

Congestion Rents and Loss Residual Zonal Disbursement Methodology

Energy Workstream SE Meeting
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Agenda

- Recap on Residuals
- Analysis
 - Part 1: Residual Disbursement Methodology
 - Part 2: Frequency of Residual Disbursement
- Revised Decision
- Next Steps

Recap – Residuals

- In a SSM, suppliers and loads can be exposed to different prices, which result in more money collected from consumers than is paid to suppliers
 - This differential is commonly because of transmission congestion
- Annual congestion rents and loss residuals (i.e., residuals) were, on average, \$116M/year based on 2014-2017 data
- Given how Ontario has invested in transmission, residuals should be returned directly to consumers

Recap – Proposed Preliminary Decision for Zonal Residual Disbursement

- IESO had initially proposed* a Relative Zonal Price disbursement methodology with residuals returned to loads in zones with zonal prices that were higher than the supplier weighted average price in a given month
 - The IESO proposed this method to be temporary given the possibility for participant behaviour to be affected by a monthly distribution
- Stakeholder feedback indicated that a temporary residual disbursement methodology would bring uncertainty to the market
- The IESO has analysed alternative zonal residual disbursement methodologies (Part 1) and alternative frequencies of residual disbursement (Part 2) that could be used as an enduring residual disbursement approach

Revised Decision for Zonal Residual Disbursement

- Based on qualitative and quantitative analyses, the IESO has revised its initial proposal for a zonal residual disbursement methodology:

Part 1: The IESO proposes continuing with its previous decision– to use a Relative Zonal Price residual disbursement methodology. This method returns residuals to zones with prices that are higher than the supplier weighted average price during the allocation period

Part 2: The IESO proposes calculating and distributing residuals among loads in those zones on a quarterly basis

Part 3: The IESO proposes this approach to be a permanent solution

Part 1: Methodology for Zonal Residual Disbursement - Introduction to Analysis

- The IESO analysed three methodologies for residual disbursement in order to explore potential alternatives to the proposed Relative Zonal Price methodology:
 - Relative Zonal Price (IESO-Proposed)
 - Volumetric
 - Expenditure-based
- Zonal residual disbursement methodology comparison
 - Quantitative analysis using 2014-2017 historical data to compare price outcomes under different zonal residual disbursement methodologies
 - Qualitative evaluation of different zonal residual disbursement methodologies against the five Market Renewal Principles*

* The IESO and stakeholders worked closely together to establish [Market Renewal Principles](#) (please see Appendix for the principles' definitions)

Part 1: Considered Methodologies for Zonal Residual Disbursement

Zonal Residual Disbursement Methodology			
	Relative Zonal Price (IESO-Proposed)	Volumetric	Expenditure-based
How are the residuals disbursed?	Only to zones which have a higher load-weighted price than the system-wide supply-weighted price, proportional to the zones' expenditure	To all zones proportional to respective zonal consumption, i.e., zonal consumption relative to total Ontario demand	To all zones proportional to respective total zonal energy charges, i.e., zonal total energy costs relative to total Ontario energy costs
What zones receive residuals?	Only zones with prices that are higher than the supplier weighted average price	All zones, with larger share of residuals going to the zones with higher levels of total zonal consumption	All zones, with larger share of residuals going to the zones with higher levels of total zonal energy costs

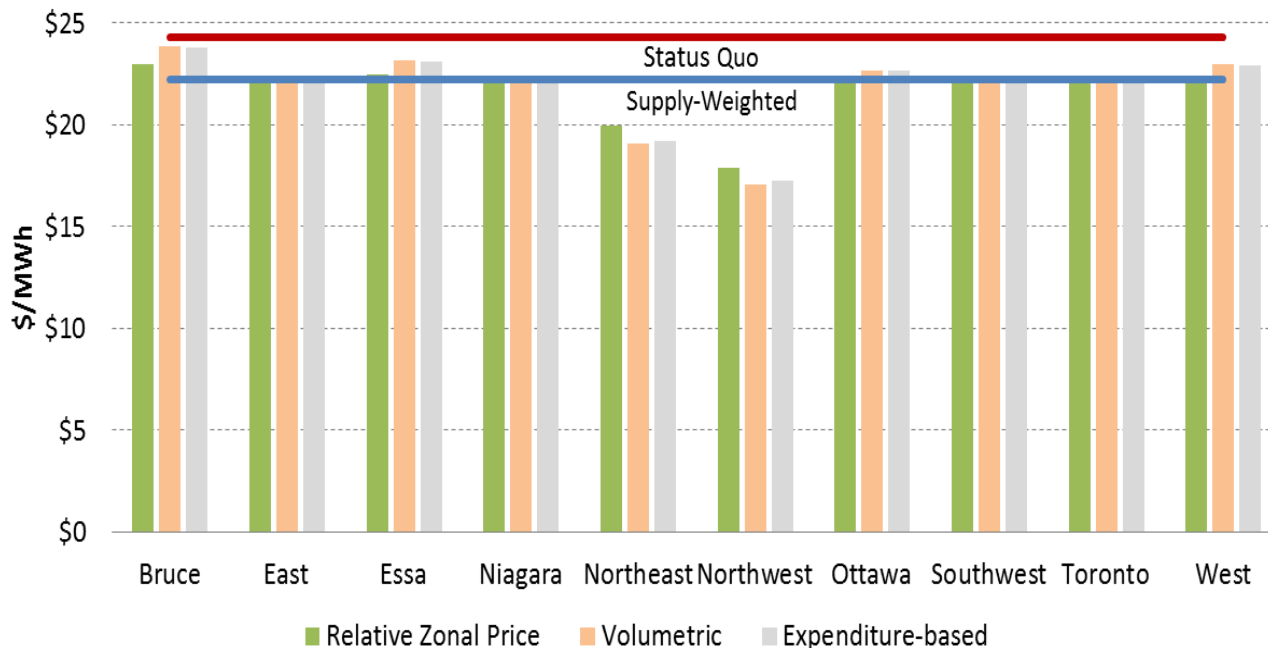
Part 1: Residual Disbursement Methodology

– Efficiency Impact

- The residual disbursement methodology can affect long-run efficiency
 - Long-run (LR) efficiency is about enabling consumers to value the usage of energy in the future and decide whether to decrease or increase their consumption for the long-term
 - Some decrease in LR efficiency is likely through any disbursement mechanism. The IESO has weighed that potential decrease with the intention to provide residuals to loads affected by congestion
 - The IESO recognizes that wholesale electricity prices are only one factor among many that can inform long-term investment decisions
- Long-term **average** post-rebate prices should reflect the overall locational supply/demand condition

Part 1: Residual Disbursement Methodology – Quantitative Comparison

Post-rebate Price - Annual Disbursement
Comparison of the Residual Disbursement Methodologies



Status quo: HOEP + CMSC + losses
 Supply-weighted average: SSM with uniform pricing

- All three methodologies result in a lower price outcome for all zones compared to Status Quo
- For most zones, post-rebate zonal prices are in line with a SSM supply-weighted average price
- Volumetric and Expenditure-based methodologies result in similar post-rebate prices

* Please note that throughout this presentation a “Post-rebate” price refers to a price after residuals are allocated; a “Pre-rebate” price refers to a price before residuals are allocated.

Part 1: Residual Disbursement Methodology

– Qualitative Evaluation

Market Renewal Principles	Zonal Residual Disbursement Methodology		
	Relative Zonal Price	Volumetric	Expenditure-based
Efficiency	●	■	●
Competition	●	●	●
Implementability	■	●	●
Certainty	■	■	■
Transparency	■	■	■

■ - Satisfies; ● - Neutral/Somewhat satisfies

Part 1: Residual Disbursement Methodology

– Revised Decision

- Based on the quantitative and qualitative evaluation the Relative Zonal Price methodology is the IESO's preferred method for an enduring residual disbursement approach
 - Allocating on the basis of Relative Zonal Price is an effective way to address the move away from province-wide pricing for wholesale loads - while still encouraging the efficiency benefits of zonal pricing
 - The IESO will continue to examine the interaction between nodal/zonal load pricing and the residual disbursement in detailed design

Part 2: Frequency of Residual Disbursement

- Introduction to Analysis

- The IESO further analysed four frequencies of residual calculation and disbursement in order to explore potential efficiency improvements to the proposed Relative Zonal Price methodology:
 - Monthly
 - Quarterly
 - Semi-annual*
 - Annual
- Frequency of Residual Disbursement comparison
 - Quantitative analysis using 2014-2017 historical data to compare price outcomes under different residual calculation and disbursement frequencies
 - Qualitative evaluation of different frequencies of calculation and disbursement against five Market Renewal Principles

* Seasonal disbursement as per currently-defined seasons in Ontario market: May to Oct, and Nov to Apr

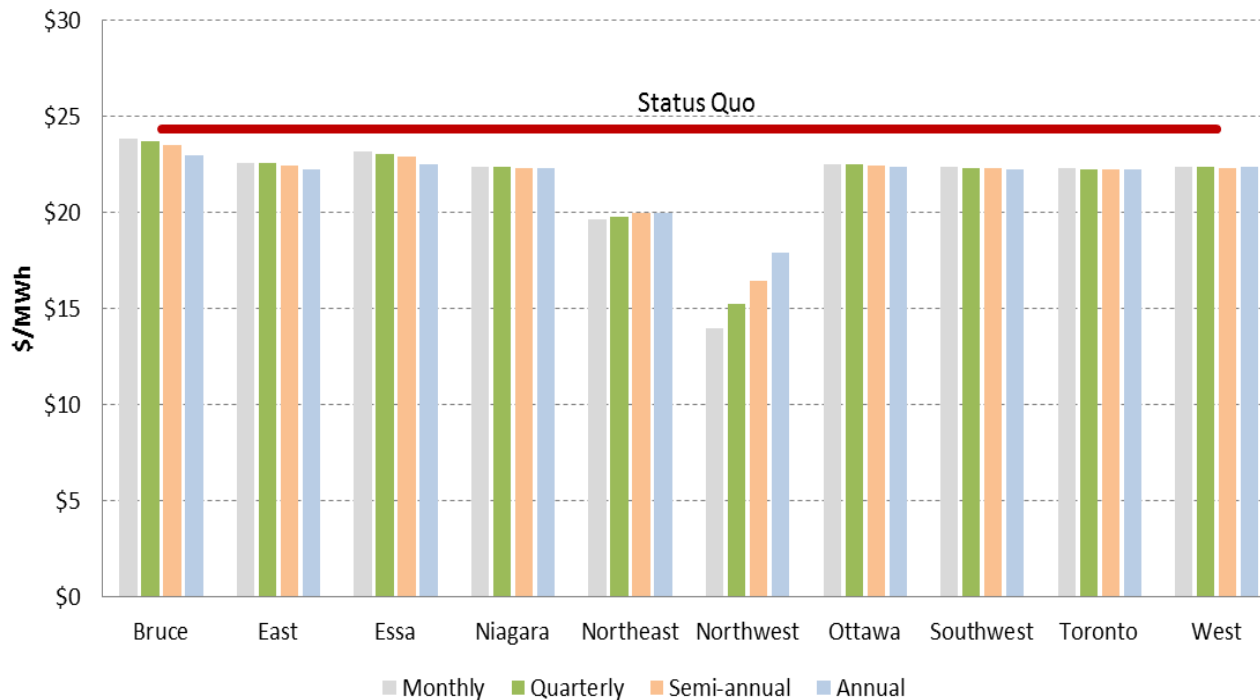
Part 2: Frequency of Residual Disbursement

– Efficiency Impact

- The frequency of residual calculation can affect short-run efficiency
 - Short-run (SR) efficiency depends on providing consumers with a price signal that reflects the marginal/incremental cost of energy at a given time and location
- The chosen frequency should aim to preserve the incentives provided by the locational marginal price
 - The marginal price signal is better preserved when the residual calculation and disbursement is less frequent
 - This is because marginal prices are known at the time of consumption, while post-rebate average prices are not immediately observed and cannot be easily predicted

Part 2: Frequency of Residual Disbursement – Quantitative Comparison

Post-rebate Price Under Relative Zonal Price Methodology

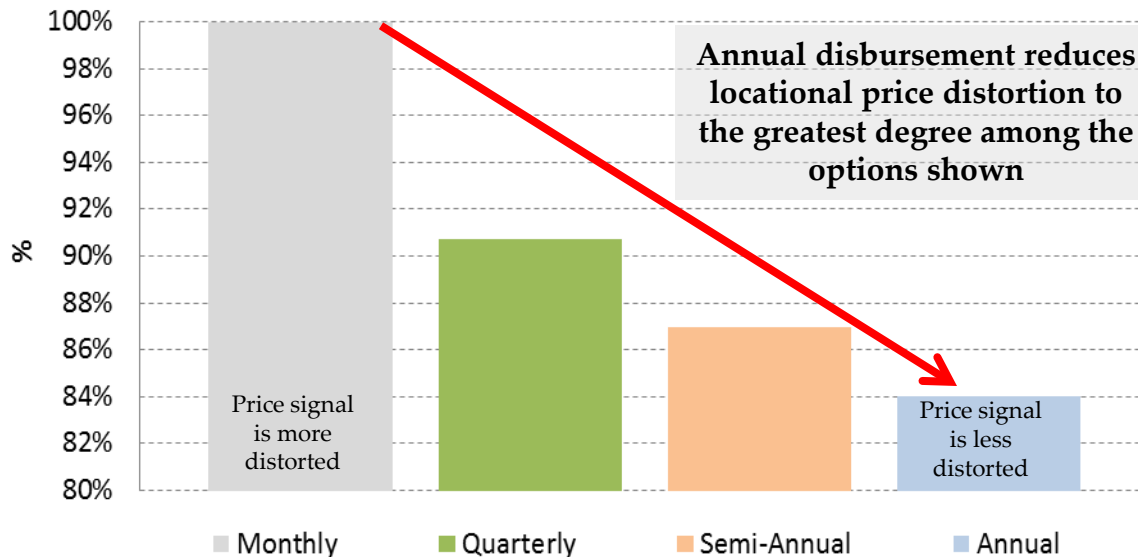


Status quo: HOEP + CMSC + losses

- Under all four frequencies the post-rebate prices are lower for all zones compared to the status quo
- As the disbursement becomes less frequent little change occurs in most zones
- However, the frequency of disbursement can limit how much the short-run price signal is altered

Part 2: Frequency of Residual Disbursement – Quantitative Comparison

**Difference as a Percentage of Monthly Disbursement
Across All Zones, 2014-2017**



- Post-rebate 4-year average prices are 9% closer to pre-rebate 4-year average prices under quarterly vs. monthly disbursement

- The pre-rebate price reflects the cost of producing power to meet zonal consumption
- The smallest total absolute difference between pre-rebate and post-rebate prices represents the least overall locational price distortion, on average
- The difference between post-rebate price and pre-rebate price levels is the lowest with the least frequency (i.e., Annual)
- The narrower the difference between pre and post rebate prices, the less impact the disbursement allocation has on the efficiency of the short-run price signals

Part 2: Frequency of Residual Disbursement – Qualitative Evaluation

Market Renewal Principles	Frequency of Residual Disbursement				
	Interval*	Monthly	Quarterly	Semi-annual	Annual
Efficiency (Short-run*)	X	●	■	■	■
Competition	●	●	●	●	●
Implementability	●	■	■	●	●
Certainty	■	■	■	■	■
Transparency	■	■	■	■	■

■ - Satisfies; ● - Neutral/Somewhat satisfies; X – Does not satisfy

* "Interval" is added here only for the purpose of comparison

Results of Frequency of Disbursement

Quantitative and Qualitative Analysis

- The IESO's proposal is to calculate and disburse the residuals on a quarterly basis. This will reduce adverse locational price impacts relative to those under Monthly disbursement
 - As data shows, the Quarterly calculation and disbursement results in prices that are closer to the pre-residual price than with a monthly calculation
 - It is expected that because it will become harder for consumers to predict what amount of residuals they will be allocated Quarterly, the impact of the residual on their RT consumption decision will decrease
 - Quarterly calculation and disbursement provides for an improvement over Monthly disbursement, while allowing to return residuals sooner to market participants than under Semi-annual or Annual frequencies

Summary: Revised Decision

- The IESO proposes that residuals will be calculated and disbursed using the Relative Zonal Price methodology where residuals are returned to zones with prices that are higher than the supplier weighted Ontario average *on a quarterly basis*

Next Steps

- Participants are invited to consider the revised decision and provide comments by October 18, 2018

Appendix

Market Renewal Principles

- The IESO and stakeholders worked closely together to establish Market Renewal Principles:
 - **Efficiency** - lower out-of-market payments and focus on delivering efficient outcomes to reduce system costs
 - **Competition** - provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs
 - **Implementability** - work together with our stakeholders to evolve the market in a feasible and practical manner
 - **Certainty** - establish stable, enduring market-based mechanisms that send clear, efficient price signals
 - **Transparency** - accurate, timely and relevant information is available and accessible to market participants to enable their effective participation in the market

Thank you