

Market Rule Amendment Proposal Form

Part 1 - Market Rule Information

Identification No.:	MR-00479-R00
Subject:	Transmission Rights Market Enhancement and Platform Refresh
Title:	Transmission Rights Market Enhancement and Platform Refresh
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration <input checked="" type="checkbox"/> Deletion <input checked="" type="checkbox"/> Addition
Chapter:	3, 5, 8, 9, 11
Appendix:	2.2, 8.1
Sections:	Chapter 3: 6 Chapter 5: 12 Chapter 8: 1, 4 Chapter 9: 6 Chapter 11: Definitions
Sub-sections proposed for amending:	Chapter 3: 6.3A Chapter 5: 12.1 Chapter 8: 1.1, 4.1, 4.5, 4.9, 4.11, 4.13, 4.14, 4.15, 4.16, 4.17, 4.19 Chapter 9: 6.3, 6.4, 6.5 Chapter 11: Definitions
Current Market Rules Baseline:	50.1

Part 2 - Proposal History

Version	Reason for Issuing	Version Date
1.0	Draft issued for stakeholder review	November 1, 2023
2.0	Draft issued for Technical Panel review	January 9, 2024

Version	Reason for Issuing	Version Date
3.0	Draft issued for Technical Panel review	February 6, 2024
4.0	Recommended to IESO Board by Technical Panel	February 13, 2024
5.0	Approved by IESO Board of Directors	June 2, 2024

Approved Amendment Publication Date: June 2, 2024

Approved Amendment Effective Date: **June 25, 2024**

Part 3 - Explanation for Proposed Amendment

Provide a brief description that includes some or all of the following points:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

The IESO is proposing to amend the market rules to make a series of enhancements related to the Transmission Rights Market and to clean up aspects of the market rules which are outdated.

Background

The Ontario Transmission Rights Market was established at market opening and has been operating largely based on its original design since 2002. The IESO conducted a Transmission Rights Market Review (completed June 2021) and identified opportunities to enhance functionality and flexibility for market participants. One of the enhancements that will be implemented in this project is the introduction of multiple bid laminations. The IESO is seeking to align the implementation of these features with the Transmission Rights Auction platform upgrade being conducted to align with other IESO software systems. Additional information can be found on the Transmission Rights Market Enhancement and Platform Refresh project [engagement webpage](#).

While assessing the market rule amendments required to implement the Transmission Rights Market Enhancement and Platform Refresh project, the IESO identified numerous other rules that were out of date. These proposed market rule amendments reflect the removal of provisions that are no longer required, such as provisions related to the opening of the Transmission Rights Market.

Discussion

Chapter 3

- Updated one provision to reflect the Transmission Rights Auction design, specifically, to remove the concept of transmission rights owners selling their transmission rights in a

Transmission Rights Auction, which is not a feature of the current or updated Transmission Rights Auction

Chapter 5

- Updated one provision to reflect Transmission Rights Auction design, specifically, to remove the concept of transmission rights owners selling their transmission rights in a Transmission Rights Auction, which is not a feature of the current or updated Transmission Rights Auction

Chapter 8

- Updated several provisions to reflect the Transmission Rights Auction design
- Removed references to software inadequacies, as they related to the commencement of the Transmission Rights Market
- Removed references to the sale of transmission rights by transmission rights holders, which is not a feature of the current or updated Transmission Rights Auction
- Removed references to transmission rights of varying periods of validity, and software issues related to such varying periods, as this is also not a feature of the current or updated Transmission Rights Auction
- Updated procedures for awarding transmission rights where there is a tie, to reflect the Transmission Rights Auction design. These procedures were moved into the Chapter 8 Appendices
- Updated transmission rights bid and bidding limit requirements for introducing multiple bid laminations to reflect the Transmission Rights Auction design
- Updated the information in relation to how the Market Clearing Price is established to reflect the Transmission Rights Auction design

Chapter 9

- Updated several provisions to reflect the Transmission Rights Auction design
- Introduced a new provision related to post-auction report to reflect the Transmission Rights Auction design

Chapter 11

- Updated several definitions to reflect the Transmission Rights Auction design
- Clarified the definition of "TR bid" to reflect introduction of "TR lamination" and the Transmission Rights Auction design
- Introduced new definition for "TR lamination" to accommodate introducing multiple bid laminations
- Removed definitions "TR offer" and "TR offerer" as they relate to the ability of the transmission rights holder to sell their transmission rights in a Transmission Rights Auction, which is not a feature of the current or updated Transmission Rights Auction

Chapter 2 Appendices

- Updated one provision to reflect the Transmission Rights Auction design

Chapter 8 Appendices

- Appendix 8.1 was mostly rewritten to update mathematical formulas to incorporate multiple bid laminations and incorporate processes related to tie-breaking

Part 4 - Proposed Amendment

Chapter 3

6.3A Suspension of a *Market Participant*

6.3A.4 The *IESO* may do one or more of the following to give effect to a *suspension order*:

- 6.3A.4.1 reject any *bid, offer, or TR bid or TR offer* submitted by the *suspended* market participant;
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Chapter 5

12.1 Communication Methods

12.1.5 Where a *market participant* wishes to submit dispatch data, *physical bilateral contract* data, or TR bids ~~*or TR offers*~~ in the *TR market* using private network dedicated communication links, all costs associated with such use, including but not limited to the cost of the provision and maintenance of the required communication channel, shall be borne by the *market participant*.

Chapter 8

1.1 Purpose and Application

1.1.2 The rules in this Chapter apply to:

1.1.2.1 the *IESO*; and

1.1.2.2 any *market participant* submitting *physical bilateral contract* data to the *IESO*, or holding ~~or~~, buying ~~or selling~~ *transmission rights* or *TRs*.

4.1 Purpose, Interpretation, and Transition

4.1.1 This section 4 sets forth:

4.1.1.1 the manner in which the *IESO* shall operate the *TR market* established for the purchase ~~and sale~~ of *transmission rights* associated solely with transactions between the *IESO control area* and an adjoining *TR zone*;

4.1.1.4 the manner in which the *IESO* will conduct *TR auctions* for the purchase ~~and sale~~ of *transmission rights* associated with injections and withdrawals between specified *TR zones*; and

4.1.2 A reference in this section 4 and in Appendices 8.1 and 8.2 to a *transmission right* shall, in the case of *long-term transmission rights* ~~offered, sold or~~ assigned by a *TR holder*, be deemed to include a reference to the right to the *settlement amounts* relating to one or more periods of one month under that *long-term transmission right*.

4.1.3 ~~If the *IESO* cannot, by reason of software inadequacies, administer the verification process for the assignment of the right to *settlement amounts* under a *transmission right* referred to in section 4.9.2, the *IESO* shall *publish* a notice to that effect no later than thirty days prior to the date of the first *TR auction* that it will conduct pursuant to this section 4. Until such time as the *IESO* publishes a notice to the effect that the software inadequacies have been rectified, sections 4.9.2 to 4.9.5 shall not apply and the *IESO* shall settle all amounts relating to the *transmission right* with the *TR participant* that purchased the *transmission right* in a *TR auction*. [Intentionally left blank – section deleted]~~

4.1.4 ~~If the *IESO* cannot, by reason of software inadequacies, administer the sale in a *TR auction* of *transmission rights* by *TR holders*, the *IESO* shall *publish* a notice to that effect no less than thirty days prior to the date of the first *TR auction* conducted by the *IESO* pursuant to this section 4. In such a case, no *TR holder* shall, notwithstanding any other provision of this section 4, be permitted by the *IESO* to sell a *transmission right* in a *TR auction* until the time referred to in section 4.1.5. [Intentionally left blank – section deleted]~~

4.1.5 ~~Where the software inadequacies referred to in section 4.1.4 have been rectified, the IESO shall publish a notice to that effect no less than thirty days prior to the date on which the first TR auction at which a TR holder will be permitted to sell a transmission right will be conducted by the IESO. [Intentionally left blank – section deleted]~~

4.5 ~~Allocation~~ Awarding of Transmission Rights

4.5.1 ~~The total of all *transmission rights* awarded in a given round of a *TR auction* shall not exceed the fixed amount of *transmission rights* available for such round of a *TR auction* that is determined in accordance with section 4.6, 4.7, and 4.11.10, if applicable. The IESO shall determine the number of *transmission rights* awarded to each *TR bidder* and sold by each *TR offeror* in a given round of a *TR auction* using the objective function and other processes described in Appendix 8.1. Such number shall be between zero and the number of *transmission rights* that the *TR bidder* bid to purchase or the *TR offeror* offered to sell in that round.~~

4.5.2 The objective function described in Appendix 8.1 shall have as its mathematical objective the maximization of the benefit, measured in dollars, of the aggregate willingness of ~~successful~~ *TR bidders* to pay for *transmission rights* that they have been awarded in a given round of a *TR auction*. Such maximization of benefit will be net of any unawarded *transmission rights* as described in Appendix 8.1, if applicable, net of the amounts that successful *TR offerors* were willing to accept for those *transmission rights*

4.5.3 ~~[Intentionally left blank – section deleted]~~Where:

~~4.5.3.1 two or more *TR bidders* submitted *TR bids* with the same maximum price for *transmission rights* relating to the same injection *TR zone* and withdrawal *TR zone*; and~~

~~4.5.3.2 not all of the *transmission rights* bid to be purchased in those *TR bids* can be awarded;~~

~~the number of *transmission rights* awarded to each such *TR bidder* shall be determined by allocating a share of the maximum available number of *transmission rights* to each such *TR bidder* in proportion to the number of *transmission rights* that each such *TR bidder* bid to purchase in such *TR bid*.~~

4.5.4 ~~[Intentionally left blank – section deleted]~~Where:

~~4.5.4.1 two or more *TR offerors* submitted *TR offers* with the same minimum price for *transmission rights* relating to the same injection *TR zone* and withdrawal *TR zone*; and~~

~~4.5.4.2 — not all of the *transmission rights* offered to be sold in those *TR offers* can be sold,~~

~~the number of *transmission rights* sold by each such *TR offeror* shall be determined by allocating a share of the maximum number of *transmission rights* that can be sold to each such *TR offeror* in proportion to the number of *transmission rights* that each such *TR offeror* offered to sell in such *TR offer*.~~

4.5.5 [Intentionally left blank – section deleted]Where:

~~4.5.5.1 — two or more *TR bidders* submitted *TR bids* relating to different injection *TR zones* and withdrawal *TR zones* such that the *TR bids* may be optimally awarded in more than one way;~~

~~4.5.5.2 — the injection *TR zones* and withdrawal *TR zones* referred to in section 4.5.5.1, are linked by a common limiting constraint or constraints; and~~

~~4.5.5.3 — not all of the *transmission rights* bid to be purchased in those *TR bids* can be awarded,~~

~~the number of *transmission rights* awarded to each such *TR bidder* shall be determined by allocating a share of the maximum value of *transmission rights* to each such *TR bidder* in proportion to the value of *transmission rights* that each such *TR bidder* bid to purchase in each injection *TR zone* and withdrawal *TR zone* referred to in section 4.5.5.1.~~

4.5.6 [Intentionally left blank – section deleted]Where:

~~4.5.6.1 — two or more *TR offerors* submitted *TR offers* relating to different injection *TR zones* and withdrawal *TR zones* such that the *TR offers* may be optimally sold in more than one way;~~

~~4.5.6.2 — the injection *TR zones* and withdrawal *TR zones* referred to in section 4.5.6.1, are linked by a common limiting constraint or constraints; and~~

~~4.5.6.3 — not all of the *transmission rights* offered to be sold in those *TR offers* can be sold,~~

~~the number of *transmission rights* sold by each such *TR offeror* shall be determined by allocating a share of the maximum value of *transmission rights* to each such *TR offeror* in proportion to the value of *transmission rights* that each such *TR offeror* offered to sell in each injection *TR zone* and withdrawal *TR zone* referred to in section 4.5.6.1.~~

4.9 Assignment of Transmission Rights

4.9.5 Where the *IESO* recognizes, for *settlement* purposes, an assignment of the right to all *settlement amounts* under a *transmission right* in accordance with section 4.9.3, the assignee shall be deemed to be the *TR holder* in respect of the *settlement amounts* under that *transmission right* with effect from the *billing period* immediately following the date on which the *IESO* advises the assigning *TR holder* of the results of the *IESO*'s verification pursuant to section 4.9.2 until such time as:

- 4.9.5.1 ~~[Intentionally left blank – section deleted]the *transmission right* has been sold in a *TR auction*; or~~
- 4.9.5.2 the right to the *settlement amounts* under the *transmission right* has been assigned to another *TR participant* and the *IESO* has recognized such assignment for *settlement* purposes in accordance with sections 4.9.2, and 4.9.3 and 4.9.5.

4.11 Long-Term Auctions

- 4.11.3 ~~Subject to section 4.11.4, *long-term auctions* conducted by the *IESO* shall offer *transmission rights* having varying periods of validity of one month or more. The periods of validity of the *transmission rights* awarded during such auctions shall be determined on the basis of a simultaneous consideration of the *TR bids* and the *TR offers* submitted in respect of such *long-term auctions* for all possible combinations of months. [Intentionally left blank – section deleted]~~
- 4.11.4 ~~If the *IESO* cannot, by reason of software inadequacies, implement any *long-term auctions* so as to offer *transmission rights* having varying periods of validity in excess of one month, the *IESO* shall continue to conduct *long-term auctions* in the manner described in section 4.11.2 until such time as the software inadequacies have been rectified. [Intentionally left blank – section deleted]~~
- 4.11.5 Each *long-term auction* referred to in section 4.11.2 ~~and 4.11.3~~ shall consist of multiple rounds. In each case:

- 4.11.8 ~~Subject to section 4.11.9, in the fourth and all subsequent *long-term auctions* conducted by the *IESO*, the *IESO* shall use all available *transmission transfer capability* forecasted in accordance with the operating assumptions established in respect of each such *long-term auction* pursuant to section 4.7.2, adjusted to account for all outstanding *transmission rights*, to define *transmission rights* having varying periods of validity over the course of the year commencing on the first day of the quarter immediately succeeding the quarter in which the *long-term auction* occurs. [Intentionally left blank – section deleted]~~
- 4.11.9 ~~If the *IESO* cannot, by reason of software inadequacies, implement the fourth and any subsequent *long-term auction* so as to offer *transmission rights* having varying periods of validity of one month or more, the *IESO* shall continue to use the methodology set forth in section 4.11.7 until such time as such software inadequacies are rectified. [Intentionally left blank – section deleted]~~

4.13 TR Bids and TR Laminations and TR Offers

- 4.13.1 ~~A *TR participant* may submit no more than one *TR bid* with respect to a given injection *TR zone* and withdrawal *TR zone* for each round of any *TR auction*. A *TR bid* for the purchase of a *transmission right* in a *TR auction* shall indicate A *TR bid* shall conform to the following requirements:~~
- 4.13.1.1 ~~The *TR bid* shall indicate the name of the *TR bidder*, the injection *TR zone* and the withdrawal *TR zone* for each *transmission right* that the *TR bidder* is bidding to purchase, and the round of the *TR auction* to which the *TR bid* relates;~~
- 4.13.1.2 ~~the injection *TR zone* and the withdrawal *TR zone* for each *transmission right* that the *TR bidder* is bidding to purchase. Each *TR bid* must contain at least 1 and may contain up to 20 *TR laminations* for an injection *TR zone* and withdrawal *TR zone*;~~
- 4.13.1.3 ~~the number of *transmission rights* that the *TR bidder* is bidding to purchase. The price in each *TR lamination* shall be a positive amount, be expressed in dollars and whole cents per MW, and represent the maximum~~

price that the *TR bidder* is bidding to purchase the quantity of *transmission rights* identified in the *TR lamination*;

- 4.13.1.4 The quantity in each *TR lamination* shall be a positive amount, not exceed the total amount of *transmission rights* available in the relevant round of the *TR auction*, be expressed in whole numbers, and represent the maximum quantity of *transmission rights* that the *TR bidder* is bidding to purchase at the price identified in the *TR lamination*; and the period of validity of each *transmission right* that the *TR bidder* is bidding to purchase;
- 4.13.1.5 If a *TR bid* is composed of multiple *TR laminations*, such *TR laminations* shall be in monotonically increasing quantities with decreasing prices. the maximum price, in \$/MW, that the *TR bidder* is willing to pay for each *transmission right* that the *TR bidder* is bidding to purchase, which price must be a positive amount; and
- 4.13.1.6 ~~in the case of a *long-term auction* referred to in section 4.11.3, the months of the year for which the *transmission rights* that the *TR bidder* is bidding to purchase must be valid.~~
- 4.13.2 [Intentionally left blank – section deleted]~~A *TR offer* for the sale of a *transmission right* in a *TR auction* shall indicate:~~
- 4.13.2.1 ~~the name of the *TR offeror*;~~
- 4.13.2.2 ~~the injection *TR zone* and the withdrawal *TR zone* for each *transmission right* that the *TR offeror* is offering to sell;~~
- 4.13.2.3 ~~the number of *transmission rights* that the *TR offeror* is offering to sell;~~
- 4.13.2.4 ~~the period of validity of each *transmission right* that the *TR offeror* is offering to sell; and~~
- 4.13.2.5 ~~the minimum price, in \$/MW, that the *TR offeror* is willing to accept for each *transmission right* that the *TR offeror* is offering to sell, which price must be a positive amount.~~
- 4.13.3 [Intentionally left blank – section deleted]~~No *TR offeror* may offer to sell, in a given round of a *TR auction*, any *transmission rights* awarded to that *TR offeror* in a preceding round of the same *TR auction*.~~
- 4.13.5 *TR bids* and ~~*TR offers*~~ shall be submitted to the *IESO* no earlier than 09:00 EST on the date that is two *business days* prior to the date on which a round of a *TR auction* is to

be conducted and no later than 17:00 EST on the day before the date on which the round of the *TR auction* is to be conducted.

4.13.6 ~~[Intentionally left blank – section deleted]The IESO shall not accept a TR offer in respect of the sale of a transmission right unless the TR offeror is the TR holder of record of that transmission right for the entire period during which that transmission right is valid.~~

4.13.7 ~~TR bids and TR offers~~ shall be submitted to the IESO using the *electronic information system* and the communication protocol described in the applicable *market manual*.

4.13.8 The IESO shall:

4.13.8.1 stamp each *TR bid* ~~and TR offer~~ with the time that it was received by the IESO;

4.13.8.2 confirm receipt of each *TR bid* ~~and TR offer~~ within the time specified in the applicable *market manual* using the communication protocol referred to in section 4.13.7; and

4.13.8.3 *publish* and notify *TR participants* of alternative means of submitting and confirming receipt of *TR bids* ~~and TR offers~~ when the communication protocol referred to in section 4.13.7 is unavailable.

4.13.9 The IESO shall reject any *TR bid* ~~or TR offer~~ that does not comply with the rules set forth in this section 4.13 and shall provide the *TR participant* submitting a rejected *TR bid* ~~or TR offer~~ of the reasons for such rejection.

4.13.10 A *TR participant* that does not receive from the IESO confirmation of receipt of a *TR bid* ~~or a TR offer~~ in accordance with section 4.13.8.2 shall immediately contact the IESO by telephone, facsimile or other means specified in the applicable *market manual* seeking confirmation of receipt.

4.13.11 A *TR participant* shall, if requested by the IESO, resubmit a *TR bid* ~~or TR offer~~ by such means as may be specified by the IESO in the request.

4.14 Bidding Limits

4.14.2 The IESO shall refuse to accept a *TR bid* from a *TR bidder* where the price multiplied by the quantity of any TR lamination within the TR bid equals a value which exceeds, if the TR bid were accepted, the aggregate value of all transmission rights awarded to the TR bidder in a given TR auction would exceed the TR bidder's remaining bidding limit after accounting for all other accepted TR bids from such TR bidder in the relevant TR auction.

4.15 TR Market Clearing Prices

4.15.2 The *TR market clearing price* for a given *transmission right* in a given round of a *TR auction* shall be equal to the lowest *bid* price of all *TR laminations* that were awarded *transmission rights*, as determined by Appendix 8.1.

- 4.15.2.1 ~~[Intentionally left blank – section deleted] be equal to the value of any *transmission rights* that would not be awarded to *TR bidders* in that round if the total number of *transmission rights* made available during that round were to decrease by one;~~
- 4.15.2.2 ~~[Intentionally left blank – section deleted] be less than or equal to the maximum price specified in each *TR bid* submitted for the purchase of that *transmission right* if a *TR bidder* was awarded the *transmission right* as a result of that *TR bid*; and~~
- 4.15.2.3 ~~be greater than or equal to the minimum price specified in each *TR offer* submitted for the sale of that *transmission right* if a *TR offeror* was awarded the *transmission right* as a result of that *TR offer*. [Intentionally left blank – section deleted]~~

4.16 Post-Auction Notification and Publication

4.16.1 The *IESO* shall, as soon as practicable and no later than the end of the next *business day* following the conclusion of a round of a *TR auction*, and in any event prior to the time at which *TR bids* ~~and *TR offers*~~ may be submitted in respect of the next round of the *TR auction*, notify each *TR bidder* of the following:

4.16.2 ~~[Intentionally left blank – section deleted] The *IESO* shall, as soon as practicable and no later than the end of the next business day following the conclusion of a round of a *TR auction*, and in any event prior to the time at which *TR bids* and *TR offers* may be submitted in respect of the next round of the *TR auction*, notify each *TR offeror* of *transmission rights* of the following:~~

- 4.16.2.1 ~~the number of *transmission rights* sold by the *TR offeror* during that round;~~
- 4.16.2.2 ~~the *TR market clearing price* of each *transmission right* sold by the *TR offeror* during that round;~~

~~4.16.2.3 the injection *TR zone* and the withdrawal *TR zone* in respect of each *transmission right* sold by the *TR offeror* during that round; and~~

~~4.16.2.4 the period for which each *transmission right* sold by the *TR offeror* during that round was valid.~~

4.16.3 The *IESO* shall, as soon as practicable and no later than the end of the next *business day* following the conclusion of a round of a *TR auction*, and in any event prior to the time at which *TR bids* ~~and *TR offers*~~ may be submitted in respect of the next round of the *TR auction*, publish the following:

4.17 Payment for Purchase/~~Sale~~ of Transmission Rights

~~4.17.2 [Intentionally left blank – section deleted]The amount payable by the *IESO* to a successful *TR offeror* in respect of *transmission rights* sold in a given round of a *TR auction* shall be the aggregate of the *TR market clearing price* of each *transmission right* sold by that successful *TR seller* in that round.~~

4.19 Settlement

4.19.4 All amounts payable to ~~or by~~ the *IESO* on account of the purchase ~~or sale~~ of *transmission rights* in accordance with sections 4.17.1 ~~and 4.17.2~~ in respect of all rounds of a given *TR auction* shall be settled by the *IESO* in accordance with section 6 of Chapter 9.

4.19.5 ~~Where, i~~In respect of a given *TR auction*, the aggregate amount received by the *IESO* in respect of the purchase of *transmission rights* ~~exceeds the aggregate amount payable by the *IESO* in respect of the sale of *transmission rights* in that *TR auction*, the excess~~ shall be used first to repay any short-term funds borrowed by the *IESO* on account of a shortfall referred to in sections 4.19.2 ~~and 4.19.6~~, second, subject to section 4.19.5A, to reimburse *market participants* for funds recovered by the *IESO* under Chapter 9, section 6.16.6.2, on a prorated basis according to, and in an amount that does not exceed, the amount so recovered, third, to replenish the reserve threshold specified in section 4.18.3, and the balance shall remain in the *TR clearing account*.

4.19.5A In the event that the *IESO* cannot, after taking all reasonable steps to do so, locate *market participants* from which funds were recovered by the *IESO* under Chapter 9,

section 6.14.5.2, any amount that would otherwise be distributed to such *market participants* under sections 4.19.3 and 4.19.5 shall remain in the *TR clearing account*.

4.19.6 ~~[Intentionally left blank – section deleted]Where, in respect of a given *TR auction*, the aggregate amount received by the *IESO* in respect of the purchase of *transmission rights* is less than the aggregate amount payable by the *IESO* in respect of the sale of *transmission rights* in that *TR auction*, the shortfall shall be funded first by use of all funds from the *TR clearing account* and then, by the borrowing of short term funds in accordance with section 6.16.5 of Chapter 9.~~

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6.3 Settlement Cycles

6.3.29 The amount of an estimated *invoice* issued to a *market participant* pursuant to section 6.3.27 shall, subject to section 6.3.30, be ~~equal to the aggregate of~~determined in accordance with the following:

6.3.29.1 The amount referred to in section 6.4.2.1, shall be equal to the aggregate of:

6.3.29.1.1 the net total amount for that *market participant* for all *trading days* that occurred during the *energy market billing period* prior to the date on which the issuance of *preliminary settlement statements* commenced to be delayed pursuant to section 6.3.24 or 6.3.25.1, as the case may be;

6.3.29.1.2 for each trading day in the energy market billing period that occurred subsequent to the date referred to in section 6.3.29.1, the net total amount for that *market participant* as set forth in the *final settlement statements* issued to that market participant in the preceding energy market billing *period*, commencing with the *final settlement statement* issued for the last *trading day* of such preceding energy market billing period and using a number of final *settlement statements* equal to the number of *trading days* in the current *energy market billing period* occurring subsequent to the date referred to in section 6.3.29.1; and

6.3.29.1.3 for greater certainty, any net total amount for that *market participant* reflected on a *recalculated settlement statement* which would have otherwise been included on the *invoice* for the relevant *energy market billing period* shall not be reflected on the estimated *invoice*.

6.3.29.2 The amount referred to in section 6.4.2.1, shall be equal to the aggregate of:

6.3.29.2.1 the net total amount for that *market participant* reflected on the relevant post-auction report issued pursuant to section 4.16.1 of Chapter 8 for the aggregate of the amounts for the purchase of *TRs* by the *market participant* in all rounds of any *TR auction* that is concluded within the relevant financial market *billing period*.

6.3.30 Where the data required to determine the amount of an estimated *invoice* in accordance with section 6.3.29.1 is not readily available at the relevant time, the *IESO* shall issue to each applicable *market participant* an estimated *invoice* in an amount equal to:

6.3.30.1 the net amount of the *invoice* issued to the *market participant* for the preceding *energy market billing period* minus any amounts on such *invoice* included on a *recalculated settlement statement*; or

6.3.30.2 zero, if no *invoice* was issued to the *market participant* for the preceding *energy market billing period*.

6.4 Settlement Statement Process

6.4.2.2 the aggregate of the amounts for the purchase ~~or sale~~ of *TRs* in all rounds of any *TR auction* that is concluded on the *trading day*, adjusted to reflect any fees payable by the *market participant* and any other adjustment amounts payable or receivable pursuant to these *market rules*.

6.5 Preliminary Settlement Statement Coverage

6.5.2.3 all fees, charges, credits and payments applicable to the *market participant* in respect of the purchase ~~or sale~~ of a *TR* in all rounds of such *TR auction*; and

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final settlement statement means the IESO's final statement of the payments to be made by or to a *market participant* with respect to a given *billing period* and, in respect of the *settlement* of the purchase ~~or sale~~ of *transmission rights* in the *TR market*, the IESO's final statement of the payments to be made by ~~or to~~ a *TR holder* with respect to a given *TR auction* or the final statement of the payments to be made ~~by or~~ to a *TR holder* with respect to a given *billing period*;

long-term auction means a *TR auction* conducted by the IESO for the purchase ~~and sale~~ of *long-term transmission rights* and that may also include the purchase ~~and sale~~ of *short-term transmission rights*;

preliminary settlement statement means the IESO's preliminary statement of the payments to be made by or to a *market participant* with respect to a given *billing period* and, in respect of the *settlement* of the purchase ~~and sale~~ of *transmission rights* in the *TR market*, the IESO's preliminary statement of the payments to be made by ~~or to~~ a *TR holder* with respect to a given *TR auction* or the preliminary statement of the payments to be made ~~by or~~ to a *TR holder* with respect to a given *billing period*;

short-term auction means a *TR auction* conducted by the IESO for the purchase ~~and sale~~ of *short-term transmission rights*;

TR auction means an auction conducted by the IESO for the purchase ~~and sale~~ of *transmission rights*;

TR bid means a statement of the quantities and prices at which a buyer is willing bid to purchase ~~a~~ transmission rights in a *TR auction*;

TR lamination means a price and an associated quantity that define a "step" in a *TR bid*.

~~*TR offer* means an offer to sell a transmission right in a *TR auction*;~~

~~*TR offeror* means a person offering to sell a transmission right in a *TR auction*;~~

Chapter 2 – Appendices – 2.2

1.3 Dispatch Workstations

- 1.3.1 Each market participant other than a boundary entity, or a capacity auction participant with a capacity obligation through an hourly demand response resource shall, for the purposes of:
- 1.3.1.1 the provision to the *IESO* of real-time information required by the *IESO* to direct the operations of the *IESO-controlled grid*;
 - 1.3.1.2 if the person is or will be subject to dispatch by the *IESO*, the receipt of *dispatch instructions*; and
 - 1.3.1.3 the exchange with the *IESO* of other information required to be submitted or received pursuant to Chapter 7 or Chapter 8, other than the submission, receipt of confirmation of and validation of *dispatch data*, *TR bids* ~~or *TR offers*~~ in the *TR market* and *physical bilateral contract data*, provide, install and maintain a *dispatch workstation* that meets the specifications and other requirements set forth in the *participant technical reference manual* and that is configured to support communication with the real-time communication network channel or channels provided by the *IESO* in the manner described in the *participant technical reference manual*.

Chapter 8 – Appendices

Appendix 8.1 – Mathematical Formulation of the TR Objective Function ~~and Constraints~~

- ~~1.1~~ ~~1.1~~ This Appendix describes the objective function ~~and additional processes~~ used to determine the number of *transmission rights* to be awarded to each *TR bidder*, ~~as described in section 4.5.1 of Chapter 8, and the *TR market clearing price* and sold by each *TR offeror*~~ in a given round of a *TR auction*.
- ~~1.2~~ The objective function, outlined in section 1.3, describes the maximization of the benefit of awarded *TR laminations* net of any unawarded *transmission rights* as determined in accordance with section 1.4(e), if applicable. *Transmission rights* are awarded in quantities to *TR bidders* ranging from zero up to the maximum quantity of their *TR lamination*. The total amount of *transmission rights* awarded to all *TR bidders* in a round of a *TR auction* will not exceed the total number of *transmission rights* available in such round of the *TR auction*. *Transmission rights* will be awarded optimally from highest price to lowest price of the *TR laminations* received for the relevant round of the *TR auction* unless and until such time as there are multiple *TR laminations* that share the same price and cannot all be fully awarded based on the available *transmission rights*.

which shall be resolved in accordance with section 1.4. If there are insufficient transmission rights available to award the entire quantity of a TR lamination and section 1.4 does not apply, such TR bidder shall be awarded the remainder of the transmission rights available. The objective function used for each TR auction has as its mathematical objective the maximization of the benefit, measured in dollars, of the aggregate willingness of successful TR bidders to pay for transmission rights that they have been awarded in a given round of a TR auction, net of the amounts that successful TR offerors were willing to accept for those transmission rights, as constrained by the results of the simultaneous feasibility test required to be conducted in accordance with section 4.6 of this Chapter.

- 1.3 The objective ~~function~~ for each injection TR zone and withdrawal TR zone for each round of a given TR auction is to maximize the following function:

$$\max \sum_{j \in J_r} A_j B_j T_{iwpj},$$

$$Z = \sum_i p_i * q_i$$

where:

- (a) 'Z' is the benefit as described in section 4.5.2 of Chapter 8 for the relevant round of the TR auction;
- (b) 'i' is an index into the set of all TR laminations received for the relevant round of the TR auction;
- (c) 'p_i' is the price of TR lamination 'i', submitted in accordance with section 4.13.1.3 of Chapter 8;
- (d) 'q_i' is the quantity of awarded transmission rights associated with TR lamination 'i', submitted in accordance with section 4.13.1.4 of Chapter 8, where the quantity of awarded transmission rights is determined as follows, as applicable:
 - (i) the sum of all q_i is less than or equal to the fixed amount of transmission rights available for such round of a TR auction that is determined in accordance with section 4.6, 4.7, and 4.11.10, if applicable, of Chapter 8;
 - (ii) where TR lamination 'i' is the highest price TR lamination for such TR bidder and has an associated price is equal to or greater than the TR market clearing price for such round of the TR auction, the entire quantity of the TR lamination or a portion thereof as

determined in accordance with section 1.4, or, where section 1.4 does not apply, the portion that will result in all available transmission rights being awarded;

- (iii) for TR laminations 'i' with a price that is equal to or greater than the TR market clearing price for such round of the TR auction, other than the one referred to in (ii) for the same TR bidder, the quantity that is incremental to the TR bidder's previous TR lamination, as ranked from highest to lowest price, or a portion thereof as determined in accordance with section 1.4, or, where section 1.4 does not apply, the portion that will result in all available transmission rights being awarded; and
- (iv) for TR laminations 'i' with a price that is less than the TR market clearing price for such round of the TR auction, such quantity shall be zero.

J_r is the set of TR bids and TR offers for transmission rights submitted in round *r* of the TR auction;

A_j is the proportion of TR bid *j* that is awarded in the TR auction;

B_j is, in respect of a TR bidder, the maximum price that the TR bidder submitting TR bid *j* offers to pay for a transmission right in that TR bid and, in respect of a TR offeror, is the minimum price that the TR offeror submitting TR offer *j* for that transmission right offers to accept for that transmission right; and

T_{iwpj} is, in respect of a TR bidder, the number of transmission rights associated with injection TR zone *i* and withdrawal TR zone *w* valid in period *p* that the TR bidder submitting TR bid *j* bids to purchase and, in respect of a TR offeror, the number of transmission rights associated with injection TR zone *i* and withdrawal TR zone *w* valid in period *p* that the TR offeror submitting TR offer *j* offers to sell;

subject to the constraint that:

$$0 \leq A_j \leq 1 \text{ for all } j \in J_r,$$

and also subject to the following two additional constraints, each of which must be honoured for every period p in which *transmission rights* available for purchase in the *TR auction* are valid:

$$\sum_{j \in J_r} A_j T_{iwpj} PSF_{iwc} + PT_{iwp} PSF_{iwc} \leq U_{crp} \text{ for all } c \in C^+,$$

and

$$\sum_{j \in J_r} A_j T_{iwpj} NSF_{iwc} + PT_{iwp} NSF_{iwc} \geq L_{crp} \text{ for all } c \in C^-,$$

where:

PSF_{iwc} is the greater of (i) zero and (ii) the shift factor that determines the incremental effect on the flow of power over constraint c that results from an incremental injection at *TR zone i* and an offsetting withdrawal at *TR zone w*;

PT_{iwp} is the number of *transmission rights* associated with injection *TR zone i* and withdrawal *TR zone w* valid in period p that meet the following criteria: (1) they were purchased by or awarded to *TR participants* in a previous *TR auction* or in a round of the *TR auction* conducted before round r ; (2) they have not been sold by their respective *TR holders* in a previous *TR auction* or in a round of the *TR auction* conducted before round r ; and (3) they have not been offered for sale by their respective *TR holders* in round r of the *TR auction*;

U_{crp} is the maximum limit established for the flow of power over constraint c in period p for round r of the *TR auction*;

C^+ is, in respect of the flow of power across an *interconnection*, the set of constraints that specifies a maximum limit on the flow of power over that *interconnection*;

NSF_{iwc} is the lesser of (i) zero and (ii) the shift factor that determines the incremental effect on the flow of power over constraint c that results from an incremental injection at *TR zone i* and an offsetting withdrawal at *TR zone w*;

L_{crp} is the minimum limit established for the flow of power over constraint c in period p for round r of the *TR auction*; and

~~€ is, in respect of the flow of power across an *interconnection*, the set of constraints that specifies a minimum limit on the flow of power over that *interconnection*~~

1.4 Where multiple *TR laminations* share the same price and cannot all be fully awarded based on the available *transmission rights*, the awarding of remaining available *transmission rights* will be determined in accordance with the following:

- (a) First, the *IESO* will award to each tied *TR bidder* their proportional share of the remaining *transmission rights* available, rounded down to nearest whole number. Each *TR bidders* proportional share will be determined based on the quantity of their tied *TR lamination* relative to the amount of all tied *TR laminations*, where the quantity of a tied *TR lamination* that is not the *TR bidders* highest priced *TR lamination* will be the quantity that is incremental to the *TR bidder's* previous *TR lamination*, as ranked from highest to lowest price;
- (b) second, if there continues to be a remainder of *transmission rights* within the relevant round of the *TR auction*, such remainder shall be awarded in accordance with the following:
 - (i) The *IESO* will rank all such *TR bidders* from the highest to lowest based on the difference between the proportional quantity determined in section 1.4(a) prior to being rounded down and the proportional quantity determined in section 1.4(a) that was awarded to such *TR bidder*; and
 - (ii) The *IESO* will award one *transmission right* to each such *TR bidder* in sequence from highest to lowest ranking until either there are no more remaining *transmission rights* to be awarded or one or more such *TR bidders* is tied in their ranking and there are insufficient remaining *transmission rights* to award to them all;
- (c) third, where there are still remaining *transmission rights* following the completion of section 1.4(b), such remainder shall be awarded in accordance with the following:
 - (i) The *IESO* will rank the *TR bidders* whom tied, as contemplated under section 1.4(b)(ii), from highest to lowest based on the quantity of *transmission rights* in their *TR lamination* that is incremental to the *TR*

bidder's previous TR lamination, as ranked from highest to lowest price, if applicable; and

(ii) The IESO will award one transmission right to each such TR bidder in sequence from highest to lowest ranking until either there are no more remaining transmission rights to be awarded or one or more such TR bidders is tied in their ranking and there are insufficient remaining transmission rights to award to them all;

(d) fourth, where there are still remaining transmission rights following the completion of section 1.4(c), such remainder shall be awarded in accordance with the following:

(i) The IESO will rank the TR bidders whom tied, as contemplated under section 1.4(c)(ii), from earliest to latest based on the timestamps of the date and time, to the second, reflecting the time when the TR bidder submits the relevant TR laminations; and

(ii) The IESO will award one transmission right to each such TR bidder in sequence from earliest to latest ranking until either there are no more remaining transmission rights to be awarded or one or more such TR bidders is tied in their ranking and there are insufficient remaining transmission rights to award to them all;

(e) finally, where the remainder of transmission rights within the relevant round of the TR auction are unable to be awarded in accordance with section 1.4(d), such remainder shall not be awarded to any TR bidder.

Appendix 8.2

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