Real-Time Intertie Offer Guarantee

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Introduction

Import transactions not scheduled by the DAM but which are scheduled by the last pre-dispatch run before the start of the dispatch hour (i.e., imports submitted after the DAM or any DAM-offered quantities which were subsequently scheduled) can receive a real-time intertie offer guarantee (RT-IOG). This guarantee ensures importers do not suffer a negative operating profit should settlement prices be below their offer price. This is required because intertie transactions are scheduled ahead of the dispatch hour, but their settlement is based on real-time prices.

Background

Scheduling Interchange

The Ontario energy market allows market participants to import power from and export power to other jurisdictions. Because the source (or destination in the case of exports) is outside the Ontario control area, imports and exports cannot be dealt with in the same way as internal supply and demand. These interjurisdictional transactions can have widespread impact, affecting more than just our immediately interconnected neighbours. Reliability standards must be maintained and adjacent market protocols followed, which results in a complex, time-consuming coordination process.

Because of this process, imports and exports are scheduled an hour in advance for an hour at a time, rather than for the five-minute intervals used for internal dispatchable facilities. This means that an import scheduled to flow between 11:00 and 12:00 will be locked in shortly after 10:00, during the hour-ahead pre-dispatch run of the scheduling algorithm.

Settlement Pricing and Intertie Price Risk

Intertie energy locational marginal prices (LMPs)[1] are comprised of the Intertie Border Price (IBP) plus the Intertie Congestion Price (ICP). The IBP is the locational marginal price (LMP) at the Ontario

[1] For more information on pricing at the interties, please see the Interjurisdictional Energy Trading workbook available on the Marketplace Training pages of the IESO website.

side of an intertie. As such, it includes the Ontario reference price plus the costs of congestion and losses between the reference bus and the intertie with the external jurisdiction. The ICP is the cost of external congestion (that is, on the intertie between Ontario and the neighbouring jurisdiction) plus any costs associated with a binding Net Intertie Scheduling Limit (NISL).

Day-ahead market (DAM) and pre-dispatch prices are set using the IBP plus the ICP. Because intertie transactions are locked in for the same quantity across each interval of the dispatch hour, the real-time market (RTM) calculates an IBP but does not itself calculate an ICP. Real-time uses the ICP from the last pre-dispatch in a dynamic intertie settlement pricing process. This means that real-time settlement pricing depends on whether the intertie was congested or not in the final pre-dispatch run:

- If there was no congestion (external congestion or a binding NISL) in pre-dispatch the ICP is zero. As such the settlement price is the IBP as calculated in real-time.
- If there was export congestion (i.e., the ICP was negative), the price is the sum of the five-minute real-time intertie border prices and the pre-dispatch ICP.
- If there was import congestion (i.e., the ICP was positive), the price is the lesser of the pre-dispatch intertie LMP, or the five-minute real-time IBPs.

Price Risk Due to the Scheduling Process

Importers flow for all twelve 5-minute intervals of a dispatch hour, while their schedule is set in advance and does not change during real-time. As such, they may have been economic in pre-dispatch but face the risk that real-time prices drop below their offer price. The example below illustrates this point:

Participant A offers to import 100 MWh of energy into Ontario for the hour 11:00 to 12:00 at a price of $50.

At approximately 10:00 a.m., the IESO completes a pre-dispatch run of the scheduling algorithm. The pre-dispatch intertie LMP price for the next hour (i.e., 11:00 to 12:00) is $60, comprising an IBP of $60 and an ICP of $0. At this price, the import is economic and is accepted to flow.

Once the import offer is accepted and scheduled by pre-dispatch, it is locked in for the dispatch hour 11:00 to 12:00. As such, the supplier is committed to flow that energy. Once it has been scheduled, only the IESO can modify this transaction, and only for reliability reasons.

The import is settled based on the real-time energy price for the intertie zone. If the real-time price averages to only $40 during the hour, the importer will receive less than their offer price. This represents a price risk and potential loss for the importer.

Real-Time Intertie Offer Guarantee

A key market design principle is to ensure that the adequacy of supply is not adversely affected by the features of the market. The price risk represented by how imports are scheduled and settled might discourage these transactions in the absence of a market mechanism to counter that risk. Since imports represent additional supply, this could adversely affect adequacy. The RT-IOG is

intended to reduce this price risk. The RT-IOG ensures that, over the course of the hour, an energy importer will receive at least the average price of their offer, i.e., they will not suffer a negative operating profit. Please note this holds true even if the real-time intertie zone LMP is negative. IOG payments themselves are never negative – they are either zero or some positive amount.

There is no equivalent guarantee for day-ahead scheduled imports because these schedules are financially binding. Therefore, day-ahead-scheduled imports are inherently compensated at the day-ahead price negating the need for an additional guarantee.

RT-Intertie Offer Guarantee Offset Process

Because RT-IOGs are meant to encourage energy flows into Ontario, the RT-IOG calculation process offsets real-time import transactions for other transactions by the same market participant which reduce the net inflow into the province, such as linked wheeling through transactions[2], exports scheduled by the same market participant on the same intertie in the same hour, and day-ahead market scheduled imports. The RT-IOG offset process is conducted for each market participant who traded on an intertie in a settlement hour. The process has twelve steps, as discussed below:

[2] For more information on linked wheel-through transactions, please see the Interjurisdictional Energy Trading workbook available on the Marketplace Training pages of the IESO website.

Step 1: By trader, identify for each hour of a day all energy import and export transactions whether scheduled in the DAM or in the real-time market (i.e., by the last pre-dispatch before the start of the hour).

As an example, assume an energy trader scheduled the following transactions for the same dispatch hour:

	Boundary Entity Resource	MW	Intertie	Neighbouring Electricity System[3]	Linked Wheels
RT Imports	Res 1	120	PQQC	HQ	
	Res 4	450	PQBE	HQ	
	Res 5	100	MBSI		
	Res 9	100	MBSI		
	Res 10	100	MBSI		NERC Tag: WI prefix
RT Exports	Res 6	100	MNSI		
	Res 7	100	MBSI		
	Res 8	100	PQXY	HQ	
	Res 12	100	MBSI		NERC Tag: WX prefix
	Res 14	20	PQQC	HQ	
DAM Imports	Res 11	50	PQQC	HQ	
	Res 2	100	MBSI		
	Res 3	100	MNSI		
	Res 4	50	PQBE	HQ	
	Res 9	100	MBSI		
DAM Exports	Res 6	50	MNSI		
	Res 13	50	MNSI		

[3] Only Quebec is currently recognized as a neighbouring electricity system for purposes of RT-IOG offsets. This is because each intertie with Quebec is transacted on separately, unlike other interfaces.

Step 2: Identify and remove all day-ahead market and RTM linked wheeling through transactions.

In the example, the NERC Tag for Res 10 started with WI and the NERC Tag for Res 12 started with WX, indicating they constitute a linked wheel. As such, they are removed from further steps.

This leaves:

	Boundary Entity Resource	MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	120	PQQC	HQ	
	Res 4	450	PQBE	HQ	
	Res 5	100	MBSI		
	Res 9	100	MBSI		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	Res 6	100	MNSI		
	Res 7	100	MBSI		
	Res 8	100	PQXY	HQ	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	Res 14	20	PQQC	HQ	
DAM Imports	Res 11	50	PQQC	HQ	
	Res 2	100	MBSI		
	Res 3	100	MNSI		
	Res 4	50	PQBE	HQ	
	Res 9	100	MBSI		
DAM Exports	Res 6	50	MNSI		
	Res 13	50	MNSI		

Step 3: Reduce RTM-scheduled energy import transactions by any DAM-scheduled energy import transaction quantities for the same resource. This establishes the maximum RTM-scheduled amount for each transaction.

In the example, Res 4 was the only resource scheduled in both the DAM and the RTM. Its RTM quantity of 450 MW is reduced by its DAM-scheduled quantity of 50 MW to 400 MW.

Now, calculate the Potential IOG (P-IOG) for each energy import transaction scheduled in the RTM using its RTM quantity. The P-IOG is the maximum possible RT-IOG settlement amount the transaction could receive prior to reductions for IOG Offsets.

$$\text{Potential IOG} = -1 \times \text{Min}[0, \sum\text{OP}(\text{RT\_LMP}, \text{SQEI}, \text{BE}) - \sum\text{OP}(\text{RT\_LMP}, \text{Min}[\text{SQEI}, \text{DAM\_QSI}], \text{BE})]/12$$

This means the P-IOG for each interval in an hour is equal to the lesser of zero or the sum of the transaction's RTM operating profit or the sum of the transaction's operating profit based on the lesser of its real-time schedule or its DAM schedule, all divided by 12.

Let's look at Res 4 as an example. Res 4 was scheduled to 50 MW in the DAM and 450 MW by the last pre-dispatch before the start of the dispatch hour. Assume the resource offered in the RTM at $40 and that the RTM PQBE intertie LMP was $20 for all intervals. Using the above formula:

RES 4 P-IOG = -1 x Min {[0, ($20 – $40) X 450 – [($20 - $40) x Min (450, 50)]} / 12

= -1 x Min [0, (-$20 x 450) – (-$20 x 50)] / 12

= -1 x Min [0, -$9000 – (-$1000)] / 12

= -1 x -$8,000 /12

= $666.666667

Since the real-time intertie LMP was $20 for all intervals, the P-IOG for Res 4 is $8,000.

Let's look at Res 9. This transaction was scheduled to 100 MW in the DAM and 100 MW by the last pre-dispatch before the start of the dispatch hour. Assume it was offered in the RTM at $50 and that the RTM MBSI intertie LMP was $50 for all intervals. Using the above formula:

RES 9 P-IOG = -1 x Min {[0, ($50 – $50) X 100 – [($50 - $50) x Min (100, 100)]} / 12

= -1 x Min [0, ($0 x 100) – ($0 x 100)] / 12

= -1 x $0 /12

= $0

Since the transaction was offered at $50 and the RTM intertie LMP was $50 for all intervals, and since it was scheduled for the same quantity in the DAM and the RTM, overall, the P-IOG for Res 9 is $0.

Assume this process was repeated for each Res in the example resulting in the following P-IOGs:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Potential IOG
RT Imports	Res 1	120	PQQC	HQ	$1,200
	Res 4	~~450~~400	PQBE	HQ	$8,000
	Res 5	100	MBSI		$3,000
	Res 9	~~100~~	MBSI		$0

The next three steps establish the order in which the IOG Offsets will be applied

Step 4: Calculate the RT-IOG rate ($/MW) for each RTM-scheduled energy import transaction. The RT-IOG rate is equal to the transaction's Potential IOG divided by its real-time MW schedule, or:

$$\text{P-IOG} / \text{SQEI}$$

Continuing with the example, the RT-IOG rates are:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Potential IOG	RT_IOG Rate ($/MW)
RT Imports	Res 1	120	PQQC	HQ	$1,200	$10
	Res 4	~~450~~ 400	PQBE	HQ	$8,000	$20
	Res 5	100	MBSI		$3,000	$30
	Res 9	~~100~~	MBSI		$0	$0

Step 5: Remove all energy import transactions with a RT-IOG rate of $0/MW.

In the example, Res 9 was the only one with an RT-IOG Rate of $0/MW, so it is removed. This leaves:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	120	PQQC	HQ	
	Res 4	~~450~~ 400	PQBE	HQ	
	Res 5	100	MBSI		
	~~Res 9~~	~~100~~	~~MBSI~~		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	Res 6	100	MNSI		
	Res 7	100	MBSI		
	Res 8	100	PQXY	HQ	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	Res 14	20	PQQC	HQ	
DAM Imports	Res 11	50	PQQC	HQ	
	Res 2	100	MBSI		
	Res 3	100	MNSI		
	~~Res 4~~	~~50~~	~~PQBE~~	~~HQ~~	
	~~Res 9~~	~~100~~	~~MBSI~~		
DAM Exports	Res 6	50	MNSI		
	Res 13	50	MNSI		

Step 6: Sort energy import transactions in ascending RT-IOG rate order. This determines the order sequence of the offset process.

Continuing the example:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Potential IOG	RT_IOG Rate ($/MW)
RT Imports	Res 1	100	PQQC	HQ	$1,200	$10
	Res 4	~~450~~ 400	PQBE	HQ	$8,000	$20
	Res 5	100	MBSI	Manitoba	$3,000	$30

Step 7: Determine each trader's incremental RTM-scheduled energy export transactions for each hour by subtracting the quantity of DAM-scheduled exports from the quantity of RTM-scheduled exports. Any incremental RTM-scheduled energy export transactions are carried forward to the next steps. Any DAM-scheduled exports without a corresponding RTM export are set to 0 MW. This allows later steps to offset RTM imports with RTM-only exports.

In the example, Res 6 and Res 13 were DAM scheduled exports:

Energy Transactions	Res 6
RT Export Schedule	100 MW
DAM Export Schedule	50 MW
Offset MW	50 MW
Remaining RT Export Quantity	**50 MW**

Energy Transactions	Res 13
RT Export Schedule	0 MW
DAM Export Schedule	50 MW
Offset MW	50 MW
Remaining RT Export Quantity	**0 MW**

Res 6 is reduced to 50 MW, which is its RTM-scheduled quantity. Res 13 is removed entirely because it did not have corresponding RTM transaction MWs.

This leaves:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	120	PQQC	HQ	
	Res 4	~~450~~ 400	PQBE	HQ	
	Res 5	100	MBSI		
	~~Res 9~~	~~100~~	~~MBSI~~		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	Res 6	~~100~~ 50	MNSI		
	Res 7	100	MBSI		
	Res 8	100	PQXY	HQ	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	Res 14	20	PQQC	HQ	
DAM Imports	Res 11	50	PQQC	HQ	
	Res 2	100	MBSI		
	Res 3	100	MNSI		
	~~Res 4~~	~~50~~	~~PQBE~~	~~HQ~~	
	~~Res 9~~	~~100~~	~~MBSI~~		
DAM Exports	~~Res 6~~	~~50~~	~~MNSI~~		
	~~Res 13~~	~~50~~	~~MNSI~~		

Following the completion of Steps 1 to 7, IOG Offset MWs are determined at the intertie level (Step 8), neighbouring electricity system level (Step 9) and the IESO-control area (Ontario) level (Step 10).

Step 8: At the intertie level:

Reduce RTM-scheduled import MWs by any MWs scheduled by an energy trader on the same intertie in the DAM but not in the RTM:

a) Offset RTM-scheduled import transaction MWs with the energy quantities of import transactions scheduled in the DAM but not in the RTM starting with the RTM-scheduled import with the lowest RT-IOG rate.

b) Repeat Step 8:1a for each intertie, in ascending order of RT-IOG rate.

c) The remaining quantity of energy for any import transaction scheduled in the DAM or in the RTM that was not fully offset, or was not subject to offset at this step, is carried forward to the next steps.

In the example, two interties had imports scheduled in the DAM which were not scheduled in the RTM:

Energy Transactions	PQQC
RTM Import Res 1	120 MW
DAM Import Res 11	50 MW
Offset MW	50 MW
Remaining RT Import Quantity	**70 MW**

Energy Transactions	MBSI
RTM Import Res 5	100 MW
DAM Import Res 2	100 MW
Offset MW	100 MW
Remaining RT Import Quantity	**0 MW**

Offset import MWs scheduled by an energy trader in the RTM with the MW quantity of any exports scheduled by that energy trader in the DAM on the same intertie.

a) For the energy import transaction with the lowest RT-IOG rate scheduled in the RTM, offset the quantities of energy of export transactions also scheduled in the RTM.

b) Repeat Step 8:2a for each intertie, in ascending order of RT-IOG rate.

c) The remaining quantity of energy for any RTM-scheduled import or export transaction that was not fully offset, or was not subject to offset at this step, is carried forward to the next steps.

In the example, Res 14 on PQQC is a RTM-scheduled export. It offsets against real-time import Res 1 on the same intertie.

Energy Transactions	PQQC
RT Import Res1	70 MW
RT Export Res14	20 MW
Offset MW	20 MW
Remaining RT Import Quantity - Res1	**50 MW**

This leaves:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	~~120~~ 50	PQQC	HQ	
	Res 4	~~450~~ 400	PQBE	HQ	
	~~Res 5~~	~~100~~	~~MBSI~~		
	~~Res 9~~	~~100~~	~~MBSI~~		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	Res 6	~~100~~ 50	MNSI		
	Res 7	100	MBSI		
	Res 8	100	PQXY	HQ	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	~~Res 14~~	~~20~~	~~PQQC~~	~~HQ~~	
DAM Imports	~~Res 11~~	~~50~~	~~PQQC~~	~~HQ~~	
	~~Res 2~~	~~100~~	~~MBSI~~		
	Res 3	100	MNSI		
	~~Res 4~~	~~50~~	~~PQBE~~	~~HQ~~	
	~~Res 9~~	~~100~~	~~MBSI~~		
DAM Exports	~~Res 6~~	~~50~~	~~MNSI~~		
	~~Res 13~~	~~50~~	~~MNSI~~		

Step 9: Perform the following IOG offset at the neighbouring electricity system level:

1. For energy import transactions with the same neighbouring electricity system, reduce any RTM-scheduled import transactions by the quantity of any DAM-scheduled import transactions which were not also scheduled in the RTM.

a) For the RTM-scheduled import transaction with the lowest RT-IOG rate, offset the energy quantities of DAM-scheduled import transactions which were not scheduled in the RTM. This adjusts the quantity of the RTM-scheduled import transactions to be net of DAM-scheduled transactions.

b) Repeat Step 9:1a for each neighbouring electricity system, in ascending order of RT-IOG rate.

c) The remaining quantity of energy for any import transaction scheduled in the DAM or in the RTM that was not fully offset, or was not subject to offset at this step, is carried forward to the next steps.

In the example, there are no DAM import MWs remaining that are scheduled on the same neighbouring electricity system. Therefore, no additional RT-IOG Offsets in this step.

Offset import MWs scheduled by an energy trader in the RTM with the MW quantity of any exports scheduled by that energy trader to the same neighbouring electricity system.

a) For the energy import transaction with the lowest RT-IOG rate scheduled in the RTM, offset the quantities of energy of RTM-scheduled export transactions to the same jurisdiction.

b) Repeat Step 9:2a for each neighbouring electricity system, in ascending order of RT-IOG rate.

c) The remaining quantity of energy for any RTM-scheduled import or export transaction that was not fully offset, or was not subject to offset at this step, is carried forward to the next steps.

Energy Transactions	HQ
RT Import - Res 1	50 MW
RT Export - Res 8	100 MW
Offset MW	50 MW
Remaining RT Import - Res 1	**0 MW**
RT Import – Res 4	400 MW
Remaining RT Export – Res 8	50 MW
Offset MW	50 MW
Remaining RT Import - Res 4	**350 MW**

This Leaves:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	~~120~~ ~~50~~	PQQC	~~HQ~~	
	Res 4	~~450~~ 350	PQBE	HQ	
	~~Res 5~~	~~100~~	~~MBSI~~		
	Res 9	100	MBSI		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	Res 6	~~100~~ 50	MNSI		
	Res 7	100	MBSI		
	~~Res 8~~	~~100~~	~~PQXY~~	~~HQ~~	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	~~Res 14~~	~~20~~	~~PQQC~~	~~HQ~~	
DAM Imports	~~Res 11~~	~~50~~	~~PQQC~~	~~HQ~~	
	~~Res 2~~	~~100~~	~~MBSI~~		
	Res 3	100	MNSI		
	~~Res 4~~	~~50~~	~~PQBE~~	~~HQ~~	
	~~Res 9~~	~~100~~	~~MBSI~~		
DAM Exports	~~Res 6~~	~~50~~	~~MNSI~~		
	~~Res 13~~	~~50~~	~~MNSI~~		

Step 10: Perform the IOG offset at the IESO control area (Ontario) level.

2. Identify the remaining RTM-scheduled energy import transactions and the remaining DAM-scheduled energy import transactions which were not also scheduled in the RTM.

In the example, the following import and export transactions are still available for possible offset:

Energy Transaction	Res 4 PQBE	Res 6 MNSI	Res 3 MNSI	Res 7 MBSI
RT Import MW	350			
DAM Import MW			100	
RT Export MW		50		100

a) For the RTM-scheduled energy import transaction with the lowest RT-IOG rate, offset with the quantities of DAM-scheduled energy import transactions which did not have a corresponding RTM import transaction.

Energy Transaction	MWs
RT Import - Res 4	350
DAM Import - Res 3	100
Remaining RT Import Quantity - Res 4	**250**

b) Repeat Step 10:1a in ascending order of RT-IOG rate.

c) The remaining quantity of energy for any import transaction scheduled in the RTM that was not fully offset, or was not subject to offset at this step, will be carried forward to the next steps.

3. Identify energy import and export transactions scheduled in the RTM.

   a. Offset the RTM-scheduled energy import transaction with the lowest RT-IOG rate by the quantities of RTM-scheduled energy export transactions.

   b. Repeat Step 10:2a in ascending order of RT-IOG rate.

   c. The remaining quantity of energy for any RTM-scheduled import transaction that was not fully offset is included in determining the IOG Offset MWs.

This leaves:

	Boundary Entity Resource	Offset MW	Intertie	Neighbouring Electricity System	Linked Wheels
RT Imports	Res 1	~~120 50~~	PQQC	HQ	
	Res 4	~~450 350 200~~ 100	PQBE	HQ	
	~~Res 5~~	~~100~~	~~MBSI~~		
	~~Res 9~~	~~100~~	~~MBSI~~		
	~~Res 10~~	~~100~~	~~MBSI~~		~~NERC Tag: WI prefix~~
RT Exports	~~Res 6~~	~~100 50~~	~~MNSI~~		
	~~Res 7~~	~~100~~	~~MBSI~~		
	~~Res 8~~	~~100~~	~~PQXY~~	~~HQ~~	
	~~Res 12~~	~~100~~	~~MBSI~~		~~NERC Tag: WX prefix~~
	~~Res 14~~	~~20~~	~~PQQC~~	~~HQ~~	
DAM Imports	~~Res 11~~	~~50~~	~~PQQC~~	~~HQ~~	
	~~Res 2~~	~~100~~	~~MBSI~~		
	~~Res 3~~	~~100~~	~~MNSI~~		
	~~Res 4~~	~~50~~	~~PQBE~~	~~HQ~~	
	~~Res 9~~	~~100~~	~~MBSI~~		
DAM Exports	~~Res 6~~	~~50~~	~~MNSI~~		
	~~Res13~~	~~50~~	~~MNSI~~		

Step 11: Determine the IOG Offset MWs for each remaining eligible RTM scheduled energy import transaction.

In the example, only Res 4 has remaining MWs. Its RTM-scheduled amount incremental to its DAM schedule is 400 MW. It was not offset at the Intertie Level, but it was offset by 50 MW at the Neighbouring System Level and by 250 MW at the Ontario Control Area Level for a total IOG Offset quantity of 300 MW.

Boundary Entity Resource ID	RT-IOG RATE ($/MW)	SQEI used Potential IOG (MW)	IOG Offset at Intertie Level (MW)	IOG Offset at Jurisdiction Level (MW)	IOG Offset at Ontario Level (MW)	IOG Offset Quantity (MW)
Res 4	$20	400	0	50	250	**300**

Step 12: Determine the IOG Offset ($) for each eligible energy import transaction scheduled in the RTM. This is calculated as follows:

$$\text{IOG Offset} = \text{Offset MW} \times \text{IOG Rate}$$

In the example, only Res 4 has an IOG Offset Quantity:

IOG Offset = Offset MW x IOG Rate

= 300 MW x $20/MW

= $6,000

Intertie Offer Guarantee Calculations

The RT-IOG settlement amount for each eligible energy import transaction is determined as follows:

$$\text{RT\_IOG} = \text{Max}(0, \text{Potential IOG} - \text{IOG Offset})$$

In the example, only Res 4 is left. Recall that it had a P-IOG of $8,000. Therefore:

RT_IOG Res 4 = Max (0, Potential IOG – IOG Offset)

= Max (0, $8,000 - $6,000)

= Max (0, $2,000)

= $2,000

Additional Resources

Training Materials are available on the IESO Marketplace Training web page:

- Introduction to Ontario's Physical Markets
- IESO Charge Types and Equations (available on the Technical Interfaces page)

Contact Us

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