

August 11, 2022

**VIA Email and RESS**

Independent Electricity System Operator

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Ms. Nancy Marconi  
Registrar  
Ontario Energy Board  
27<sup>th</sup> Floor 2300 Yonge Street  
Toronto, ON M4P 1E4

Dear Ms. Marconi,

**Re: Generic Hearing on Uniform Transmission Rates-Related Issues and the  
Export Transmission Service Rate  
Ontario Energy Board File No.: EB-2021-0243**

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The Independent Electricity System Operator ("IESO") is writing to file its responses to the undertakings provided by the IESO panel from the Presentation Day on August 4<sup>th</sup>, 2022.

Please contact George Dimitropoulos, Senior Advisor, Regulator Affairs at [George.dimitropoulos@ieso.ca](mailto:George.dimitropoulos@ieso.ca) if you have any questions.

Yours truly,



Devon Huber  
Director, Regulatory Affairs & Market Rules

cc: Mr. Patrick Duffy Stikeman Elliott LLP (email)  
All EB-2021-0243 Intervenors (email)

## UNDERTAKING JP-1.03

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**Reference:** No reference provided.

**Undertaking:** To advise on the status of IESO's plan for implementation of the Market Renewal Program, in particular locational marginal pricing.

**Response:**

The IESO has been working with vendors and stakeholders to refine and translate the Market Renewal Program design into the system requirements and rules needed to finalize the delivery schedule. This includes delivering substantial enhancements to more than ten legacy IT systems that work together to ensure day-to-day reliability, integrity and cost-effectiveness of Ontario's electricity system and markets. As these detailed requirements and the associated development times for solutions were validated by vendors, the IESO identified that the current projected schedule is no longer feasible. The IESO will share changes to the project schedule with stakeholders towards the end of Q3 2022.

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## UNDERTAKING JP-1.04

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**Reference:** No reference provided.

**Undertaking:** To provide an estimate of the cost of a three-day shutdown of a nuclear unit.

**Response:**

The cost of a nuclear unit shutdown has been estimated to be \$2-\$3 million in 2012 based on past analysis conducted by the IESO to support a rule amendment related to exports. Please see the attached IESO Technical Panel analysis from July 2012 filed as Attachment 1 to this undertaking.

This estimate is based on determining the replacement cost for energy from a nuclear unit that otherwise would have provided but for its shutdown. It was assumed that the replacement energy would be from natural gas resources. The IESO has not updated this analysis for current conditions. Since natural gas prices have at least doubled from 2012, a three-day nuclear shutdown today is estimated to cost at least \$4-\$6 million.

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# MR-00393 Limiting Payments to Exports during Negative Prices.



MR-00393 proposes to limit the payments made to exports during negative prices. The IESO would achieve this by placing a settlement floor price for exports on the intervals in which the zonal price at the intertie was negative and the intertie was not import congested.

## *Analysis*

The IESO performed analysis to understand the impact of this Market Rule on the following:

1. the quantity of scheduled exports,
2. the number of nuclear shutdowns,
3. total Ontario welfare, and
4. the impact of non-prescribed/non-contract generation

The impacts were estimated retrospectively using data from the 30 month period from January 2010 to June 30<sup>th</sup> 2012. Over that time period this rule would apply to 506 hours (import congested hours have been removed): 82 in 2010, 274 in 2011 and 150 in Jan-June 30<sup>th</sup> 2012.

### *1. Impact on Scheduled Exports*

MR-00393 will increase the price paid to exports from Ontario in some negative price hours. Higher export prices will reduce the profit opportunities for exporters, and could therefore reduce the quantity of exports scheduled from Ontario.

Export profit opportunities were assessed on an ex-post basis over various trade routes by comparing real-time prices in Ontario and neighbouring jurisdictions and then assessing the impact of limiting the real time Ontario zonal price at the intertie to -\$8. Profit opportunities were calculated as the difference between the relevant external Locational Marginal Price (LMP) and the real-time Ontario Intertie Zonal Price (IZP) less the fees paid by exports (uplift charges, IESO fee, and export tariff fee). An export risk premium of \$3/MWh was added to the cost of the export.<sup>1</sup> The IESO analysis identified the hours in which MR-00393, by increasing the price paid by the exporter, would have resulted in a negative export profit. The analysis showed that, in 39 hours (0 in 2010, 23 in 2011 and 16 in 2012) an export would have become unprofitable on at least one trade route.

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<sup>1</sup> The recent CRA study of the impact of different Export Transmission Service Charges computed an average risk premium for an export from Ontario at \$3/MWh. We incorporate this risk premium into our analysis.

The IESO used these results to determine the number of hours in which there would likely have been a reduction in the quantity of exports scheduled. The IESO considered four possible outcomes for the reduction in exports. More specifically, when an export trade route was deemed to have become unprofitable as a result of the rule change, the IESO assumed that the quantity of exports would have reduced by (i) 25%, (ii) 50%, (iii) 75% and (iv) 100% of the actual amount of exports scheduled on the trade path in the hour.

*2. Potential Increase in Nuclear Shutdowns*

A reduction in the quantity of scheduled exports in the 39 hours identified above would have increased the chance that a nuclear unit would have needed to reduce its output and potentially shutdown. After considering the amount of flexible nuclear available within the impacted hours, the IESO analysis indicates that had the market rule been in effect, there would have been no additional nuclear shutdowns in 2010, 2 additional shutdowns in 2011, and 1 to 2 additional shutdowns in the first half of 2012 (See Table 1).

*Table 1: Number of Additional Nuclear Shutdowns by Export Reduction Scenario*

	<b>Reduced Export scenarios (for 39 impacted hours)</b>			
	<b>25%</b>	<b>50%</b>	<b>75%</b>	<b>100%</b>
<b>2010</b>	0	0	0	0
<b>2011</b>	2	2	2	2
<b>2012 (Jan-June 30)</b>	0	1	1	2

*3. Total Ontario Welfare*

The change in total Ontario welfare, which is a measure of the net economic benefit to Ontario from the market rule change, is typically calculated as the sum of changes in Ontario consumer surplus and Ontario producer surplus. For the purpose of this review, the IESO has not conducted a detailed analysis of all the variables affecting the consumer and producer surplus measures. However, the change in the net benefit to Ontario can be estimated generally by comparing the increase in the payments made by exporters to Ontario less any additional cost or lost revenue to the province caused by fewer exports. The result of this analysis is presented in Table 2 below. While a detailed study of the impacts on Ontario consumer and producer surplus would provide more insight into how the rule change would affect specific Ontario participants, it would not change the direction of the conclusion regarding the net economic benefit to the province as a whole.

The market rule change essentially places a floor on what exporters are paid to consume during hours of surplus baseload generation and negative prices; the price floor allows exports to consume the power for free but prevents a net payment for consumption. With the price floor, exports that continue to be scheduled will pay a higher price to (or in this case be paid less by)

Ontario. This leads to higher revenues being recovered by the province. The estimated higher revenues that the province would have earned in 2010 through 2012 had the market rule been in place are presented in the first row of Table 2.

The price floor could lead to a reduction in exports. Exports pay additional fees to the province to consume power. These include the hourly uplift and export transmission service tariff as an example. With a reduction in exports scheduled, the province will no longer recover this revenue. This represents a loss to the province. This loss for 2010 through 2012 is presented in the second row in Table 2.

Furthermore, the reduction in exports increases the chance of nuclear shutdowns. The cost to the province of a nuclear shutdown is seen through the need to rely on more expensive generation in times when the nuclear unit is shutdown but we are no longer in a surplus situation. The replacement energy for a nuclear shutdown lasting 72 hours has been calculated to be between \$2-3 million. This represents a cost to the province. This cost for 2010 through 2012 is presented in the third row of Table 2.

The change in net economic benefit to the province from MR-00393 is presented in the final column of Table 2. In all years, the market rule change would have resulted in a positive net economic benefit for Ontario.

*Table 2: Net Economic Benefit to Ontario*

	2010	2011	2012 (Jan – Jun)
Additional Revenue Recovered From Exports	\$2.0 mil.	\$15.45 mil.	\$7.9 mil.
<b>Less:</b> Reduced Export Fees Received	\$0	-\$0.04 mil.	-\$0.02 mil.
<b>Less:</b> Higher System Costs from Nuclear Shutdowns	\$0	-\$ 4-6 mil.	-\$ 2-6 mil.
<b>Net Economic Benefit to Ontario</b>	<b>\$2.0 mil.</b>	<b>\$9.41-11.41 mil.</b>	<b>\$1.88-5.88 mil.</b>

#### 4. Consideration of Non-Prescribed and Non-Contracted Exports

The IESO has considered the comments at the Interjurisdictional Trading Committee and the Technical Panel, with respect to non-prescribed or non-contracted generation that is operating at times in which this rule would apply. It is accurate that non-prescribed and non-contracted generation does pay into the market up to half of the amount which exports are paid at the same time, however we disagree with the notion that this generation is supporting the exports.

When considering the impact of exports withdrawing during these prices, it is evident that the generation that will be required to move will be the contracted nuclear. In addition, in looking more closely at the hours in which this rule would apply, in over 90% of the hours in which this



rule would apply in 2010 to 2012 (June 30<sup>th</sup> 2012), nuclear was the marginal resource. This is consistent with the analysis we performed to understand the impacts of this rule on the increased number of nuclear shutdowns. It is appropriate therefore to consider that the nuclear units, which are all fully protected from the negative price and are reimbursed by the consumer are supporting those exports and represent the avoidable cost, not the non-prescribed assets, which would continue to operate and pay to do so, with or without this rule being in effect.

The following table outlines for negative priced intervals the number of MWs and payments made to the exports versus the number of MWs and payments made by the assets that historically move in response to reduced exports and all generation operating at that time.

*Table 3: Export and Domestic Generation Quantity and Payment Comparison*

	2010 MW	2010 Payments	2011 MW	2011 Payments	2012 MW	2012 Payments
Exports	34,372	\$2.3 mil.	172,169	\$16.8 mil.	93,234	\$8.6 mil.
Bruce Nuclear <sup>2</sup>	90,433	\$5.5 mil.	404,879	\$39.6 mil.	239,912	\$23.0 mil.
All Generation	272,589	\$16.6 mil.	1,375,745	\$136.3 mil.	826,195	\$79.2 mil.

The IESO does not dismiss that there are non-prescribed and non-contracted resources operating at times when exports are being paid, however historical operation has shown that these resources continue to generate with or without reduced MWs of exports and therefore do not agree that they are contributing to the export MWs at these times. Additionally, in 2011 these resources represented less than 10% of the total \$ paid by generators during these intervals.

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<sup>2</sup> Based on historical practice typically Bruce units are the units which would be manoeuvred or shutdown in times of SBG



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