



DECEMBER 14, 2020

Transmission Rights Market Review

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Purpose

- Update stakeholders on work performed on the Transmission Rights (TR) Market Review since the webinar on October 27
- Present a list of high-value opportunities identified through Stage 2 – Near Term Changes
- Kick off Stage 3 – Long Term Changes by presenting an overview of Market Renewal Program (MRP) linkages to the TR Market



TR Market Review Update

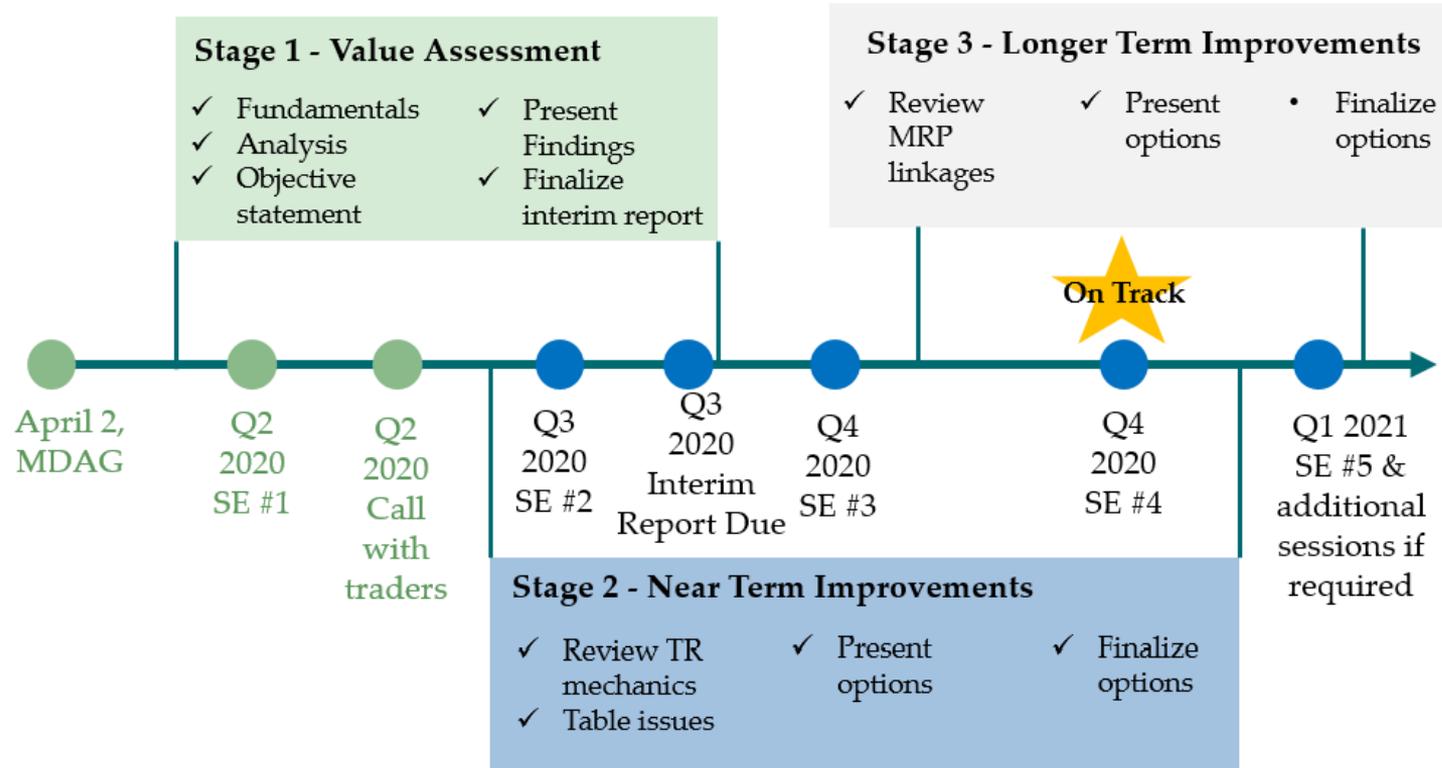
TR Market Review Update – Stage 2

- Since the October 27 webinar, the IESO has considered various options that have been identified through Stage 2 discussions
- Based on stakeholder feedback and internal assessments, the IESO has identified a set of high-value opportunities for Stage 2 of the TR Market Review

TR Market Review Update – Stage 3

- Since the October 27 webinar, the IESO has identified the relevant MRP changes and their impact on the TR market
- The IESO will present the linkages between the relevant MRP changes and the TR market and start the discussion with stakeholders to identify potential changes required to ensure the TR market and the MRP changes are in alignment with each other

TR Market Review - Timeline



TR Market Review and Implementation

- At the conclusion of the TR Market Review engagement, the IESO will identify a set of high-value opportunities for Stage 2 and propose a set of long-term changes for Stage 3 to enhance the value and function of the TR market and to ensure alignment with the future renewed market
- Implementation of any identified opportunities or proposed changes is outside the scope of this engagement as all potential projects and their associated benefits cases must be evaluated and prioritized by the IESO against other competing projects before being considered for implementation. Separate engagements may be required during the implementation process



Stage 2 High Value Opportunities

Introduction - Key Considerations for Stage 2

- The overall objectives of the TR Market
- Principles that fall within the IESO's broader mandate (efficiency, competition, implementability, certainty, transparency)
- Stakeholder feedback
- Compatibility and alignment with MRP changes
- Best practices in North American FTR markets
- Legal considerations

Stage 2 High-Value Opportunities

Stage 2 High Value Opportunities	Tool Changes/ Upgrades Required	Key Considerations
Multiple Bid Laminations	Yes	<ul style="list-style-type: none">• Broad stakeholder support• Best practice in North American FTR markets
New On-peak / off –peak products	Yes	<ul style="list-style-type: none">• New products enable more opportunities for traders
Reconfiguration auctions	Yes	<ul style="list-style-type: none">• Reconfiguration auctions were requested by most stakeholders, and could increase TR liquidity
Publishing additional information	No	<ul style="list-style-type: none">• Additional information could help market participants with more timely and transparent information

Stage 2 Options Ruled Out

Other Stage 2 Options Ruled Out	Tool Changes/ Upgrades Required	Key Considerations
Seasonal and weekly TRs	n/a	<ul style="list-style-type: none">Limited stakeholder support
Secondary market	n/a	<ul style="list-style-type: none">An alternative process already exists
Some additional information requested by stakeholders	n/a	<ul style="list-style-type: none">Legal considerations
TR auction timeline changes	n/a	<ul style="list-style-type: none">Existing timelines cannot be easily changed
Credit requirements	n/a	<ul style="list-style-type: none">Limited need for changes at this time

Multiple Bid Laminations

Allowing up to 20 bid laminations for each TR product is a high value opportunity identified by IESO and stakeholders

- This will allow for increased efficiency, competition, and certainty in the TR auctions
- All stakeholders during Stage 2 discussions believed that multiple bid laminations should be enabled as a top priority
- Multiple bid laminations are a general best practice in all US FTR markets

Types of TRs to be Sold

Introducing on-peak/off-peak TR products in both the long-term (LT) and short-term (ST) time-frames is a high value opportunity identified by IESO and stakeholders

- These new on-peak and off-peak products would be offered in parallel with the current 24/7 ST and LT TR products
- Offering these new differentiated products could enable more varied opportunities for traders, increasing utilization of the interties
- The IESO would consider either 1) dynamic optimization or 2) a fixed % to determine the breakdown among various TR products

Types of TRs to be Sold (continued)

The IESO will continue to sell all LT TRs for 12-month periods only

- Some stakeholders wanted LT TRs that were valid for 24-month periods, or the option to purchase only certain months out of the 12-month period
- Stakeholders have expressed concerns about high LT TR cost and credit requirements, which present barriers to smaller traders and would likely be exacerbated with the sale of a 24-month product
- The option to purchase certain months of the 12-month period would lead to added administrative complexity in the TR market

Types of TRs to be Sold (continued)

Based on stakeholder feedback, the IESO sees limited value in providing weekly or seasonal TRs

- Most stakeholders did not think weekly TRs were necessary, and they are not common in other jurisdictions
- The sale of seasonal TRs would add a greater level of complexity to the functioning of the TR market for the IESO, and this was not a priority for most stakeholders

Number of TRs to be Sold

The IESO will continue to sell 25% of all TRs as LT TRs, and the remaining 75% as ST TRs

- The continued division of LT and ST TR products strikes a good balance between the optimal use of outage information, and feedback from stakeholders on their desire for hedges in different timeframes

Number of TRs to be Sold (Continued)

The IESO has identified paths where congestion is very infrequent and the manner in which TRs are sold on these paths is an issue that will need to be addressed

- IESO continues to look into this issue and will engage with stakeholders, in the future on options and any proposed changes

Reconfiguration Auctions / Secondary Market

The IESO has identified reconfiguration auctions as a high value opportunity, but does not see as much value in a secondary market

- Reconfiguration auctions could be used to allow TR holders to reconfigure their TRs into smaller segments and sell them in subsequent monthly auctions
- Reconfiguration auctions were requested by most stakeholders, and could increase TR liquidity
- There is an existing process that can be used by stakeholders to transfer their rights

TR Auction Timeline

The IESO intends to maintain the existing auction timelines

- The existing auction timelines are optimized and cannot be easily changed due to onerous downstream implications
- Depending on any changes from high value opportunities, the IESO may require a large degree of new automated processes to keep the existing TR Auction timeline
- Until these changes are better understood, the IESO will not pursue other timing proposals

Credit Requirements

The IESO does not intend to pursue any changes related to credit requirements

- Given the list of high value opportunities, the IESO does not see the need to change credit requirements at this time
- This could be revisited at a later date depending on future changes

Information Provided

The IESO sees providing more information on internal constraints and rationale for determining the number of TRs in the Pre-Auction reports as a high value opportunity

- The IESO aims to strike a balance between providing sufficient information to market participants and keeping the pre-auction report concise and manageable
- The IESO may consider adding outage IDs to the TR Pre-Auction reports, so that Market Participants can cross reference with the public Outage Reports*

*Outage reports are available to market participants via [IESO Public Reports](#)

Information Provided (Continued)

Illustrative Language for the Pre-Auction Report:

- “The expected ATC has been reduced to 600 MW and 500 MW respectively by respecting one element out of service to account for occurrences of short notice forced outages”
- “Reductions in the expected ATC as a result of operational constraints help ensure congestion rent collected on a specific path is sufficient to cover TR payment obligations during the applicable period”

Information Provided (Continued)

After legal consultation, the IESO will not publish TR bids, TR ownership information, or the split between financial and physical traders in each TR auctions

- In Market Manual 2.14 - Information Confidentiality Catalogue, TR bids and the number of TRs awarded are explicitly identified as confidential
- Given the limited number of physical traders on specific paths, disclosing the split between financial and physical traders in each TR auctions will potentially reveal TR ownership information which is prohibited by the Information Confidentiality Catalogue



Stage 3 – Long Term Changes

Stage 3 – Long Term Changes

- The objective of Stage 3 is to propose long-term changes to the TR market to ensure alignment and compatibility with the MRP
- The IESO has (1) identified the relevant MRP changes, (2) highlighted their potential impact on the TR market, (3) summarized the default changes required to bring the TR market in alignment with the MRP

Relevant MRP Changes - Price

Pre-MRP / Currently:

- The Intertie Zonal Price (IZP) is the intertie settlement price
- The Intertie Congestion Price (ICP) is the difference between the IZP and the uniform Ontario Market Clearing Price (MCP)
- The ICP is calculated in pre-dispatch (PD) and carried over to real-time (RT)
- Congestion resulting from a Net Interchange Scheduling Limit (NISL)* constraint is omitted from the IZP

* See Appendix for more details on NISL

Relevant MRP Changes – Price (continued)

Post-MRP:

- The Locational Marginal Price (LMP)* at the intertie proxy location will replace the IZP to be the intertie settlement price
- The NISL component will be added to the intertie LMP
- The LMP at the intertie proxy**
$$= Ref_{LMP} + Loss_{LMP} + Int_Cong_{LMP} + Tie_Cong_{LMP} + NISL_Cong_{LMP}$$
- The ICP = $Tie_Cong_{LMP} + NISL_Cong_{LMP}$

* See Appendix for more details on intertie LMP

** Int_Cong_{LMP} refers to "Internal Congestion", Tie_Cong_{LMP} refers to "Intertie Congestion"

Relevant MRP Changes – Price (continued)

Impact on the TR Market:

- By default, TRs will continue to hedge the import/export congestion portion of the ICP (*Tie_Cong_{LMP}*) but only in the Day-Ahead Market (DAM) time frame
- The IESO is currently conducting a jurisdictional scan on US FTR markets regarding NISL congestion hedge and would like to hear from stakeholders on this topic in the context of Ontario (E.g. What are the benefits and risks of hedging DAM NISL congestion costs with TRs?)

Relevant MRP Changes – Price (continued)

Default Changes Required:

- TR Settlement processes and tools need to be updated with DAM price
- All relevant market rules, market manuals and other internal and external documents, procedures and tools need to be updated accordingly

Relevant MRP Changes - TR Settlement Timeframe

Pre-MRP/Currently:

- TRs are settled at RT ICP* to provide a hedge for intertie congestion costs that occur in RT

* Currently, RT ICP is calculated in PD and carried over to RT.

Relevant MRP Changes - TR Settlement Timeframe (2)

Post-MRP:

MRP DAM High-Level Design Decision:

- “The IESO has determined that intertie FTRs will be settled at DAM prices to provide market participants with the ability to hedge DAM congestion. Settling FTRs at DAM prices will also drive greater import and export participation in the DAM since it is a market participant’s only opportunity to hedge congestion.”

Relevant MRP Changes - TR Settlement Timeframe (3)

Post-MRP (Continued):

- By default, TRs will be settled on DAM *Tie_Cong_{LMP}* to provide a hedge for import/export congestion costs based on DAM schedules
- TRs will not be offered to hedge RT congestion because the DAM is the opportunity for participants to hedge against RT price volatility

Relevant MRP Changes - TR Settlement Timeframe (4)

Impact on the TR Market:

- The RT schedule may differ from the DAM schedule, resulting in congestion costs/savings* for import/export congestion and NISL congestion in RT
- According to the MRP DAM High-Level Design decision, TRs will not be offered to hedge intertie congestion costs that occur in RT

* The Incremental or decremental congestion costs/savings in RT will be calculated based on the difference between the DAM schedule and the RT schedule and the RT ICP ($Tie_Cong_{LMP} + NISL_Cong_{LMP}$)

Relevant MRP Changes - TR Settlement Timeframe (5)

Default Changes Required:

- RT congestion rents/savings for import/export congestion and NISL congestion (incremental/decremental to the DAM schedule) will be collected in a separate account and disbursed/charged to market participants by using the same methodology as the current TRCA disbursement

Relevant MRP Changes - TR Settlement Timeframe (6)

Default Changes Required:

- TR settlement processes and tools need to be updated with DAM price and intertie limits (E.g. The current TR payment clawback process* refers to RT unconstrained limits and will need to be updated to DAM limits)
- All relevant market rules, market manuals and other internal and external documents, procedures and tools need to be updated accordingly

* Market Rules Chapter 8, Section 4.4.2 requires that no TR payouts are made when the intertie limit is reduced to 0 MW only in one direction. Click [here](#) for more details.



Stakeholder Feedback Requested and Next Steps

Stakeholder Feedback Requested

- Please provide further comments on the high-value opportunities identified during Stage 2
- What are the benefits and risks of hedging DAM NISL congestion costs with TRs? Please provide detailed examples, evidence and rationale.
- Please provide comments on the default changes or any other changes required to the TR market as a result of the relevant MRP changes

Submitting Stakeholder Feedback

- Written feedback can be provided to engagement@ieso.ca using the feedback form on the engagement web page by January 18, 2021.
- Please use the feedback form provided to ensure stakeholder feedback is compliant with the Accessibility for Ontarians with Disabilities Act (AODA). If you choose not use the IESO feedback form, please provide an AODA compliant pdf document.

Next Steps

- Based on stakeholder feedback and internal assessments, the IESO plans to finalize the Stage 2 high-value opportunities and present a draft set of proposed changes for Stage 3 in a subsequent stakeholder engagement session



Appendix

Appendix - NISL

- The NISL is an administrative constraint imposed to the cross-hour change of the net interchange schedule across all interties
- The IESO limits the net interchange from hour-to-hour to 700 MW
- NISL could be expanded due to reliability concerns
- The purpose of this limit is to restrict large changes on the net interchange schedule that can have an adverse impact on the reliability of the IESO-controlled grid

Appendix - NISL

- Today, NISL is implemented in both the day-ahead process and real time pre-dispatch process. The NISL congestion price is generated and published by the DSO for both the constrained and unconstrained runs. However, the NISL congestion cost is currently omitted from applying to intertie settlement prices.
- Under the MRP, the NISL congestion component will be included in the intertie LMP. When NISL congestion occurs, the NISL congestion component of the intertie LMP will be the same across all interties.
- NISL congestion component can be positive or negative, resulting in NISL congestion costs or savings.

Appendix - NISL

- From 2017 to 2020, NISL congestion occurred approximately 7% of the time. When NISL congestion occurred, the average NISL congestion price was about \$2.25*.
- Today, pre-dispatch is myopic as a result of the sequential, single-hour optimization. NISL is determined based on changes from the previous hour to the current hour.
- As a result of the MRP multi-hour optimization, NISL can be set based on a large change from previous hour to the current hour or from the current hour to the future hour. Therefore, the frequency and magnitude of NISL in DAM is expected to reduce.

* Based on unconstrained NISL shadow prices from January 1, 2017 to October 31, 2020.

Appendix – Intertie LMP

- Market Scheduling Points (MSP) are equivalent to intertie zones
- Boundary Entity Resources (BER) are resources located at proxy locations within external control areas
- The LMP will be the same for all buses with the same combination of proxy location and intertie zone

Intertie	MSP Name	Boundary Entity resource Name	# of BER Resources	Description
Michigan	MISI	MI.LUDINGTON.SINK	50	Export to US (except PJM) via <i>IESO/Michigan intertie</i>
		MI.LUDINGTON.SOURCE	50	Import via <i>IESO/Michigan intertie</i> from the US (except PJM)
		WC.PRAIRERANGES.SINK	5	Export to Canada via <i>IESO/Michigan intertie</i>
		MD.CALVERTCLIFF.SINK	40	Export to PJM via <i>IESO/Michigan intertie</i>
		MD.CALVERTCLIFF.SOURCE	40	Import via <i>IESO/Michigan intertie</i> from PJM
New York	NYSI	NY.ROSETON.SINK	50	Export to US (except PJM) via <i>IESO/NYISO intertie</i>
		NY.ROSETON.SOURCE	50	Import via <i>IESO/NYISO intertie</i> from the US (except PJM)
		EC.MARITIMES.SINK	2	Export to Canada via <i>IESO/NYISO intertie</i>
		MD.CALVERTCLIFF.SINK	40	Export to PJM via <i>IESO/NYISO intertie</i>
		MD.CALVERTCLIFF.SOURCE	40	Import via <i>IESO/NYISO intertie</i> from PJM

Source: Table E-1 in Market Manual 4.2

Appendix – Intertie LMP

- Intertie transactions associated with the same proxy location, but specified as occurring at different intertie zones, subject to phase shifter operation, will be modelled as flowing across independent paths. Pricing of these transactions will utilize shadow prices associated with the internal transmission constraints, interchange scheduling limits and transmission losses applicable to the path associated to the relevant intertie zone
- To model an intertie as out-of-service, the intertie transmission limits will be set to zero and all import offers and export bids will receive a zero schedule. In this case, the import/export and NISL congestion components of the LMP will be zero

Thank You

ieso.ca

1.888.448.7777

customer.relations@ieso.ca

engagement@ieso.ca



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