MRP Energy Detailed Design

Design Document: Real-Time Calculation Engine

Stakeholder Feedback Form

Date Submitted:	October 30, 2020
Feedback Due:	October 30, 2020
Feedback Provided by:	
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The IESO is posting a series of detailed design documents which together comprise the detailed design of the MRP energy stream.

This design document is posted to the IESO engagement webpage under Market Renewal - Energy Stream Designs - Detailed Design.

Stakeholder feedback for this design document is due on October 30, 2020 to engagement@ieso.ca .

Please let us know if you have any questions. IESO Engagement.

General Feedback on the Detailed Design Document

(please expand any section as required)

Introduction

Ontario's local distribution companies (LDCs) are the face of the industry to the overwhelming majority of the end users in the province: they serve over 5,000,000 customers and in 2019 delivered approximately 125 TWh – or about 90% - of all the electricity used in the province.

These are the comments of the Electricity Distributors Association (EDA) on the Independent Electricity System Operator's (IESO) Detailed Design for Energy – Market Renewal Program (MRP). Our focus is on matters directly relevant to LDCs, that the IESO will assign non-dispatchable load (NDL) status when MRP is deployed, and LDC-connected customers. Our objectives are:

- to identify improvements to the Detailed Design, and
- to provide constructive comments that will support the transition from Detailed Design to Implementation.

Our comments build on those made during the High-Level Design phase. This submission is consistent with the EDA's feedback on other draft

Detailed Design documents published by the IESO, including the Day Ahead Market (DAM) Calculation Engine.

We support the objectives of the MRP - being to improve economic efficiency, transparency, and competitiveness of Ontario's wholesale electricity market – and we understand that they are expected to lower electricity costs for consumers. However, we question if the IESO has publicly provided clear analysis of how the proposed use of Locational Marginal Prices (LMPs) will impact stakeholders.

The EDA anticipates the new scheduling, commitment and dispatch processes that are based on LMPs will contribute to lowering wholesale electricity costs. The EDA also points out that charging load customers at prices that are based on LMPs will raise inequities: some load customers may perceive that they enjoy a benefit and others that they are disadvantaged for reasons beyond their control and because of decisions taken by other parties in past periods.

The EDA acknowledges that the IESO's current pricing methodology results in cross-subsidies and that pricing supply to consumers using LMPs may overcome them. We seek a clear stakeholder analysis from the IESO of the proposed use of LMPs, with special attention to how LMP based commodity prices will impact end users. To be clear, stakeholders will need to be analyzed at the class level, locationally, according to whether they have control over the infrastructure that serves them with commodity supply and other factors.

Recent EDA submission

Below is the EDA's high level synopsis of its previous submissions that are relevant to this submission.

We repeat that, in addition to identifying the required amendments to IESO Market Rules and Market Manuals, the IESO, the Ontario Energy Board (OEB), and the Ministry of Energy, Northern Development and Mines (MENDM) should proactively engage with LDCs and their customers to identify, scope, evaluate and decide on enabling legislative amendments, amendments to regulatory policy and amendments to regulatory instruments.

For example, the IESO's published materials to date have not provided instruction as to which wholesale market price produced in the renewed market will be applied to non-RPP customers and it remains unclear how LDCs will be invoiced under MRP and, by extension, how their customers' bills will change.

We continue to assume that the OEB will amend the formulas it uses to calculate Regulated Price Plan (RPP) prices to use the appropriate new wholesale market prices (e.g., the DAM Ontario Zonal Price).

We also assume that the OEB will amend the formulas used in the Retail Settlement Code, e.g., to replace references to the Hourly Ontario Energy Price (HOEP) with the appropriate new wholesale market price clarifications.

These changes to OEB codes will clarify how the electricity commodity charges for non-RPP customers, whose electricity commodity charges currently consist of the HOEP and Global Adjustment charges, are to be quantified in the reformed market.

LDCs will be responsible for implementing revised, or possibly new, settlement and billing processes and will be the main point of contact for electricity customers with respect to changes on electricity bills.

We also repeat our proposal that each Detailed Design produced by the IESO consistently apply terminology and defined terms. For example, within the Real-Time (RT) Calculation Detailed Design, the IESO uses the following terms interchangeably:

- "real-time hourly Ontario zonal price"
- "RT Ontario Zonal Price"
- "zonal prices"

As the EDA commented in its feedback on the Market Settlements Detailed Design on July 31, 2020, the IESO should use standardized terms correctly and consistently so that confusion is avoided, the usability of the documents is improved and gap analysis is facilitated.

Themes and Motivation of this submission

Consistent with our submission on the DAM Calculation Engine, the themes of this submission are:

- Whether the Detailed Design is substantially complete (i.e., exclusion of electricity storage resources),
- The requirement for additional detail and worked examples to enhance users' and readers' comprehension of this Detailed Design document,
- The need to link the Real-Time (RT) Calculation Engine's outputs to market settlement, and
- The need to consistently use terminology in each Detailed Design document and among all Detailed Design documents.

The inputs required for the IESO to settle with NDL entities in the reformed market will be produced by the DAM Calculation Engine and by the RT Calculation Engine. These comments focus on how the RT Calculation Engine Detailed Design identifies, calculates, produces, and reports the inputs required for settlement with NDLs. The EDA's review of the RT Calculation Engine focuses on the following inputs for settlement:

Input for Settlement	Derivation of Input	Reference
DAM_LMP$_z$	Output of DAM Calculation Engine	Please see the EDA's submission to the draft DAM Calculation Engine Detailed design (September 24, 2020)
RT_LMP (NDL)	Output of RT Calculation Engine	Section 3.8
RT_LMP (non-PRL HDR)	Output of RT Calculation Engine	Section 3.8
DAM_QSW (NDL)	Output of DAM Calculation Engine	Please see the EDA's submission to the draft DAM Calculation Engine Detailed design (September 24, 2020)
DAM_QSW (non-PRL HDR)	Output of DAM Calculation Engine	Please see the EDA's submission to the draft DAM Calculation Engine Detailed design (September 24,

Input for Settlement	Derivation of Input	Reference
		2020)
AQEW	Quantity measured in real-time	None required.

The “Inputs Used for Settlements” are detailed below and are referenced in our more detailed comments.

Per the Market Settlement Detailed Design, NDLs will be settled at the Hourly Physical Transaction Settlement Amount for NDLs (HPTSA_NDLs) which is calculated as follows:

The LFDC is calculated as the sum of the “Real-Time Purchase Cost/Benefit” and “DAM Volumetric Cost/Benefit”.

$$HPTSA\_NDL_{k,h} = (DAM\_LMP_h^z + LFDC_h)\, x \sum^{T} AQEW_{k,h}^{m,t}$$

Where

- ‘T’ is the set of all metering intervals 't' in settlement hour 'h'

The inputs required for settlement are:

- DAM_LMPz = DAM Ontario Zonal Price
- LFDC = Load Forecast Deviation Charge (LFDC)
- AQEW = allocated quantity of electricity withdrawn by the NDL

The LFDC is calculated as the sum of the “Real-Time Purchase Cost/Benefit” and “DAM Volumetric Cost/Benefit”.

$$\begin{aligned} Real-Time\ Purchase\ Cost\_Benefit \\ = \sum_{K,h}^{M,T} \left[RT\_LMP_h^{m,t}\ x\ (AQEW_{k,h}^{m,t} - DAM\_QSW_{k,h}^{m}/12)\right] \\ - \sum_{K,h}^{M2,T} \left[RT\_LMP_h^{m,t}\ x\ DAM\_QSW_{k,h}^{m}/12\right] \end{aligned}$$

Where

- ‘M’ is the set of all delivery points ‘m’
- ‘M2” is the set of all delivery points ‘m’ relating to hourly demand response resources that are not registered as price responsive load[3]
- ‘T’ is the set of all metering intervals ‘t’ in settlement hour ‘h’
- ‘K’ is the set of all market participants ‘k’ with NDL facilities

Additional variables required for settlement are:

- RT_LMP = both NDLs and non-price responsive load (N-PRL) hourly demand response (HDR) resources RT locational marginal price (LMP) is quantified at the delivery point.
- DAM_QSW = for NDLs, the DAM quantity scheduled for withdrawal at NDL delivery point; and for N-PRL HDRs, the DAM quantity scheduled for withdrawal at the delivery point.

Similar to our commentary on the draft DAM Calculation Engine, the EDA finds that the IESO RT Calculation Engine would be improved by adding a clear summary of the inputs required for NDL settlement and clear instruction for the calculation and reporting of these inputs.

Design Document Section

1. Introduction

No comment.

2. Summary of Current and Future State

We consider that this section provides a suitable overview of the proposed RT Calculation Engine. We suggest that a mapping of the outputs of the RT Calculation Engine to the

IESO's market settlement processes and to market participants settlement processes will improve the Summary.

We suggest that the IESO ensure consistency of terminology in this section relative to other Detailed Design documents. For example, the IESO uses the term "load forecast adjustment of the DAM hourly zonal price" as opposed to the defined term per the Market Settlement Detailed Design which is "Load Forecast Deviation Charge (LFDC)". We note this recommendation is also applicable to section 3.6.2 as well.

3. Detailed Functional Design

We consider that this section provides a detailed description of the proposed RT Market's functions, calculations, and outputs. Consistent with our feedback on the DAM Calculation Engine, we agree with other stakeholders who commented at the IESO's August 27, 2020 webinar that the inclusion of worked examples will improve all parties' understanding of the Detailed Design.

We characterize the Detailed Design as incomplete as it does not reference changes proposed by the interim design of the IESO's Storage Design Project. For example, the

IESO does not include references to 'electricity storage participants' per MR-00445-R00- R05 ('Implementation of the Interim Storage Design'), which is currently being reviewed by the IESO's Technical Panel in preparation for consideration by the IESO's Board of Directors, the final step in the Market Rule amendment process.

We offer the following specific feedback:

Section 3.2 Objectives

The IESO notes that nodal and zonal prices will provide more accurate pricing signals and improve incentives for market participants to submit offers at marginal costs. We seek confirmation that the IESO considered the unique characteristics of the Ontario electricity sector (e.g., contracted resources, rate-regulated resources, Global Adjustment cost allocation) in this Detailed Design. As demonstrated elsewhere in this submission (refer to Section 3.8 below),

reforms to the wholesale market must consider the interplay of out-of-market payments to generators and the implications for consumers who respond to price signals that recover such out-of-market costs.

Section 3.6.3 Outputs for Energy and OR Settlement

We request that the IESO clarify whether proxy buses will be used as price setting locations (i.e., included as an internal price setting node). This concern arises when Table 3-9, that defines the variable “FHDR” as the fixed schedule of energy consumption for the interval for physical or virtual hourly demand response (HDR) resources at a bus, is read in conjunction with section 3.4.1.3, that states that virtual HDR schedules will be defined by a ‘proxy bus’.

Section 3.7.1.2 Security Limits (re: NDL quantities)

We observe that this section lacks specificity. We recommend that the IESO provide more detail as well as worked examples (e.g., on the quantification of NDL quantities).

This section describes that the IESO will use load distribution factors (LDFs) to allocate the IESO demand forecast among each of the four demand forecast areas. The IESO then backs out the forecast NDL demand levels to determine the MWs required by the PRL in the forecast area.

We understand that the resulting price data are key inputs for price formation. The IESO proposes to further adjust the demand data by pro rating LDF data to reflect IESO control decisions. We seek worked examples prepared by the IESO to assure itself that it has understood the process correctly and to understand how the data that will be essential to price formation is derived.

Section 3.8 Pricing Formulas (re: settlement price floor)

The IESO proposes to continue to rely on the current minimum price for bids and offers from active market participants of -$2000/MWh and to modify any LMPs that are between this level and -$100/MWh to -$100/MWh.

A lower settlement price floor will result in lower LMPs which, all other things being equal, will increase the Global Adjustment (GA). While Class A customers will be able to control their GA responsibility, Class B customers cannot. Class B customers risk a combined lower commodity price and a higher Global Adjustment. We seek to confirm its expectation and propose that the IESO provide:

- its analysis of the impacts to Class A and Class B customers of the proposed design decision on settlement price floors
- a description of how the IESO used this analysis when adopting the design decision and subsequently when the IESO the quantified threshold values.

We seek additional information on the IESO's design decision for the -$100/MWh settlement price floor including:

- how often does IESO anticipate the need to adjust or modify prices?
- which locations in the province are anticipated to be impacted by the modification of prices to the settlement floor?
- whether the settlement price floor creates advantages or disadvantages for certain resources
- whether the IESO will publish modified as well as un-modified prices?

We look forward to better understanding the impact of adjusted prices to consumers, whether Class A of Class B.

Section 3.8 Price Formulas (re: weighting factors)

The IESO states that it will use weighting factors derived by renormalizing LDFs to calculate prices in NDL zones and that the sum of the weighting factor for an individual zone will be set to one. We seek improved clarity (e.g., worked examples) of the derivation of renormalized LDFs and of how renormalized LDFs are used in subsequent calculations, including the derivation of the RT LMPs.

Section 3.8.1.3 Zonal Energy Prices

We seek to clarify that the RT Ontario Zonal Price will not be used for NDL settlement purposes. The IESO should clarify the use of the RT Ontario Zonal Price by mapping to the IESO Market Settlement Detailed Design or other IESO processes.

4. Market Rule Requirements

No comment

5. Procedural Requirements

No comment

6. Business Process and Information Flow Overview

No comment