

SINGLE SCHEDULE MARKET PRICING ISSUES

**Presented by
Scott Harvey and Susan Pope**

**Phase 1 - Session 3
Module H: Make Whole Payments and Uplift**

July 27, 2017
Toronto, Ontario



MODULE H: MAKE WHOLE PAYMENTS AND UPLIFT

INTRODUCTION

Module H addresses the settlement impact of moving to locational prices as the basis for energy and operating reserve settlements.

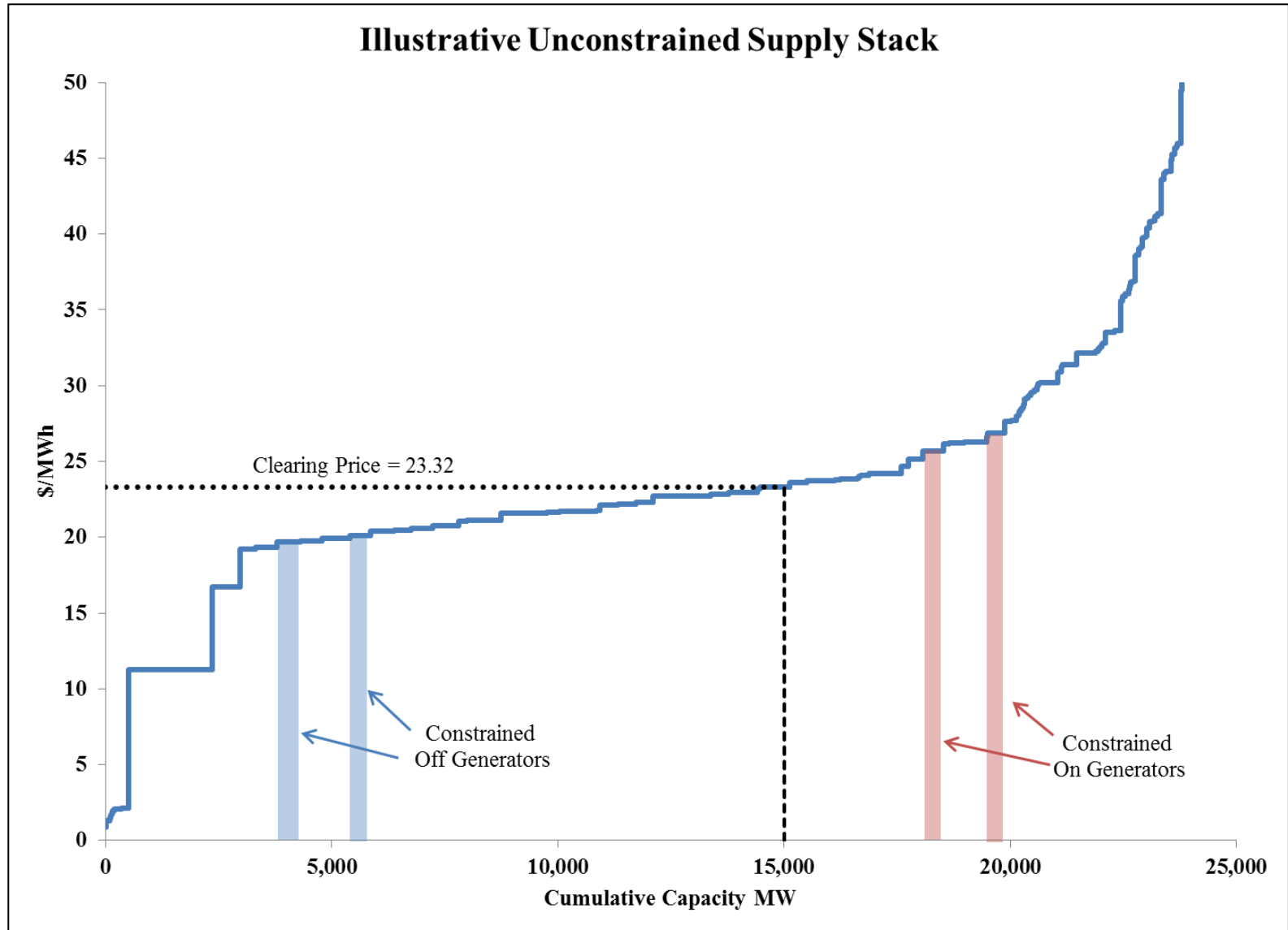
- General settlement will be addressed in other streams of the Market Renewal
- General settlement will likely involve changing existing charge types as a result of new locational price references

MAKE WHOLE PAYMENTS

Under the SSM design, in some circumstances make whole payments will be needed to compensate market participants for differences between the settlement price they are paid and their offer costs for their scheduled output quantity.

- This discussion excludes cost guarantees arising from unit commitments, such as the currently used production cost guarantee (PCG), generation cost guarantee (GCG) and inertia offer guarantee (IOG). These will be addressed in other work streams of the Market Renewal
- Make whole payments could arise for either energy or reserve schedules

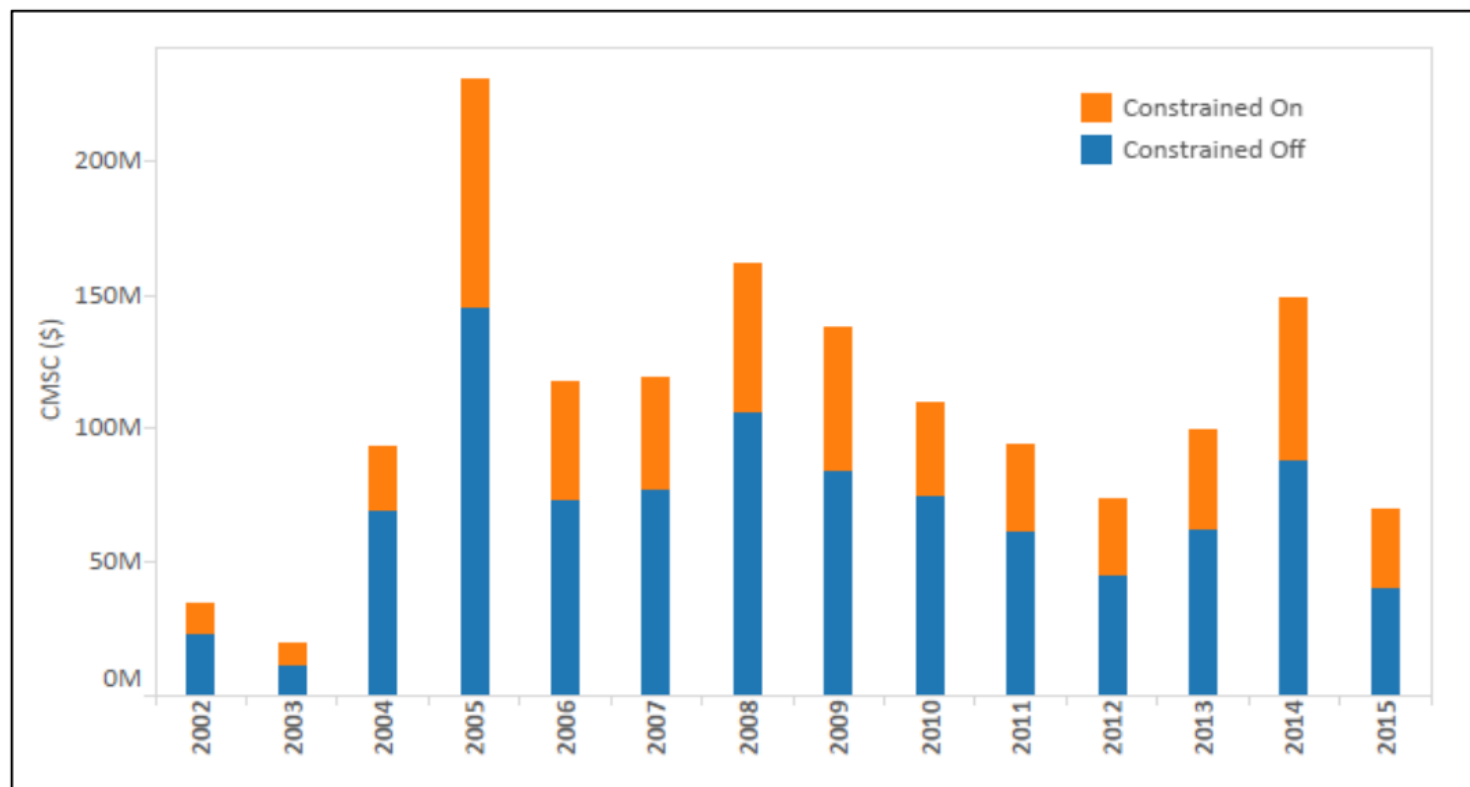
Because the MCP and HOEP are typically not consistent with the offer prices and dispatch of generation resources, congestion management settlement credit (CMSC) payments are needed to ensure that if generators offer their supply at cost, their profits will not be reduced by following dispatch instructions.



HOEP/MCP UNCONSTRAINED PRICES

CMSC

In Ontario, the CMSC has averaged \$110 million per year, but varies substantially between years.



Source: https://www.oeg.ca/oeg/_Documents/MSP/MSP_CMSC_Report_201612.pdf

Under a basic LMP pricing design:

- The LMP price at each location generally will be greater than or equal to the offer price of all generation segments that have been fully dispatched at that location. Every generator should be willing to operate at the level to which it is dispatched because the LMP price will be greater than or equal to its offer price for that output
- The LMP price at each location generally will be less than the offer price of generation segments at that location that have not been dispatched. Generators that have not been dispatched should not want to generate a higher output because the LMP price at their location will be less than their offer price for a higher output
- Analogous consistency principles pertain to dispatchable loads

Under the SSM design, make whole payments will no longer occur because of inconsistencies between suppliers' settlement prices and the dispatch due to transmission congestion (under ordinary operating conditions).

- Higher LMPs in constrained up areas should be sufficient to cover the offer cost of incremental generation
- The LMPs in constrained down areas should not be higher than the offer prices of generation that is dispatched down

However, make whole payments may continue to arise under SSM due to the pricing consideration of:

- Operating restrictions, particularly minimum loads
- Operator actions to maintain reliability: operating reserve activations; manual dispatches; or manual control actions
- Multi-interval optimization of resources in advance of future intervals
- Administration of the market following market suspension or tool issues
- These make whole payments will depend on the price formation rules for the LMPs during these situations (discussed in Modules D and E)

In other SSM markets, certain eligibility criteria need to be satisfied in order for a market participant to collect a make whole payment.

Common ineligibility criteria include:

- Self-scheduling in intervals before (or after) interval in which make whole payment potentially occurs
- Deviation from ISO dispatch instructions
- Changes in minimum load offer prices or non-price bid parameters after the resource is committed
- Participant request for specific dispatch to prevent endangering the safety of any person, equipment damage, or violation of any applicable law

UPLIFT

As under the current system, SSM costs and revenues falling into the uplift category are those for which no other payment or charge has been designed.

- These costs and credits will likely be billed or distributed to consumers and/or exporters
- Examples of possible uplift components include:
 - Make whole payments
 - Penalties or failure charges
 - Under-collection (e.g., due to default)
 - Congestion rents
 - Marginal losses residual
 - Cost guarantees
 - Ancillary service cost recovery (e.g., operating reserve costs)

The factors determining many of these uplift payments and credits will be discussed in other streams of the Market Renewal.

- The distribution of these payments and credits to loads and exports (after subtracting any amounts distributed based on other billing determinants) will be discussed within these other streams
- Calculations of some of the uplift payments and credits might depend on the combination of the market rules from several work streams. For example, cost guarantee calculations could depend on both day-ahead and real-time settlements

The congestion rent and marginal loss residuals previously discussed would be new components of uplift under SSM.

- Current uplift charges for CMSC and losses would no longer exist
- Charges for marginal losses and congestion are included in LMP settlement prices
 - The congestion residual is the difference between the settlements for marginal congestion costs and the actual cost of congestion
 - The loss residual is the difference between the settlements for marginal losses and the actual cost of losses

- Residuals occur in both the new day-ahead market (hourly) and in the real-time market (interval)
- Congestion rent residual is generally a positive value, which would be an uplift disbursement, but can be negative in some hours or intervals
- The marginal loss residual is generally a positive value, so would be an uplift disbursement

The amount of the congestion rent residual collected under SSM settlements will depend on the cost of congestion on the transmission system operated by the IESO.

- Under other SSM systems the congestion rent residual is generally paid (or charged, if negative) to the parties ultimately paying for the transmission cost of service, i.e., loads
- This settlement generally occurs through a combination of:
 - Financial transmission rights (FTRs), which are a building block for systems of congestion hedges
 - Auction revenue rights (ARRs), which can be used to support liquid FTR auctions
 - Allocation of remaining congestion rent residual (which may be positive or negative) through an uplift

ISOs use a variety of designs to allocate the marginal loss residual:

- The NYISO allocates the loss residual to real-time load (including exports) on a per megawatt hour basis, effectively as a revenue offset to uplift charges
- The MISO allocates the loss residual to geographic regions within the MISO using a fairly complex calculation of where losses were incurred and then allocates this residual to real-time load within the region
- The CAISO allocates the loss residual to real-time load
- PJM was initially required to allocate the day-ahead loss residual to day-ahead market transactions, which led to the submission of virtual schedules intended to benefit from this allocation

Total PJM Costs by Component (\$ Millions)						
Year	PJM Billing	Congestion	Congestion (%)	Losses	Losses (%)	Loss Residual
2009	\$26,550	\$719	2.7%	\$1,268	4.8%	\$640
2010	\$34,771	\$1,423	4.1%	\$1,635	4.7%	\$836
2011	\$35,887	\$999	2.8%	\$1,380	3.8%	\$587
2012	\$29,181	\$529	1.8%	\$982	3.4%	\$387
2013	\$33,862	\$677	2.0%	\$1,035	3.1%	\$345
2014	\$50,030	\$1,932	3.9%	\$1,466	2.9%	\$482
2015	\$42,630	\$1,385	3.2%	\$969	2.3%	\$336
2016	\$39,050	\$1,024	2.6%	\$697	1.8%	\$227

Source: Monitoring Analytics, LLC. "2016 State of the Market Report for PJM," Table 11-7, March 9, 2017

Note: Ontario load was 17.6% of PJM load in 2016.