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# Market Renewal – Energy Project: External Congestion and NISL Congestion Cost Residual Collection and Disbursement

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# Meeting Purpose and Audience

**Purpose:** To inform stakeholders of the design for the collection and disbursement of external and net interchange scheduling limit (NISL) congestion cost residuals incurred in the future day-ahead market (DAM) and real-time market (RTM)

**Audience:** Transmission rights (TR) market participants, intertie traders and stakeholders interested in market efficiency.

# Meeting Agenda

## **Agenda:**

- Background: Residuals and outstanding design decisions
- Collection and disbursement of DAM external congestion cost residuals
- Collection and disbursement of RTM external congestion cost residuals
- Collection and disbursement of DAM NISL congestion cost residuals
- Collection and disbursement of RTM NISL congestion cost residuals

## Background: MRP High Level and Detailed Design

The MRP high level design and detailed design identified two changes impacting future TR market settlement:

- The future intertie prices will include the NISL component; and
- Future TRs will be paid out using the external congestion component of day-ahead intertie prices instead of real-time intertie prices

## Background: Residual Collection and Disbursement

- When scheduling limits such as import limits, export limits and NISL bind (i.e. their cost components have a non-zero value), residuals can occur - meaning charges to loads and/or exporters do not equal payments to suppliers and/or importers
- The IESO must be revenue neutral and disburse residuals back to market participants

## Example: Residual Collection and Disbursement

Assume for a given hour in the DAM:

- Three exports are each scheduled for 500 MW
- One import is scheduled for 800 MW
- NISL congestion component is \$10, indicating a need to limit the amount of net exports to respect a NISL of 700 MW


This results in a NISL over-collection and residual disbursement scenario:

- Charges to exporters =  $\$10 \times 1,500 \text{ MW} = \$15,000$
- Payments to importers =  $\$10 \times 800 \text{ MW} = \$8,000$ .
- Results in an over-collection of \$7000 to be disbursed

## Background: Outstanding MRP Design Decisions

The following design decisions were put on hold until the TR Market Review stakeholder engagement was completed:

1. How to collect and disburse external congestion cost residuals in the DAM
2. How to collect and disburse incremental external congestion cost residuals in the RTM, relative to the DAM
3. How to collect and disburse NISL congestion cost residuals in the DAM
4. How to collect and disburse incremental NISL congestion cost residuals in the RTM, relative to the DAM




# Collection and Disbursement of DAM External Congestion Cost Residuals



# DAM External Congestion Collection and Disbursement

- Future DAM external congestion cost residuals will be collected into the Transmission Rights Clearing Account (TRCA) as they are today for RTM external congestion cost residuals
- Surplus residuals left from settling the TR market (i.e. DAM external congestion residuals collected plus TR auction revenues less TR market payouts) will continue to be disbursed from the TRCA to loads and exporters as they are today
- TRCA disbursement will continue to occur every 6 months when the TRCA is in excess of \$5M above the reserve threshold of \$20M
- In other words: NO CHANGE FROM TODAY



# Collection and Disbursement of RTM External Congestion Cost Residuals

# RTM External Congestion Residual Collection

- RTM external congestion cost residuals can occur when a DAM intertie limit binds in the RTM or when a binding DAM intertie limit changes in RTM
- Example: A non-congested 400 MW intertie limit in the DAM becomes import congested in the RTM:

Transaction	DAM Schedule	RTM Schedule	RTM External Congestion Cost	RTM External Congestion Residual*
Export 1	200 MWh	200 MWh	-\$10	\$2,000
Import 1	0 MWh	200 MWh		
Import 2	400 MWh	400 MWh		

**\*RTM External Congestion Residual** = [(Sum of RTM Exports – Sum of DAM Exports) – (Sum of RTM Imports – Sum of DAM Imports)] x RTM External Congestion Cost

- This results in an over-collection of \$2000 in the RTM

## RTM External Congestion Residual Collection (cont'd)

- A new month end uplift calculation, referred to as Real-Time External Congestion Uplift (RTECU), will be used to collect RTM external congestion cost residuals for each hour of the RTM
- RTECU residuals for each hour will be accumulated over the monthly settlement cycle

## RTECU Disbursement

RTECU disbursement will follow the same methodology used for the TRCA since RTM external congestion is the real-time equivalent of DAM external congestion, except on a monthly basis vs. a TRCA 6-month, surplus basis:

1. At the month end settlement process, the IESO will first divide the RTECU balance between loads and exporters based on their proportion of transmission service charges paid over the past month
2. The RTECU balance allocated to loads will be disbursed to each load based on their proportionate share of monthly metered consumption in the RTM
3. The RTECU balance allocated to exporters will be disbursed to each exporter based on their proportionate share of monthly schedules in the RTM

## Example: RTECU Disbursement

- Assuming a monthly RTECU over-collection of \$10,000 and the following monthly transmission service charges, monthly load consumption and monthly export schedules, the disbursement would be:

Participant	Monthly Transmission Service Charges per Class	RTECU Share per Class	Monthly RTM Consumption/Schedule per Participant	Total Monthly RTM Consumption/Schedule per Class	RTECU Disbursement
Export 1	\$500 (9%)	$0.09 \times \$10,000 = \$900$	200 MW	300 MW	$200 \text{ MW} / 300 \text{ MW} \times \$900 = \$600$
Export 2			100 MW		$100 \text{ MW} / 300 \text{ MW} \times \$900 = \$300$
Load 1	\$5,000 (91%)	$0.91 \times \$10,000 = \$9,100$	1000 MW	1750 MW	$1000 \text{ MW} / 1750 \text{ MW} \times \$9,100 = \$5,200$
Load 2			500 MW		$500 \text{ MW} / 1750 \text{ MW} \times \$9,100 = \$2,600$
Load 3			250 MW		$250 \text{ MW} / 1750 \text{ MW} \times \$9,100 = \$1,300$



# Collection and Disbursement of DAM NISL Congestion Cost Residuals

# DAM NISL Congestion Residual Collection

- DAM NISL congestion cost residuals can only occur when the NISL limit is binding for any hour of the DAM (i.e. NISL congestion component is non-zero)
- Example: For HE1, NISL is binding with a congestion component of \$10, indicating a need to limit net exports to respect a NISL of 700 MW:

Transaction	DAM Schedule	DAM NISL Congestion Cost	DAM NISL Congestion Residual*
Export 1	600 MWh	\$10	\$7,000
Export 2	600 MWh		
Import 1	500 MWh		

**\*DAM NISL Congestion Residual** = (Sum of DAM Exports – Sum of DAM Imports) x DAM NISL Congestion Cost

- This results in an over-collection of \$7,000 for HE1



## DAM NISL Congestion Residual Collection (cont'd)

- A new daily uplift calculation, referred to as the Day-Ahead NISL Congestion Uplift (DNCU), will be used to collect DAM NISL congestion cost residuals for each hour of the DAM
- DNCU residuals for each hour will be accumulated over the 24 hours of the DAM, consistent with collection of all other DAM uplift calculations

# DNCU Disbursement

- DNCU residuals will be disbursed daily to all loads and exports based on their proportionate share of total consumption in the RTM for the same day of the DAM, consistent with other DAM uplift disbursements
- Example: Assuming a DNCU balance of \$7000 and the following daily RTM load consumption and export schedules, the DNCU disbursement would be:

Participant	Participant's Daily RTM Consumption	Daily Ratio (Participant Daily RTM Consumption / Total RTM Consumption)	DNCU Disbursement (Daily Ratio X DNCU)
Export 1	7,200 MWh	$7200 / 86400 = 8\%$	\$583
Export 2	7,200 MWh	$7200 / 86400 = 8\%$	\$583
Load 1	24,000 MWh	$24,000 / 86400 = 28\%$	\$1,944
Load 2	48,000 MWh	$48,000 / 86400 = 56\%$	\$3,889



# Collection and Disbursement of RTM NISL Congestion Cost Residuals

## RTM NISL Congestion Residual Collection

- RTM NISL congestion cost residuals can only occur when NISL changes between the DAM and RTM (i.e. NISL congestion component is non-zero)
- Example: Assuming a NISL limit increase from 700 MW in the DAM to 800 MW in RTM allows for an additional 100 MW from Export 3 to be scheduled

Transaction	DAM Schedule	RTM Schedule	RTM NISL Congestion Cost	RTM NISL Congestion Residual*
<b>Export 1</b>	600 MWh	600 MWh	\$25	\$2500
<b>Export 2</b>	600 MWh	600 MWh		
<b>Import 1</b>	500 MW	500 MW		
<b>Export 3</b>	0 MW	100 MW		

\***RTM NISL Congestion Residual** = [(Sum of RTM Exports – Sum of DAM Exports) – (Sum of RTM Imports – Sum of DAM Imports)] x RTM NISL Congestion Cost

- This results in an over-collection of \$2,500

## RTM NISL Congestion Residual Collection (cont'd)

- A new hourly uplift calculation, referred to as the Real-Time NISL Congestion Uplift (RNCU), will be used to collect RTM NISL congestion cost residuals for each hour of the RTM
- Hourly collection is consistent with the collection of all other RTM uplifts

# RNCU Disbursement

- RNCU residuals will be disbursed hourly to all loads and exports based on their proportionate share of consumption in that hour of the RTM, consistent with other RTM hourly uplift disbursements
- Example: Assuming an HE1 RNCU balance of \$2500 and the following HE1 RTM load consumption and export schedules, the RNCU disbursement would be:

Participant	Participant's RTM Consumption for HE1	Hourly Ratio (Participant Hourly RTM Consumption / Total RTM Consumption for HE1)	RNCU Disbursement for HE1 (Hourly Ratio X RNCU)
Export 1	600 MWh	600 MWh / 4300 MWh = 14%	\$349
Export 2	600 MWh	600 MWh / 4300 MWh = 14%	\$349
Export 3	100 MWh	100 MWh / 4300 MWh = 2%	\$58
Load 1	1,000 MWh	1000 MWh / 4300 MWh = 23%	\$581
Load 2	2,000 MWh	2000 MWh / 4300 MWh = 47%	\$1163

# Summary and Next Steps

## Summary:

- Collection and disbursement design decision summaries:

	<b>DAM External Congestion Residuals</b>	<b>RTM External Congestion Residuals</b>	<b>DAM NISL Congestion Residuals</b>	<b>RTM NISL Congestion Residuals</b>
Collection Method	As per current TRCA collection	Hourly	Hourly	Hourly
Disbursement Method	As per current TRCA disbursement	Monthly	Daily	Hourly

- Collection and disbursement methods are consistent with existing and future market disbursements

## Next Steps:

- Collection and disbursement decisions to be codified as part of the market rules and manuals batch for market settlements

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# Thank You

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