

SSM Design Elements - Preliminary Decisions

November 13, 2017

IESO Analysis and Stakeholder Feedback

- When reviewing stakeholder feedback on the SSM project it was evident that there was significant alignment between the IESO, FTI and stakeholders regarding several design elements
- Given that alignment, the IESO is proposing to move forward with preliminary decisions on 12 design elements of SSM
 - Some decisions are features of a SSM

Moving Forward - Second Level Design Issues

- In some cases, making preliminary decisions will allow for the IESO and stakeholders to focus on second level design issues
 - e.g. Mitigation Process
 - Conduct and Impact test ✓
 - » Conduct and impact thresholds ?
- The IESO will speak to potential second level design issues during today's discussion

Preliminary Decisions – 12 Design Elements

Design Elements	
1	Energy Price - Congestion Component ✓
2	Energy Reference Price ✓
3	Energy Price – Loss Component ✓
4	Ex Post vs. Ex Ante Pricing ✓
6	Supplier Pricing ✓
7	Operating Reserve Reference Price ✓
8	Operating Reserve Price - Congestion Component ✓
11	Multiple Interval Optimization ✓
13	Mitigation Process ✓
14	Timing of Application ✓
15	Reference Levels ✓
18	Make Whole Payments ✓

Design Element #1

ENERGY PRICE – CONGESTION COMPONENT

Preliminary Decision – Congestion Component



There is only one viable option for this design element:

- 1. Include the cost of congestion in energy prices**

Rationale For Preliminary Decision

- Including the cost of congestion in prices is a foundational feature of a single schedule market
- Congestion cost should be reflected in energy market prices to provide efficient incentives for the flexible participation of a diverse mix of resources at a variety of locations across the province

Design Element #2

ENERGY PRICE – REFERENCE LOCATION

Preliminary Decision – Reference Location



There are two options for defining the energy reference price location:

- 1. Continue to use Richview as the reference location**
2. Use some other reference location

Rationale For Preliminary Decision

- Richview is close to the load centre and has a strong connection with the rest of the system
- Since market open, Richview has been used as the reference location without any adverse impacts on dispatch solutions

Design Element #3

ENERGY PRICE – LOSS COMPONENT

Preliminary Decision – Loss Component



There are three broad approaches Ontario could use to take account of the cost of marginal losses:

- 1) Include the cost of marginal losses in the dispatch but exclude this cost from prices
- 2) Exclude the cost of marginal losses from prices and from the dispatch
- 3) Include the cost of marginal losses in both the dispatch and prices**

Rationale For Preliminary Decision

- Including losses in the dispatch of generation minimizes the cost of meeting load
- Including the cost of losses in market prices would eliminate the need for make whole payments (like CMSC) due to losses pricing and is consistent with the goal of the Single Schedule Market

Design Element #4

EX-ANTE VS EX-POSTE PRICING

Preliminary Decision – Ex Ante vs. Ex-Poste Pricing



Two options for when/how to determine prices:

- 1. Ex-Ante pricing: Use the same inputs that were used to determine schedule / dispatch**
2. Ex-Post pricing: Use after-the-interval information based on actual results

Rationale For Preliminary Decision

- Aligns with principal that price should reflect dispatch
- Virtually all US ISOs have adopted Ex-Ante pricing
- Ex-Ante pricing avoids problems identified by MISO and ISO-NE with inconsistencies between Ex-Post pricing and dispatch requiring increased make-whole payments

Design Element #6

SUPPLIER PRICING

Preliminary Decision – Energy Pricing for Suppliers



There are two options for paying suppliers for energy:

- 1. Nodal Pricing**
2. Zonal Pricing

Rationale For Preliminary Decision

- Analysis showed significant nodal price dispersion in the NW, NE
- Mixed nodal-zonal approach not recommended due to added complexity
- All US ISOs pay generation nodal price for energy
- Nodal pricing allows for greatest efficiency gains through stronger alignment between price and dispatch
 - will better support operability by providing spot market incentives to provide the required flexibility

Design Element #7

OPERATING RESERVE REFERENCE PRICE

Preliminary Decision – Operating Reserve Reference Price



There is only one option for Operating Reserve Reference Price:

- 1. Continue to jointly optimize Energy and Operating Reserves**

Rationale For Preliminary Decision

- Co-optimizing OR with energy is a recognized industry-wide best practice
- The IESO already co-optimizes OR and energy in both constrained and unconstrained schedules
- No need to change this current practice

Design Element #8

OPERATING RESERVE PRICE - CONGESTION COMPONENT

Preliminary Decision – Operating Reserve Price – Congestion



There is only one option for Operating Reserve Price – Congestion Component:

- 1. Include the cost of congestion in Operating Reserve prices**

Rationale For Preliminary Decision

- Locational reserve constraints must be included in the constrained schedule because they represent reliability obligations
- Including reserve congestion in reserve pricing will better align reserve pricing and dispatch
- This will provide a more efficient price signal for supply and demand resources to provide reserves in higher priced regions & will avoid additional reserve make-whole payments

Design Element #11

MULTIPLE INTERVAL OPTIMIZATION

Preliminary Decision – Multiple Interval Optimization



There are two options for multi interval optimization:

1. Use multiple interval optimization to determine schedules but not prices
- 2. Use multiple interval optimization to determine schedules and prices**

Rationale For Preliminary Decision

- Improves price signal alignment with prevailing system conditions/needs and those in subsequent intervals
- Reduces frequency of required make-whole payments by ensuring that methodology for dispatch and pricing are aligned
- Consistent with NYISO and CAISO, the only other jurisdictions which use multi-interval optimization in dispatch and pricing

Design Element #13

MITIGATION PROCESS

Preliminary Decision – Mitigation Process



There are two viable options for the design of a market power mitigation framework:

1. A pivotal supplier test
- 2. A conduct and impact test**

Rationale For Preliminary Decision

- No need for complex set of assumptions, e.g. regarding offers of competing suppliers
- Does not depend on catching all binding transmission constraints prior to real-time
- Mitigation is more directly tied to (estimates of) the actual exercise of market power
 - Two-part test requires:
 1. Participants to first fail a conduct test
 2. A direct price impact stemming from the conduct test violation before mitigation is applied

Design Element #14

TIMING OF APPLICATION

Timing of Application

There is only one viable option for the timing of the application of market power mitigation:

1. Apply market power mitigation ex-ante

Rationale For Preliminary Decision

- In single schedule markets the exercise of local market power can materially impact clearing prices for all buyers and sellers within a constrained region
- After-the-fact mitigation of offer prices in single schedule markets would entail resettling the entire market, which would be costly and disruptive
- Ex-ante mitigation is the only viable option

Design Element #15

REFERENCE LEVELS

Options: Reference Levels



There are two viable options:

- 1. Apply the principles used today to determine reference levels for market power mitigation in an SSM market**
2. Develop new principles to apply when determining some or all reference levels in an SSM market

Rationale For Preliminary Decision

- The principles that govern how the current regime determines reference levels and settlement adjustments are consistent with those underpinning reference levels under ex-ante mitigation regimes
- Moving to ex ante mitigation does not render the general approach adopted today unviable
- However, ex-ante mitigation will require a change in methodology for determining reference levels

Design Element #18

MAKE WHOLE PAYMENTS

Preliminary Decision – Make Whole Payments



There are two options for make whole payments:

- 1. Include make whole payments in the design for constrained up and constrained down suppliers**
2. Include make whole payments for only constrained up suppliers

Rationale For Preliminary Decision

- Creates appropriate incentives for resources to follow IESO dispatch instructions
 - Better operational certainty for the IESO
- In general, make whole payments will no longer occur because of transmission congestion
 - Constrained down payments offset by OR revenues
- Consistent with most other jurisdictions (with the exception of PJM)