlement floor price” (e.g. due to energy imbalance during over-generation conditions), it will be adjusted to that floor price for settlement purposes.[55] The MSP will review all outcomes when the reserve shortage penalty prices are applied to identify the causes for the shortages and potential anomalies in market design or inappropriate conduct used to drive up prices.

3.2.2 Internal Congestion Rents

Congestion rents occur when binding transmission constraints create price differences (i.e., differences in LMPs). When a transmission constraint is binding, lower-priced supply on one side of the constraint cannot fully serve demand on the other side. This demand must be served by higher-priced

[52] IESO Market Manual 4: Market Operations Part 0.4.3: Operation of the Real-Time Market, Issue 1.0 November 11, 2024.
[53] Ibid.
[54] IESO renewed Market Rules, Appendix 7.5, section 23.3.1.4.
[55] Ibid.

supply on the demand side of the constraint. When this occurs under the renewed markets, consumers will be charged the higher LMP for all their demand. However, suppliers dispatched on the lower-priced side of the constraint to supply part of the demand will receive the lower LMP. The difference between the higher amount paid by consumers and the lower amount paid to suppliers is called a congestion rent. The IESO will collect internal congestion rents and return them to Ontario consumers monthly, proportional to their consumption.[56]

Internal congestion rents provide information on the potential economic benefit from new investment in internal transmission. The MSP will monitor and report on this information as it relates to the overall efficiency and competitiveness of the IESO-administered markets.

3.2.3 Make-Whole Payments

Make-Whole Payments (MWPs) are a financial mechanism to encourage market participants to follow their dispatch instructions, even if doing so leads to higher participant costs or lost opportunities, by ensuring they are financially "made whole." MRP will introduce both day-ahead MWPs for resources scheduled in the DAM, along with real-time MWPs for resources following their dispatch instructions under ERUC and in the real-time markets. As noted in Section 2, CMSC payments, which were intended to encourage participants to follow dispatch under a two-schedule system in the face of transmission constraints, will be eliminated and replaced by LMPs, which embed the cost of congestion, and MWPs, which will provide compensatory payments for incremental costs incurred or lost opportunity costs when the IESO dispatches resources out-of-merit to manage congestion or reliability-related issues.

Like the MSP's monitoring of CMSCs in the legacy market, the MSP will monitor large MWP amounts in the overall market and in certain electrical zones, as well as MWPs paid to individual market participants or in respect of specific facilities, on an hourly, daily and seasonal basis, as triggers for further study of potential flaws in the market or anomalous or inappropriate conduct.

[56] Single Schedule High-Level Design, August 2019, accessed on March 24, 2025.

To monitor the overall MWPs for potential anomalies, the MSP will calculate on a daily, monthly and annual basis for both DAM and real-time, the following indicia:

> *MWP Anomaly Index* = MWP ÷ (Resource Revenues + MWP) x 100.
>
> This index compares the level of MWP to the resource revenues plus MWPs, putting the level of MWPs in perspective relative to resource margins. This metric will tend to filter out changes in the level of MWPs due to variations in fuel costs and as well as those due to the frequency with which particular types of units are committed, to better identify potential anomalies and changes in behaviour.

The MSP will pay particular attention to MWPs made because of unit commitments in both the DAM and ERUC, and units committed or dispatched out-of-market by IESO control room operator actions. MRP is intended to improve the representation of facilities' operational characteristics and parameters in the day-ahead, pre-dispatch and real-time calculation engines, and the resulting price signals. MWPs made due to operator actions may be an indication of potential limitations in MRP design or physical realities not modeled in the calculation engine or submitted dispatch data. This information can also be used to do ex-post assessments of the need for and efficacy of out-of-market IESO control room operator actions.

The MSP will monitor frequent or large MWPs made to specific market participants or traders, or in respect of specific facilities or import or export transactions, to assess the causes of the payments including potential design flaws or inappropriate conduct

3.2.4 Operating Characteristics and Parameters

In the renewed markets, non-quick-start generation facilities, hydroelectric facilities and variable generation facilities, will be required to submit new (additional) data on operating characteristics and parameters. This new data will be used in the day-ahead and real-time calculation engines to ensure that security-constrained dispatch and associated LMPs better reflect the realities of the electricity system and reduce the need for out-of-market intervention by the IESO.

The MSP will monitor changes to individual facility data to assess the effects that the changes may have on dispatch and economic efficiency. Changes to this data may be part of a broader strategy by a market participant to inappropriately influence market outcomes, MWPs and prices to the benefit of the participant and at the cost or expense of other market participants and consumers.

3.2.5 Market Control Entities

A market control entity (MCE) is any entity (registered as a market participant with the IESO or not) that could control or influence the offers and schedules of one or more market participants in the day-ahead and/or real-time market through, for example, an ownership, controlling, subsidiary or beneficial interest relationship.[57] Under the renewed markets, market participants must disclose MCEs for resources that are generation resources, dispatchable loads, price responsive loads, electricity storage resources, energy traders or virtual traders. The IESO will use this data when assessing physical withholding, where the offer quantities of resources that share a common MCE are assessed in aggregate.

To the extent that this new data provides greater insight into the ownership and control relationships of system resources, the MSP will incorporate the data in the calculation of structural measures of competition (i.e., Herfindahl–Hirschman index, Residual Supplier Index, etc.). Furthermore, to the extent that this data offers insights into profitability and beneficiary relationships, the MSP will use this data in assessing potentially inappropriate conduct such as the abuse of market power and gaming. This data may provide insights into which entities stand to profit from potential inappropriate conduct and the possible motives behind the conduct.

3.2.6 Day-Ahead to Real-Time Price Convergence

Ideally, DAM and real-time electricity prices should converge, meaning they should, on average, be similar over time. Convergence is desirable because:

- It signals a well-functioning market where participants can accurately forecast and react to real-time conditions

[57] Guide to Submitting New Registration Parameters and Forms In Online IESO, May 2025.

- Market participants who rely on day-ahead prices to make longer-term contractual commitments and investments can better manage longer-term price uncertainty and risk
- It discourages participants from artificially manipulating prices by waiting for better real-time conditions.

There are several mechanisms in the renewed markets that help facilitate convergence, including virtual trades, whereby market participants make financial trades in the DAM with the explicit requirement to buy or sell back in the real-time market, which pressures prices to converge.

Factors that can lead to divergence include the unpredictability of real time market conditions, insufficient trading volumes (illiquid markets) between DAM and the real-time markets, persistent differences in IESO demand forecasts or variable generation output forecasts between DAM and real-time, and gaming, whereby traders or entities intentionally influence prices by taking positions that disrupt the normal relationship between the markets.

The MSP will monitor persistent price differences between DAM and real-time to understand the underlying causes for the divergence, and to ensure that such differences are not a result of illiquid markets (i.e., few buyers and sellers or low trading volumes), persistent IESO forecast errors or inappropriate conduct such as gaming.

3.2.7 Market Analysis and Simulation Toolset

The IESO has developed new market simulation and analysis capabilities called the Market Analysis and Simulation Toolset (MAST) with MRP.[58] MAST enables the IESO to see and manipulate inputs into the underlying calculation engines of the new markets to conduct a “but-for” analysis of market outcomes. This new functionality is intended to provide the IESO with the tools to assess the effectiveness of the renewed markets and to identify potential solutions to address unintended outcomes and inefficiencies.

The MSP will have access to MAST and will seek to use it to assess potential anomalous market outcomes, anomalous or inappropriate conduct and

[58] IESO, Project Charter for: Market Analysis and Simulation Toolset (MAST), filing to the OEB, EB-2022-0002, Exhibit E-2-1 Attachment 3, Filed: March 4, 2022.

potential market flaws. The MSP may also use MAST to assess the overall efficiency of the newly renewed markets as part of its annual *State of the Market* reports.

3.3 Monitoring the IESO's Market Power Mitigation Framework

Through MRP, the IESO has introduced a new MPM framework, to address the potential for suppliers to exercise market power, both in an ex-ante and ex-post context.

The MSP will regularly monitor and evaluate the effectiveness of the MPM framework by applying the MSP's three-part test for the exercise of market power. The MSP will use IESO data on reference prices, constraint areas and MCEs to hone the effectiveness of the test. The MSP will use the three-part test to identify "false positives" and "false negatives." The MSP considers a false positive to have occurred when the IESO mitigates a participant's offer price ex-ante in either the DAM or real-time, and when the participant's offer did not trigger or fail the MSP's three-part test. The MSP considers a false negative to have occurred when the IESO does not mitigate a participant's offer price ex-ante in either the DAM or real-time, when the participant's offer did trigger or fail the MSP's three-part test.

3.4 General Efficiency and Competitiveness Assessment of the IESO-Administered Markets

Article 7 of By-law #2 requires the MSP, at least once annually, to provide a general assessment of the efficiency and competitiveness of the IESO-administered markets, which the MSP does in its annual *State of the Market* report.

The IESO's implementation of MRP is intended to improve the overall efficiency of the IESO-administered markets. In an upcoming *State of the Market* report, after sufficient data has been collected to permit such an analysis, the MSP intends to provide a comparison of the relative efficiency and competitiveness of the legacy markets to the renewed markets. This analysis is not intended to be an audit of MRP at achieving its objectives. Instead, it is intended to offer insights into the overall efficiency implications

of the changes, including where certain efficiencies may or may not have been realized and where improvements in design may be desirable.

Over the next year, the MSP will consider different modelling approaches to assessing the overall efficiency implications of the introduction of MRP, recognizing the challenges of doing a standard “but-for” analysis that can appropriately capture the significant changes to the markets that will have occurred.

4 SUMMARY REMARKS

The purpose of the MSP in Ontario's electricity sector is to monitor, investigate, review, and report on activities and conduct in the IESO-administered markets, which it does typically with a view to promoting market efficiency and effective competition. The role of the MSP does not change with the introduction of the renewed markets. The MSP will continue to fulfil its mandate, albeit with additions and adjustments to its monitoring indicia and tools, to account for the various changes introduced by MRP. The MSP will continue to report on the overall efficiency and competitiveness of the IESO-administered markets in its annual *State of the Market* reports. The MSP intends to provide a comparison of the relative efficiency and competitiveness of the legacy markets to the renewed markets, after sufficient data has been collected to permit such an analysis.

Appendix - MSP recommendations to the Legacy Market Design

Since the commencement of the electricity market in 2002, the MSP has regularly and publicly reported on the state of the IESO-administered markets through its reports, including specific recommendations to the IESO for changes to the legacy market design that would foster enhancements to market efficiency. These recommendations have resulted in incremental improvements, including:

- Reforms to the auctioning of transmission rights: Past MSP recommendations in this area centered around reforms to ensure that payouts under transmission rights remained in balance with congestion rents collected. Under MRP, the basis of transmission rights payouts has now moved to the DAM.
- Refinements to the applicability and calculation of CMSC: Many past MSP recommendations addressed the way CMSC bridged the gap between unconstrained market prices and constrained scheduling. A subset of these recommendations was put in place by the IESO prior to MRP implementation. The IESO expects that the remaining recommendations will be addressed by MRP itself (see Table A-1-1) as CMSC is made unnecessary with the implementation of locational marginal pricing.
- Reforms to the Generation Cost Guarantee (GCG) programs: Recommended reforms to the GCG programs (both day-ahead and real-time) were the single-largest subject area of past MSP recommendations. For many years, the MSP recommended that competitive pressure be brought to bear on generation unit commitments to avoid the issues associated with after-the-fact cost submissions. Some prominent reforms have already been brought about in response to MSP recommendations[59] while others are expected to be addressed through MRP implementation (see table A-1-1).

[59] For example, Monitoring Report on the IESO-Administered Electricity Markets for the period from May 2008-October 2008, January 2009, Recommendation 3-3.

Table A-1-1 contains a list of past MSP recommendations to the legacy market design that the IESO deferred to the implementation of MRP. All MSP recommendations are in the public domain and may be found within past MSP reports on the OEB's website.

Recommendations relevant to the Market Renewal Program

Several of the MSP's recommendations on observed inefficiencies reported over the past 23 years are aligned with many of the goals and objectives of the MRP. Indeed, the IESO has often cited MRP as the over-arching remedy to many of the MSP's published recommendations.

At least 18 past MSP recommendations have direct relevance to the introduction of MRP. As the table below points out, MSP recommendations going back to at least 2010 called for the following market reforms:

- Locational marginal pricing: For reasons discussed in this report, locational marginal pricing offers efficiency improvements and potentially resolves a number of issues in the legacy market. Expected improvements include more efficient pricing of congestion at the interties and accounting for operating reserve shortfalls in energy prices.
- More efficient unit commitment: Perhaps the largest category of MRP-related recommendations is related to the various generation cost guarantee programs. MRP will bring about new unit commitment mechanisms in the DAM and pre-dispatch that account for registered facility characteristics and submitted costs at the time unit commitment decisions are made, and bring competitive pressure to bear on such decisions. As noted in the table below, the absence of such competitive pressures and advance disclosure of production costs have resulted in numerous issues that have been the basis of MSP recommendations over the years.
- Improvements in other functional areas, including Intertie Offer Guarantees, pricing of operating reserve shortfalls and containment of gaming incentives**:** These areas were also subjects of past MSP recommendations where MRP-related functionality will likely have a significant impact.

Past MSP recommendations in these areas are also listed in Table A-1-1.

Table A-1-1: List of Past MSP recommendations directly related to MRP functionality

Report Issuance Date	Rec. No.	Recommendation
January 29, 2010	3-5 (i)	The Panel recommends that the IESO provide market participants with specific parameters for determining operating plant characteristics, including Minimum Loading Point (MLP), Minimum Run-Time (MRT) and Minimum Generation Block Run-Time (MGBRT) in order to ensure that submitted operating characteristics, which affect market outcomes, reflect actual operating capabilities.
January 29, 2010	3-5 (ii)	The Panel recommends that the IESO develop a compliance or other review mechanism for ensuring that submitted operating characteristics are appropriate having regard to the parameters specified and equipment capabilities.
August 30, 2010	3-4	To the extent that the IESO believes a reliability program such as the generation cost guarantee program continues to be warranted, the IESO should base the guarantee payment on the offer submitted by the generator or should implement another solution that would require actual generation costs to be taken into account at the time of scheduling decisions.
March 10, 2011	3-3	As part of its “market road map” process, the IESO should work with stakeholders to examine the feasibility of replacing the two-sequence design with locational pricing, variable pricing for dispatchable resources or other alternatives.
March 10, 2011	3-4(ii)	On an interim basis until after-the-fact start-up cost submissions are capped by generator offer prices and CMSC payments to ramping down generators are eliminated, the IESO should amend the Generation Cost Guarantee program to limit generators to one start-up cost guarantee submission per day unless the IESO requests a second start during the day.
April 27, 2012	4-1	The Panel recommends that the IESO proceed with development work on those recommendations of the Electricity Market Forum that are directed at improving market efficiency, including the consideration of options to replace the two-schedule structure of the current market design.
June 21, 2013	2-1	The IESO should consider expanding the current local market power framework to cover analogous circumstances that arise as part of the day-ahead commitment process.

Report Issuance Date	Rec. No.	Recommendation
January 6, 2014	3-2	If the IESO, after performing its detailed analysis, determines that the RT-GCG program continues to be needed, the Panel recommends that the IESO modify the RT-GCG program such that the revenues that are used to offset guaranteed costs under the program are expanded to include any profit (revenues less incremental operating costs) earned (a) on output above a generation facility's minimum loading point during its minimum generation block run time (MGBRT), and (b) on output generated after the end of the facility's MGBRT.
January 6, 2014	3-3	The Panel recommends that the IESO re-examine the question of integrating exports into EDAC to reduce the need to commit additional generation in real-time to meet export demand that currently only appears in the market in real-time. While the Panel is not recommending a specific approach for integrating exports, the following have been identified as potential options: (a) introduce a mechanism that encourages exports to bid in EDAC; or (b) include a forecast of exports when commitments are made under EDAC.
October 8, 2015	2-1	The Panel recommends that the IESO assess the methodology used to set the intertie zonal price for a congested intertie when the Net Interchange Scheduling Limit is binding or violated, in order to make the incentives provided by the intertie zonal price better fit the needs of the market.
November 17, 2016	2-1	Given the number of recent changes in the Operating Reserve market, the Panel recommends that the IESO review whether the real-time Operating Reserve prices transparently reflect the value of Operating Reserve as more Control Action Operating Reserve (CAOR) capacity is scheduled, and whether changes to Control Action Operating Reserve offer quantities and prices could enhance the efficiency of the Operating Reserve market.
November 17, 2016	3-1	The Panel recommends that the IESO eliminate from the Real-time Generation Cost Guarantee program the guarantees associated with: (a) incremental operating costs for start-up and ramp to minimum loading point; and (b) incremental maintenance costs for start-up and ramp to minimum loading point.
November 17, 2016	3-2	The Panel recommends that the IESO modify the Real-time Generation Cost Guarantee program such that the revenues that are used to offset guaranteed costs under the program are expanded to include any net energy and Operating Reserve revenues earned, as well as all congestion management settlement credit payments received, on: (a) output above a generation facility's minimum loading point during its minimum generation block run time (MGBRT), and (b) output generated after the end of the facility's MGBRT.

Report Issuance Date	Rec. No.	Recommendation
May 8, 2017	3-2	The IESO should revise the methodology used to set the intertie failure charge to include the congestion rents that an intertie trader avoids when it fails a scheduled transaction for reasons within its control.
December 19, 2019	2-1	The IESO should consider ways and means of deterring the Intertie Operating Reserve nodal price chasing behaviour described in this report.
December 17, 2020	2-1	The IESO should eliminate the payment for start-up costs for second and subsequent RT-GCG runs in a day. Alternatively, when a generation unit has participated in the RT-GCG program once during a day, the IESO should consider ways to have the generation unit compensated on the basis of the lesser of the second and subsequent submitted start-up costs or the estimated cost of keeping the generation unit online between RT-GCG runs.
September 2, 2021	3-3	The IESO should immediately cease reimbursements to gas generators of carbon cost payments.
September 2, 2021	3-4	If the IESO insists on reimbursement of carbon cost payments, they should develop a methodology that preserves the incentives of the carbon price. Any reimbursement should amount to a small percentage of the carbon cost payments imposed by the carbon pricing system. Only facilities that have paid an annual carbon cost charge should qualify for the carbon cost reimbursement.