



Transmission Rights

Marketplace Training

January, 2012



Transmission Rights

AN IESO TRAINING PUBLICATION

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1. Introduction

Although there is a uniform energy market price within Ontario, each of the intertie zones can have a different settlement price. This difference is caused by congestion on the interties.

Congestion occurs when the quantity of economic offers or bids exceeds the intertie's physical transfer capability:

- If the price in an intertie zone is lower than the Ontario price, the intertie is import-congested
- If the price in an intertie zone is higher than the Ontario price, the intertie is export-congested

These price differences present a risk to importers and exporters. The transmission rights (TR)¹ market provides a financial hedge against congestion that might otherwise discourage market activity.

We² sell transmission rights through an auction process. TRs entitle the owner to a payment if the price of energy in Ontario is different from the price in an intertie zone. Payouts are specific to the direction of the congestion, for example:

- If the Ontario-Michigan intertie is export congested, transmission rights holders who have Ontario-Michigan path rights will receive payment.
- Holders of any Michigan-Ontario path transmission rights will not receive any payment (nor will they have to pay, as they would in some other markets).

Please note that transmission rights are purely financial instruments and do not guarantee the physical transmission of energy, nor do they affect scheduling.

Objectives

After completing this workbook, you will be able to:

- Describe the differences between long-term and short-term transmission rights
- Describe the criteria for determining how many rights are offered at each auction
- Describe timing of market deposits and explain the impact of cash versus a letter of credit on your bid limit during an auction
- List the criteria for determining the number of transmission rights available for auction on a coupled path
- Given a set of conditions, calculate a transmission rights payout
- Describe the settlement process for transmission rights

¹ In this workbook the terms 'TR' and 'rights' are used interchangeably to mean transmission rights.

² 'We', 'us' and 'our' mean the IESO. 'You' means the market participant.

2. Overview

Who can participate in the TR market?

You must be an authorized market participant to participate in the transmission rights market. There are no other requirements – it is a financial market open even to those who do not participate in the physical markets.

Ownership

We settle TR participants for any rights they purchase in an auction. Although the market rules allow for it, we do not administer a resale market for TRs.

What are the characteristics of TRs?

Path

All transmission rights are sold on a path basis, and are directional. Rights are sold only on paths that are available for physical market bids and offers (certain radial ties are not available for market transactions). The path indicates the injection and withdrawal zone, one of which is always Ontario. We name paths using an abbreviation for Ontario and for each of the intertie zones, where the first term is always the injection zone, for example:

Injection zone	{ ON-MICH }	Withdrawal Zone
e.g. flowing <i>from</i> Ontario		e.g. flowing <i>to</i> Michigan

Owning this transmission right indicates that you anticipate the Michigan interties to be export congested, i.e., a higher energy price in the Michigan intertie zone than Ontario

Size

All transmission rights are sold in 1 megawatt (MW) increments:
1 TR = 1 MW on a given path.

Validity Period (Time Structure)

Transmission rights are sold as either long-term or short-term:

- Long-term rights: valid for all hours of all days for one year
- Short-term rights: valid for all hours of all days for one month

3. Pre-Auction

How do we determine how many rights to auction?

The transmission rights market must be self-funding. The congestion rents collected due to real-time price differences must be sufficient to pay the transmission rights holders on the congested paths.

To avoid overselling a path, the number of transmission rights available for each type of auction is based on the forecast transfer capability, reduced by a confidence level. The confidence level reflects anticipated conditions, equipment outages and system security requirements.

The criteria we use to determine the available rights for sale is different for long-term and short-term auctions, but both are based on the forecast total transfer capability of the interties.

Determining Transmission Transfer Capability (TTC)

The forecast TTC reflects the anticipated scheduling capacity of an intertie, which may be quite different for each direction (import and export). TTC considers anticipated operating conditions, and it respects stability and voltage limits, equipment ratings and operating practices.

- The published transfer capability normally reflects an ‘all equipment in service’ condition – but it may be reduced for long-term outages
- Impractical or emergency modes of operation are excluded from the Quebec intertie TTC calculations
- For interties where the thermal limits are restrictive, there are different limits for summer (April 1– Oct 31) and winter (Nov 1 – March 31)



We publish a *Transmission Rights and Transfer Capabilities* document, which describes the assumptions we use to determine TTC and the base amount of rights available for auction. It is available via a link on the pre-auction TTC reports. Below is an excerpt from this document with example data for the Michigan interface:

Path (circuit considered out of service)	Transmission Rights (summer/winter)		Increments	Transfer Capability (summer/winter) with all elements in service	
	To Ontario	From Ontario		To Ontario	From Ontario
Ontario-Michigan (L4D)	1100/1160	1170/1350	44	1650/1930	2110/2330

- The base quantity is the minimum number of rights sold on a path (combined long-term and short-term) and is derived from the path’s transfer capability with one circuit considered out of service
- This base value represents the minimum amount of rights we can sell on a path and still be confident the market will remain self-funding

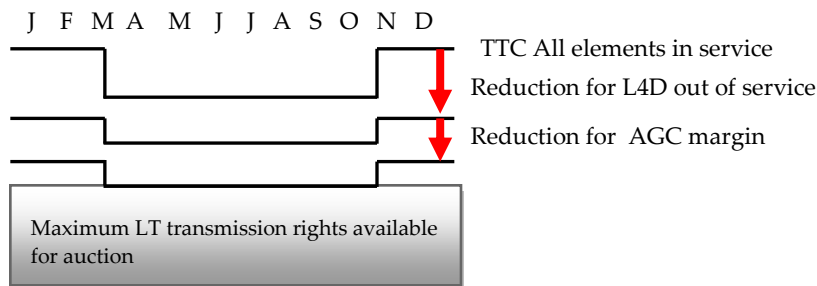
Using the excerpt above, in the summer months the total number of rights offered for sale on the Michigan-Ontario path is at least equal to the base amount (1100), but never more than the TTC (1650) minus any outages or operating and control margins. We publish this ‘maximum transmission rights offered’ quantity in the pre-auction TTC reports.

Long-Term (LT) Rights

The number of transmission rights offered at an auction is limited to the lowest of the summer or winter thermal ratings, stability, or voltage limits. Also:

- For multi-circuit paths, this quantity is limited to the TTC with one circuit out of service, less any operating and control margins, e.g., automatic generation control (AGC) allowance
- For single circuit paths, this quantity is limited to the circuit’s capability less any operating and control margins (e.g., phase shifter deadband) or any lower limit that would result from a single terminal circuit breaker or switch outage
- For radial paths, transfers may be further limited by the amount of load or generation that can be reasonably isolated on the neighbouring system or Ontario

We consider single outages longer than one month when we derive the number of long-term transmission rights for auction. We perform a case-by-case assessment of multiple outages of less than one month– they may impact the number of rights offered at auction.



In our Michigan example above, the maximum number of long-term transmission rights available for auction on the MICH-ON path is 1100 MW. Long-term transmission rights are auctioned quarterly, with approximately 25% of the total available offered at each auction (275 MW in this example).

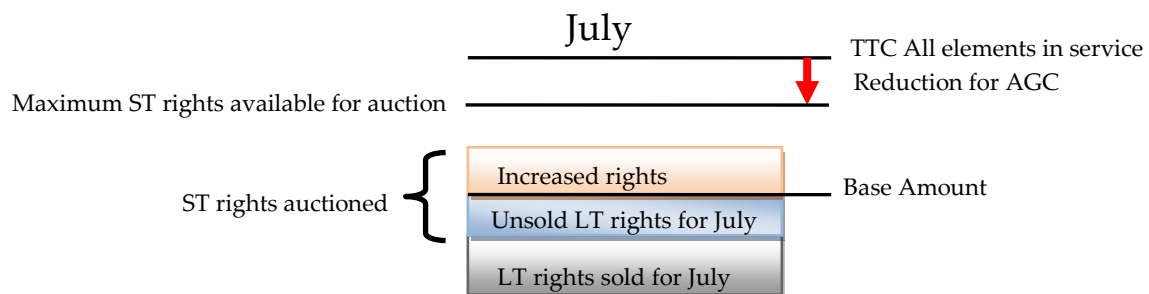
Short-Term (ST) Rights

The number of short-term transmission rights offered at auction is limited by the same criteria as the long-term rights, except:

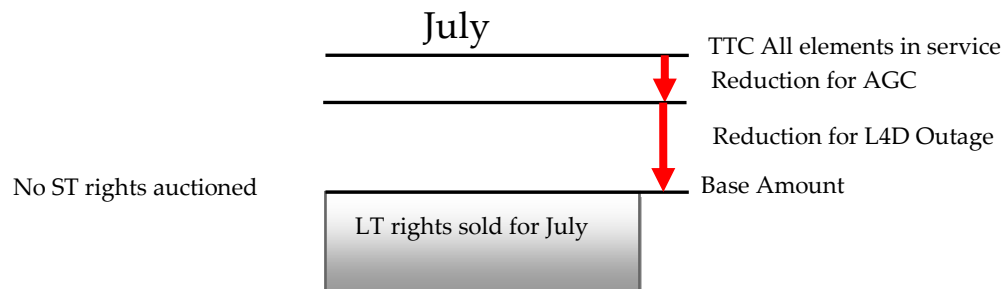
- The quantity offered is limited to the lowest of the monthly thermal ratings, stability or voltage limits
- We consider single outages longer than one week when deriving the short-term auction forecast maximum TTC
- On paths not already at their maximum TTC, the quantity offered will change at quarterly intervals to stabilize the TR clearing account at a level approved by the IESO Board (as described in the next section)

Example 1: Assume there are no outages on the Michigan paths. The number of short-term rights available for the July auction equals:

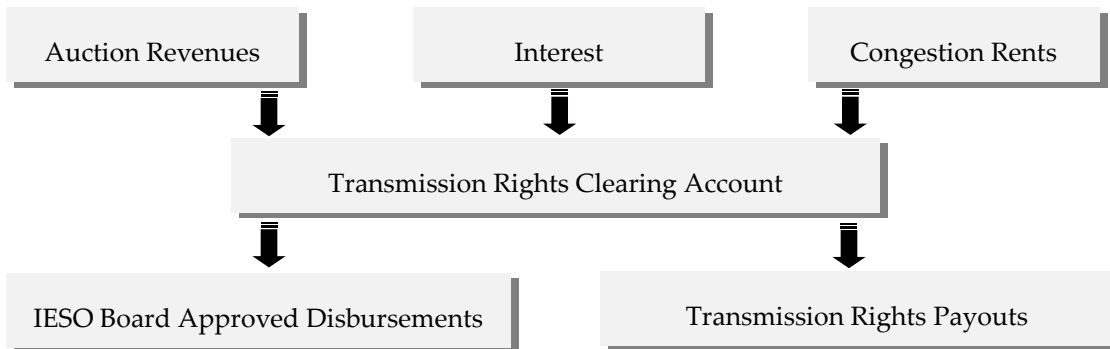
- Unsold long-term (LT) rights from previous auctions covering July (up to the base amount)
- Any increased rights above the base amount to manage the balance in the TR clearing account



Example 2: Assume that circuit L4D is out of service on a planned outage and that there are no unsold LT rights for July. In this case, no ST rights are auctioned for July.



Transmission Rights Clearing Account



The transmission rights clearing account has a threshold set by the IESO Board (\$20 million). We manage fluctuations in the account's balance by adjusting the quantity of short-term transmission rights offered in the following quarter on nine of the paths (as shown in the *Transmission Rights and Transfer Capabilities* document).

Table 1 shows the criteria used to increase or decrease the quantity of short-term rights offered at auction.

Table 2 shows the timing of any adjustments. Surplus amounts in the account are disbursed to loads at the IESO Board's discretion.

The *Monthly Market Report* lists all these components.

Table 1: Criteria for Adjusting Quantity of Short-Term Rights

TR Clearing Account balance	Net TR revenues for preceding 3 months	Effect on short-term rights for multi-element paths
greater than threshold	greater than zero	increase quantity by 4%
greater than threshold	less than zero	stay the same
less than threshold	greater than zero	stay the same
less than threshold	less than zero	decrease quantity by 4%

Table 2: Timing of Adjustments

Time of TR Auction	Net revenues for months considered	Changes apply to these months
January	October, November, December	March, April, May
April	January, February, March	June, July, August
July	April, May, June	September, October, November
October	July, August, September	December, January, February

Example:

Assume:

- The base number of rights remains constant on the MICH-ON path, and
- The TR clearing account criteria have allowed an increase in each of the last four quarters.

The total short-term rights available at the October auction will be 116% of base (base number taken from report excerpt on page 3), i.e., $1100 + (4 \times 44) = 1276$.

Please note that an outage or derating to one of the circuits (e.g., L4D) could reduce the TTC to the point where we offer fewer rights or even no rights, despite what the criteria allow.

4. Auction Process

How do you access the transmission rights auction tool?

You can access the transmission rights auction tool, participant-specific reports, and all related notices and postings through IESO portal. We refer to this as the TRA portal. You can use form 1276 to tell us who you want to have access.

How can you find TR auction timelines?

We publish the annual transmission rights calendar every fall, specifying the dates for the monthly (short-term rights) and quarterly (long-term rights) auction for the next year. The calendar also gives you other important dates in the auction process, such as when the bid window is open and when payment is due. The calendar is available on the *Market Calendars* web page.

Preparing to Bid

The TR market is a financial market, so participant creditworthiness is not managed using the physical market's prudential requirements. Instead, you must post a market deposit in the form of cash or a letter of credit.

- We must receive your market deposit at least 5 business days before an auction or you will receive a notice of rejection (Form 1221) and you will not be able to participate.
- Your bid limit is normally ten times your market deposit, e.g., you can bid for up to \$50,000 of transmission rights if your deposit is \$5,000. We may reduce this multiplier for participants who have previously defaulted. You can view your current bid limit through the TRA portal just prior to an auction.

Pre-Auction Reports

Pre-auction reports are available on both our public website and via the TRA portal. We publish the following reports at least 30 days before an auction

TRA MCP

- Transmission rights market clearing price for every right sold over the last 18 months

Pre-auction TTC

- Maximum rights available for an auction
- Forecast TTC
- A link to the *Transmission Rights and Transfer Capabilities* document, which lists the assumptions used for each path

You can also find reports relevant to transmission rights auctions such as Real-time Market Prices, Intertie Schedule and Flow, and Real-time Intertie Scheduling Limits on the IESO public reports site.

Bidding

- The bid window is open from 09:00 two days before the auction date until 17:00 on the day before the auction date (all times are EST).
- Your bid consists of three elements: path, quantity, and price (\$/MW).
- All bids are time-stamped and you may only have one bid per path at any time, i.e., bids with a later time-stamp will overwrite earlier time-stamped bids.
- You can view, revise and delete your bids via the TRA portal.
- Bids are accepted in real-time, but can be rejected if:
 - The MW of the bid quantity exceeds the maximum MW being offered, or
 - Total cost of all bids (price x quantity) exceeds your bid limit, or
 - Your bid price is not greater than \$0.

Your bid limit is automatically adjusted during auctions to reflect your current bid level.

Long-Term Auctions

Long-term auctions occur quarterly, with approximately 25% of the annual total long-term rights offered at each auction. Since these rights are valid for an entire year, each auction is done in two rounds to allow price discovery:

- The first round is for 25% of the total available for that auction
- The second round is for the remaining 75%

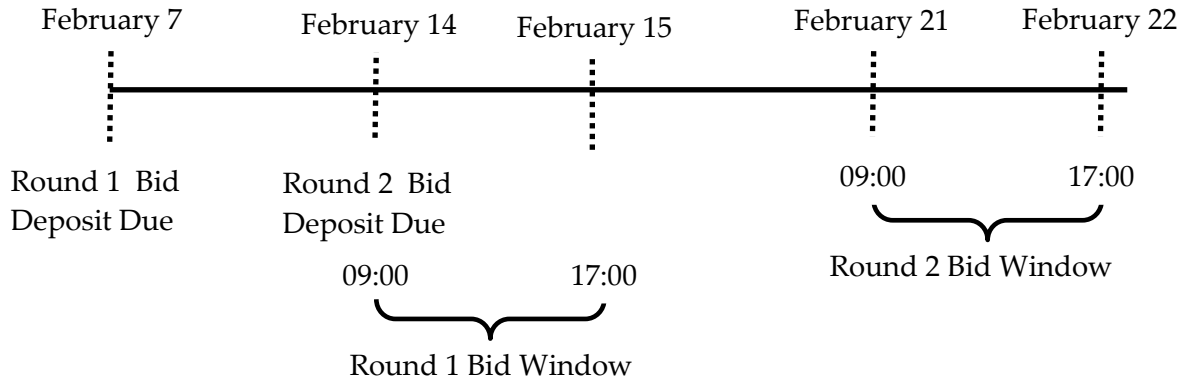
The transmission rights tool and related reports refer to 'round fractions'. A round fraction is the percent (in decimal form) of the rights being offered. So for Round 1 the round fraction is .25 and for Round 2 the round fraction is 1 (that is, 100% of the remaining rights).

Example:

Assume there are 800 MW of MICH-ON long-term rights available for the year:

- 200 MW are auctioned each quarter
- At each auction, 50 MW (round fraction = .25) are offered in Round 1 and the remaining 150 MW (round fraction = 1) are offered in Round 2

Example of the timelines for a February long-term auction:

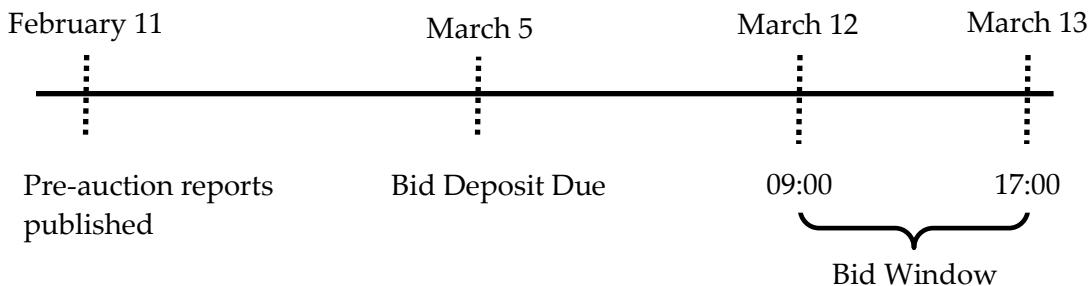


Note that most participants post a large enough market deposit by the Round 1 deadline to meet their anticipated needs for both rounds of a long-term auction.

Short-Term Auctions

Short-term auctions occur monthly and the entire quantity available is offered in one round.

Example of the timelines for a March auction



Treatment of Market Deposits During an Auction

Your bidding limit adjustment during an auction depends on whether it is in the form of a letter of credit or cash.

Letter Of Credit Market Deposit

If your market deposit is a letter of credit, at the end of each auction we will reduce your market deposit by 10% of the value of rights awarded to you, until we receive payment.

Example

You enter a short-term auction with a letter of credit of \$10,000. This means your bidding limit is \$100,000.

If you are successfully purchase \$5,000 worth of TRs in this auction, your deposit is reduced by \$500.00 to \$9,500.00. Reducing the book value of your market deposit gives you a new bidding limit of \$95,000 until you have paid the invoiced amount of \$5,000.

We issue invoices six business days after the end of the trade week in which the awards are made. Until the invoice is issued and paid, the market deposit remains reduced.

Table 3 shows an example of the market deposit management process for letters of credit. Looking at the figures, you can see that the letter of credit deposit is reduced by 10% of the award amount until an issued invoice is paid.

Table 3: Letter of Credit Market Deposit

	Short-Term Auction	Market Deposit / Bid Limit Available Post-Auction	6 Business Days After Trade Week	2 Business Days After Invoice	Market Deposit / Bid Limit After Payment Received
Market Deposit	\$10,000	\$9,500			\$10,000
Bid Limit	\$100,000	\$95,000			\$100,000
Awards	\$5,000				
Book Value of Market Deposit Balance after 10% reduction for awards	\$9,500				
Invoice			\$5,000		
Payment				\$5,000	

Cash Deposits

We deal with cash deposits in a similar manner to letter of credit market deposits. However, at the end of the auction, we apply the deposit to the purchase price of the rights awarded, rather than holding it until an invoice is paid. Where the market deposit is not sufficient to cover the rights awards, the invoice shows the net amount still owing. Table 4 shows the treatment of the cash market deposit.

In the same example of a short-term auction with a starting deposit of \$10,000 and an award of \$5,000, the deposit is applied to the award. In this case, the resulting invoice shows a debit for the \$5,000 and a credit for the same amount. You can elect to have any remaining cash deposit carry forward or be returned after auction. Use Form 1361 to indicate your preference.

Table 4: Cash Market Deposit

	Short-Term Auction	Market Deposit / Bid Limit Available Post-Auction	6 Business Days after End of Week	2 Business Days After Invoice	Market Deposit / Bid Limit After Payment Received
Market Deposit	\$10,000	\$5,000		\$5,000	\$5,000
Bid Limit	\$100,000	\$50,000		\$50,000	\$50,000
Awards	\$5,000				
Adjusted Market Deposit Balance	\$5,000				
Invoice			\$5,000		
Payment			\$5,000		

Looking at the figures in the tables above, you can see that the letter of credit deposit is reduced by 10% of the award amount until an issued invoice is paid. Contrast this to the cash situation in Table 4 where the entire award amount is deducted from the deposit at the end of the auction, reducing the bidding limit for the cash deposit below the bidding limit for the line of credit deposit.

Rounding

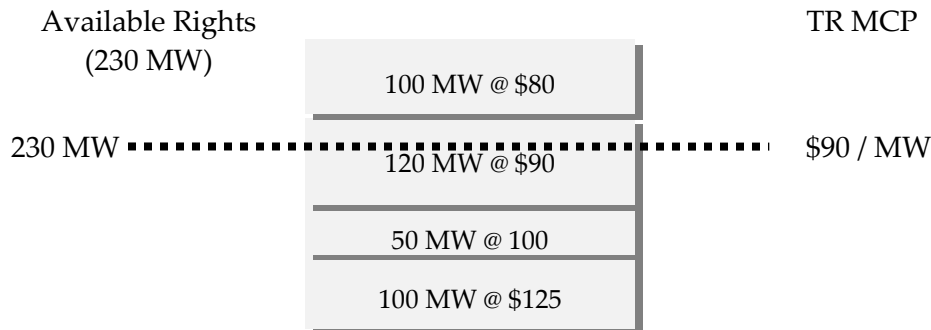
If your initial market deposit was \$10,000 cash and you are awarded \$975.50 in an auction, you would expect your market deposit to be reduced by the amount of your award, or \$975.50, for the purposes of determining the bid limit for the next auction.

That is, you would expect the book value of your TR market deposit to become \$10,000-\$975.50 or \$9,024.50. However, the system cannot accommodate decimals, so we round up all market deposits. In this case, the resulting market deposit is rounded up to \$9,025 and the bid limit after the application of the bid limit multiplier becomes \$90,250.

5. Auction Results: Prices and Awards

Market Clearing Price

Rights are awarded according to the participant's willingness to pay. Bids are stacked, from highest to lowest price and the clearing price is based on marginal cost. For all but the coupled rights (described below) the clearing price is the bid value of the last transmission right (MW) awarded in that auction or round.



Tie-breaking (for uncoupled rights)

Rights are awarded proportionally when two or more participants bid the same price.

Available Rights	Participant	Bid	Award
230 MW	A	90 MW @ \$90	$90/120 \times 80 = 60$ MW
	B	30 MW @ \$90	$30/120 \times 80 = 20$ MW
	C	50 MW @ \$100	50 MW
	D	100 MW @ \$125	100 MW

The auction system rounds down any fractional results as rights are only sold in whole MW increments.

Coupled Transmission Rights

In real-time, transactions scheduled across either the New York or Michigan interties will result in real power flows across both. For example, for a 100 MW transaction (either import or export) across the Ontario/Michigan interface, approximately 75 MW will flow across the Michigan intertie and 25 MW will flow across the New York intertie.

The proportions are reversed for a transaction across the Ontario/New York interface. This means that a transaction across either interface has the potential to result in congestion on both. Sales of New York and Michigan transmission rights are coupled to reflect this interdependency.

For example, the rights sold on the ON-MICH path must respect both the limit for the ON-MICH path and a limit on the ON-NY path that reflects the partial flow of an Ontario to Michigan export on the New York interface. There are two sets of coupled transmission rights:

- Export related: ON-MICH and ON-NY
- Import related: MICH-ON and NY-ON

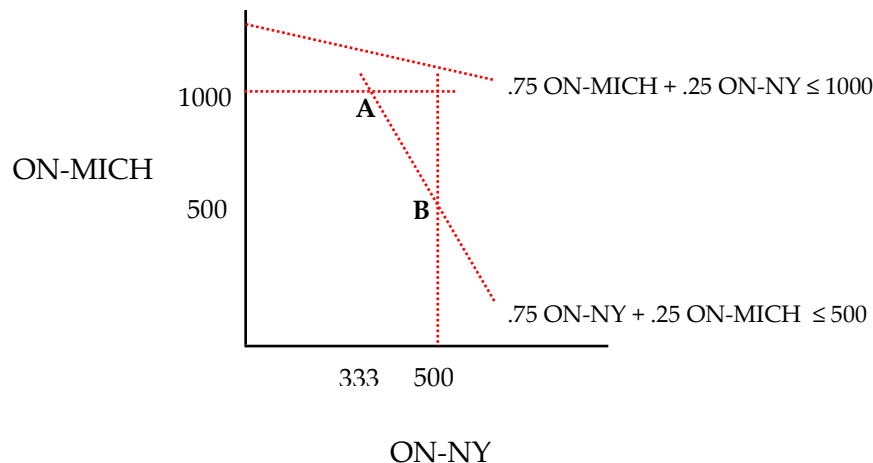
Transmission rights awarded at an auction must follow these rules:

- 100% of ON-MICH TRs sold \leq maximum ON-MICH TRs available
- 75% of ON-MICH TRs sold + 25% of ON-NY TRs sold \leq maximum ON-MICH TRs available
- 100% of ON-NY TRs sold \leq maximum ON-NY TRs available
- 25% of ON-MICH TRs sold + 75% of ON-NY TRs sold \leq maximum ON-NY TRs available

The transmission rights auction algorithm uses these rules and the bid prices to maximize auction revenues when awarding rights. Also, this dependency can result in the market clearing price on a path being set by the value of the coupled path.

Example:

- Maximum ON-MICH TRs available = 1000 MW
- Maximum ON-NY TRs available = 500 MW
- One bid at \$500/MW for 1000 MW of ON-MICH
- One bid at \$700/MW for 500 MW of ON-NY



- The transmission rights auction algorithm would award 1000 MW of ON-MICH and 333 MW of ON-NY, as this results in the greatest auction revenues (A). Awarding one more ON-NY right would result in a revenue gain of \$700, but would require us to award three less ON-MICH rights (revenue loss of \$1500).
- Due to the slope of the constraining equation, the ON-NY bid would need to be greater than three times the ON-MICH bid ($3 \times \$500$) to result in all 500 MW of available ON-NY rights being awarded (B). There would only be 500 MW of associated ON-MICH rights awarded under this scenario.

In this example, there was only one bid on each path. In a normal auction with multiple bidders, structuring your bids with a 3:1 ratio between the two interfaces does not guarantee you will be awarded any rights, i.e., you may be outbid by another participant on one or both interfaces.

Tie-breaking

Using the example above: what happens if Participant A bids \$1500 for the ON-NY path and Participant B bids \$500 for the ON-MICH path? There are many solutions that would result in the same auction revenue. The TR algorithm will award the rights in the same ratio as the constraint relationship, in other words 1 MW ON-NY for every 3 MW on the ON-MICH path.

Post-Auction Reports

There are two types of post-auction reports: public and participant-specific. Both are published within one day of the auction (usually within one hour). Public reports are available on both our public website and via the TRA portal. Participant-specific reports are only available via the TRA portal.

Public Reports

TR Post Auction MCP

- The quantities sold and clearing price for each of the paths sold in that auction

Participant Specific Reports

Auction Results

- Your bid price and quantity as well as the clearing price and quantity awarded to you for each path successfully bid upon – this report will indicate if you have no winning bids

Bid History

- Your bid history over the last 18 months

6. Settlement

TR Payout

Payment for TRs occurs when there is congestion on an intertie. This congestion is reflected in different prices in Ontario and an intertie zone. Payouts are always positive and you must hold the right that is in the same direction as the congestion to receive payment.

$$\text{TR Payout} = \text{MAX}(0, \text{Price in Withdrawal Zone} - \text{Price in Injection Zone})$$

Assume the Michigan/Ontario interface is export congested:

- Participant A holds 100 TRs on the MICH – ON path
- Participant B holds 100 TRs on the ON – MICH path
- MICH intertie zone price is \$60
- ON zone price is \$50

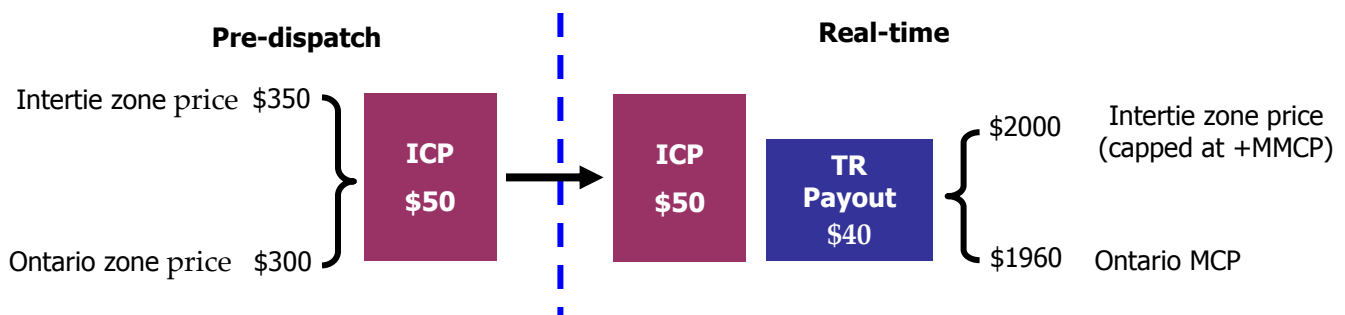
Participant A does not receive any payout since their TR hedges import congestion

$$\begin{aligned} \text{TR Payout} &= \text{MAX}(0, \$50 - \$60) \\ &= 0 \end{aligned}$$

Participant B receives a payout since their TR hedges export congestion

$$\begin{aligned} \text{TR Payout} &= \text{MAX}(0, \$60 - \$50) \\ \text{Total Payout} &= \$10 \times 100 \\ &= \$1,000 \end{aligned}$$

Note that most of the time the TR payout will equal the intertie congestion price (ICP)³ calculated in pre-dispatch. The exception to this is when either zone's price is at the boundary of +MMCP or -MMCP. For example, if the ICP was \$50 and the real-time Ontario price was \$1960, the TR payout would be limited to \$40, as the intertie zone price cannot exceed \$2,000.



³ For more information on intertie pricing, see the *Interjurisdictional Energy Trading* workbook, available on the [Marketplace Training](#) web pages.

For a complete outage to an intertie, ICP and TR payouts are set to zero. If the outage occurs partway through an hour, TR holders will receive a payout for the portion of the hour when the intertie was in service (provided there is an ICP). Also, during an administrative pricing event, TR payouts are based on the difference between the administered intertie zone price and the administered Ontario price, which may be different from the ICP created in pre-dispatch. (See *Quick Take 4: Administrative Pricing*)

Statements and Invoices

Transmission rights use both the financial and physical market settlement processes:

- Payment for rights purchased in an auction are settled in the financial market
- Payout to TR holders is settled in the physical market

(For more information on the settlement process see the *Commercial Reconciliation* workbook or recorded presentation, available on the [Marketplace Training](#) web pages). Please note that you retrieve statements and invoices from the IESO Reports site. They are published according the schedule shown on the *Financial and Physical Market Settlement Schedule and Payment Calendars* on the *Market Calendars* web page. The settlement timelines for each of the markets is shown below:

Item	Timing	
	Physical Market	Financial Market
Preliminary Settlement Statement	10 business days after trading day	2 business days after trading day
Time to file a Notice of Disagreement	4 business days after the preliminary settlement statement is issued	2 business days after preliminary settlement statement is issued
Final Settlement Statement	20 business days after trading day	6 business days after trading day
Billing Period	Trading month	Trading week (Sunday to Saturday)
Invoice	10 business after the last trading day in the month	6 business days after the end of the trading week (a Monday unless there is a holiday in the week)
Payment	Payments to IESO within 2 business days of invoice issue Payments from IESO to participants within 4 business days of invoice issue	Payments to IESO within 2 business days of invoice issue

Participants who do not pay their TR invoice by the due date will lose their awarded rights and will receive a notice of revocation (Form 1374). We may also require them to use cash market deposits in the future or may reduce their bid limit from 10 times the deposit to something smaller. We do not award forfeited rights to the next highest bidder, but instead we sell them in a future auction.

7. Additional Information

References

- Market Rules, Chapter 8, Section 4 *The Transmission Rights Market*
- Market Manual 4.4 *Transmission Rights Auction*
- Transmission Rights Auction System - Market Participant User Guide (IMO_GDE_0004)

Tool Simulations

The following simulations are available via the [Marketplace Training](#) web pages:

- Logging on to the Portal
- View a Future Transmission Rights Auction
- Submit a Transmission Rights Auction Bid
- Revise a Transmission Rights Auction Bid
- Retrieve Transmission Rights Confidential Reports

8. Skill Check

Skill Check Questions

1. Which of the following statements are True?
 - a) Short-term rights are valid for all hours of all days for one quarter of the year.
 - b) Transmission rights are sold in 10 MW increments
 - c) To avoid overselling a path, the number of transmission rights available for an auction is based upon the forecast transfer capability, reduced by a confidence level.
 - d) We consider outages longer than one week when we derive the number of long-term transmission rights for auction

2. If your market deposit is \$900, which of the following are valid bids?
 - a) 100 MW @ \$100
 - b) 100 MW @ \$0
 - c) 100 MW @ \$80
 - d) 50 MW @ \$80

3. If the TR Clearing Account balance is greater than zero, and the net TR revenues for the preceding 3 months are positive, which of the following statements is True?
 - a) Short-term rights available on multi-element paths at the next auction will increase by 4%
 - b) Short-term rights available on multi-element paths at the next auction will decrease by 4%
 - c) Short-term rights available on multi-element paths at the next auction will not change
 - d) Long-term rights available on multi-element paths at the next auction will not increase by 4%

4. If you own 100 MW of MICH-ON TRs, and the settlement prices are \$100 in Ontario and \$95 for the Michigan intertie zone, what is your TR payout?

5. If your market deposit is a letter of credit for \$10,000 and you are awarded \$5,000 of TRs, your new bid limit is \$95,000. What would be your new bid limit if you had a cash deposit instead?

6. Which of the following statements is False?

- a) 100% of ON-MICH TRs sold \leq maximum ON-MICH TRs available
- b) 25% of ON-MICH TRs sold + 75% of ON-NY TRs sold \leq maximum ON-MICH TRs available
- c) 100% of ON-NY TRs sold \leq maximum ON-NY TRs available
- d) 25% of ON-MICH TRs sold + 75% of ON-NY TRs sold \leq maximum ON-NY TRs available

7. How many days after an auction is the invoice posted?

- a) 6 days
- b) 4 business days
- c) 6 business days
- d) 2 business days

Skill Check Answers

1. Which of the following statements are True?

- a) Short-term rights are valid for all hours of all days for one quarter of the year.
- b) Transmission rights are sold in 10 MW increments
- c) **To avoid overselling a path, the number of transmission rights available for an auction is based upon the forecast transfer capability, reduced by a confidence level.**
- d) We consider outages longer than one week when we derive the number of long-term transmission rights for auction

2. If your market deposit is \$900, which of the following are valid bids?

- a) 100 MW @ \$100
- b) 100 MW @ \$0
- c) **100 MW @ \$80**
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3. If the TR Clearing Account balance is greater than zero, and the net TR revenues for the preceding 3 months are positive, which of the following statements is True?

- a) **Short-term rights available on multi-element paths at the next auction will increase by 4%**
- b) Short-term rights available on multi-element paths at the next auction will decrease by 4%
- c) Short-term rights available on multi-element paths at the next auction will not change
- d) Long-term rights available on multi-element paths at the next auction will not increase by 4%

4. If you own 100 MW of MICH-ON TRs, and the settlement prices are \$100 in Ontario and \$95 for the Michigan intertie zone, what is your TR payout?

$$\begin{aligned}\text{TR Payout} &= \text{MAX}(0, \text{Price in Withdrawal Zone} - \text{Price in Injection Zone}) \\ &= \text{MAX}(0, \$100 - \$95) \\ &= \$5 \times 100 \\ &= \mathbf{\$500}\end{aligned}$$

5. If your market deposit is a letter of credit for \$10,000 and you are awarded \$5,000 of TRs, your new bid limit is \$9,500. What would be your new bid limit if you had a cash deposit instead?

\$50,000

6. Which of the following statements is False?

- a) 100% of ON-MICH TRs sold \leq maximum ON-MICH TRs available
- b) **25% of ON-MICH TRs sold + 75% of ON-NY TRs sold \leq maximum ON-MICH TRs available**
- c) 100% of ON-NY TRs sold \leq maximum ON-NY TRs available
- d) 25% of ON-MICH TRs sold + 75% of ON-NY TRs sold \leq maximum ON-NY TRs available

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