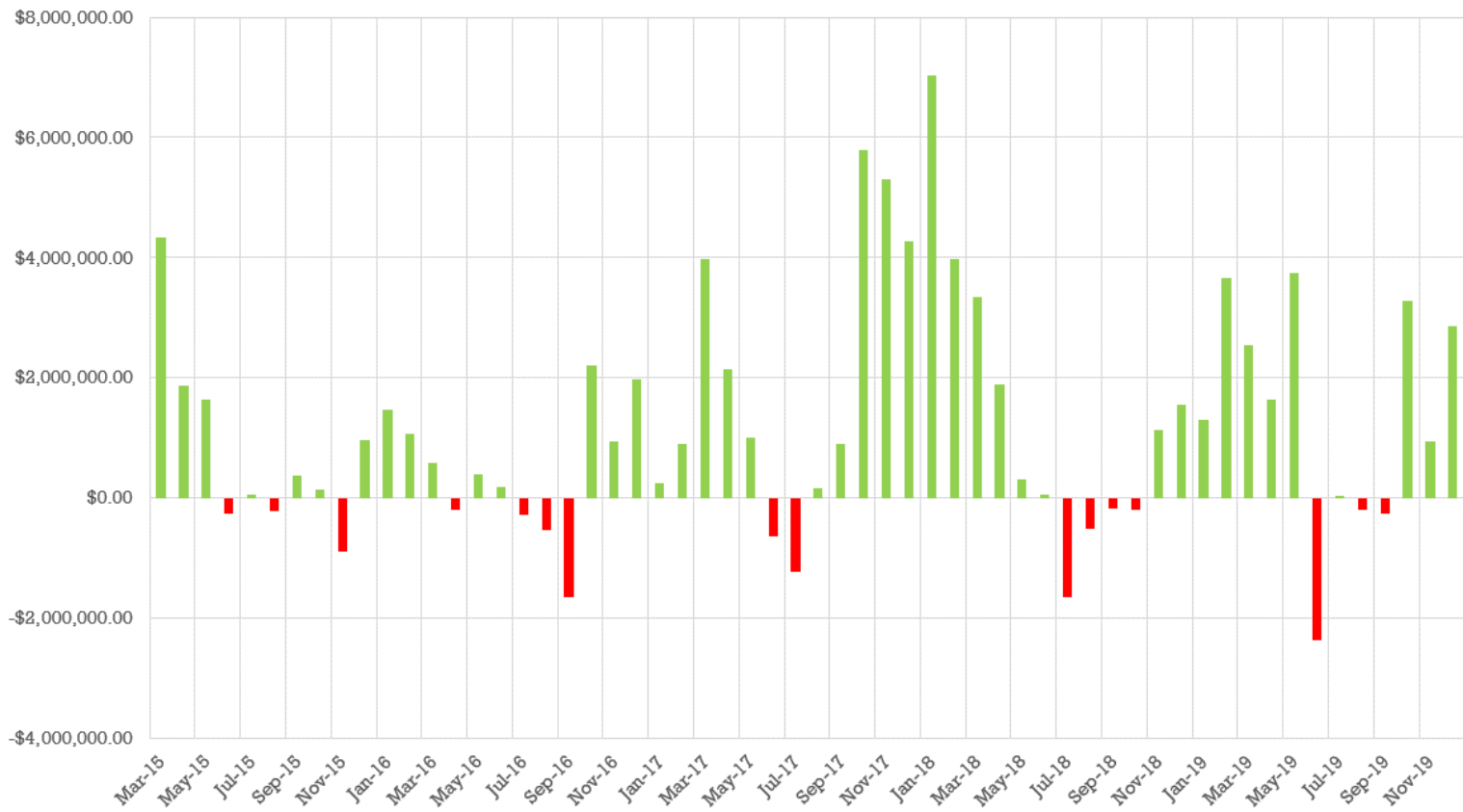




MWG Market Initiative
Market-to-Market Impact
3/18/2020

M2M HISTORY SUMMARY SINCE GO-LIVE: MISO PAYS SPP **\$70,959,752.10**

M2M Settlements since Go-Live



Note: Positive values are payments to SPP from MISO; negative values are payments from SPP to MISO.

Source: 08 December 2019 M2M FG Summary.pptx presented at the Feb_20 Seams Steering Committee

TOP 10 FLOWGATES SINCE M2M GO-LIVE

Position	FG	Description	Control Zone	GRAND_TOTAL	DIRECTION
1	SWPP_5375	Neosho - Riverton 161kV <u>ftlo</u> Neosho - Blackberry 345kV	EDE, WR	\$30,771,661.25	MISO Pays SPP
2	SWPP_5577	Nashua 345/161 kV Transformer <u>ftlo</u> Nashua - Hawthorn 345kV	KCPL	\$7,223,403.30	MISO Pays SPP
3	SWPP_5501	CBLUFFS - SUB3456 345 kV <u>ftlo</u> ROLLHILLS - MADNCO 345 kV	MEC, OPPD	\$4,137,638.20	MISO Pays SPP
4	SWPP_6126	S1226-Tekamah 161kV flo S3451-Raun 345kV	OPPD, MEC	\$3,546,902.49	MISO Pays SPP
5	SWPP_5665	Raun - Tekamah 161kV ftlo Raun - S3451 345kV	OPPD, MEC	\$2,806,250.24	MISO Pays SPP
6	MISO_1967	Arkansas_PleasantHills500kv_ftlo_Arkansas_Mabelvale500kv	EAI	\$2,560,809.13	MISO Pays SPP
7	SWPP_23829	Kelly - King Hill 115 kV ftlo Cooper - St Joe 345 kV	WR	\$2,279,193.52	MISO Pays SPP
8	SWPP_23879	Lewis and Clark - Richland 115 kV FTLO of Belfeld - Charlie Creek 345 kV	WAUE	\$2,165,496.90	SPP Pays MISO
9	SWPP_24399	Oahe - Sully Butte 230 kV FTLO LN Ft. Thompson - Leland Olds 345 kV	WAUE	\$2,038,910.12	MISO Pays SPP
10	SWPP_23199	CBEC - Sub 1206 ftlo Council Bluffs - Sub 3456 345kV	OPPD, MEC	\$2,016,989.58	MISO Pays SPP

NEORIVNEOBLC accounts for 43% of the Total M2M Net Payment

Top 10 Flowgates amounts to \$59,547,254.73
(= 84% of Total M2M Net Payment)



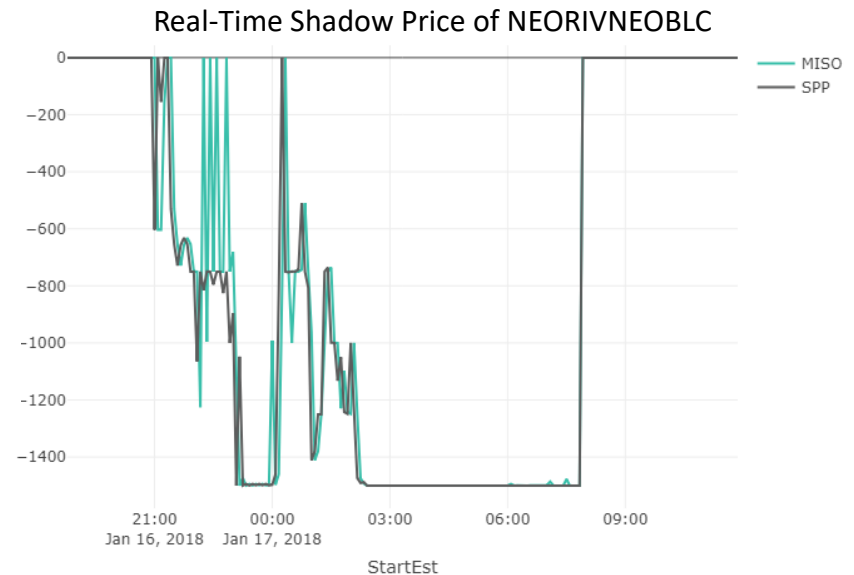
Source: 08 December 2019 M2M FG Summary.pptx presented at the Feb_20 Seams Steering Committee

Market-to-Market

- Objective: convergence across RTOs on how the congestion on M2M constraints are priced

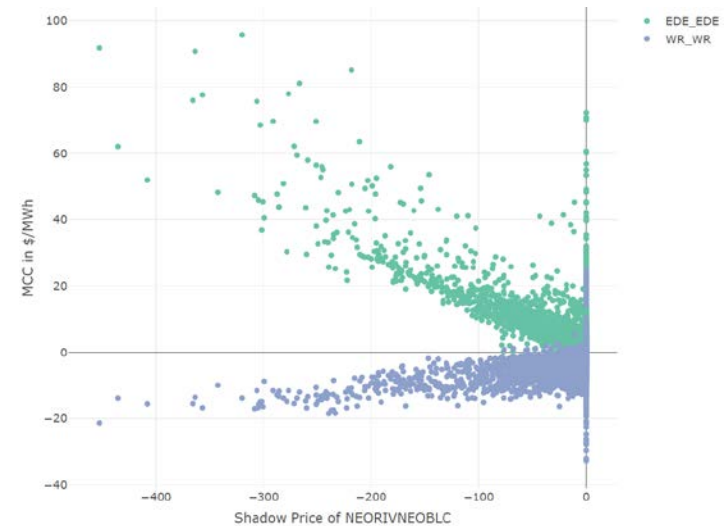
HOW DOES IT WORK

1. Real-time flowgate that is M2M goes into congestion and MRTTO activates.
2. The NMRTTO is assigned a relief target.
3. During the entire event the cost to generate (shadow price), relief request, and whether the flowgate is still in congestion will constantly be exchanged automatically between the two entities.
4. Once the congestion is no longer a concern for that flowgate the event is ended.



Market-to-Market

- Market-to-Market is not a Revenue
 - MISO pays SPP because SPP dispatch costs would have been cheaper had MISO reduced their flows
- M2M affects congestion pricing on nodes differently
 - NEORIVNEOBLC
 - Increases
EDE_EDE congestion pricing
 - Decreases
WR_WR congestion pricing



Real-Time or Day-Ahead

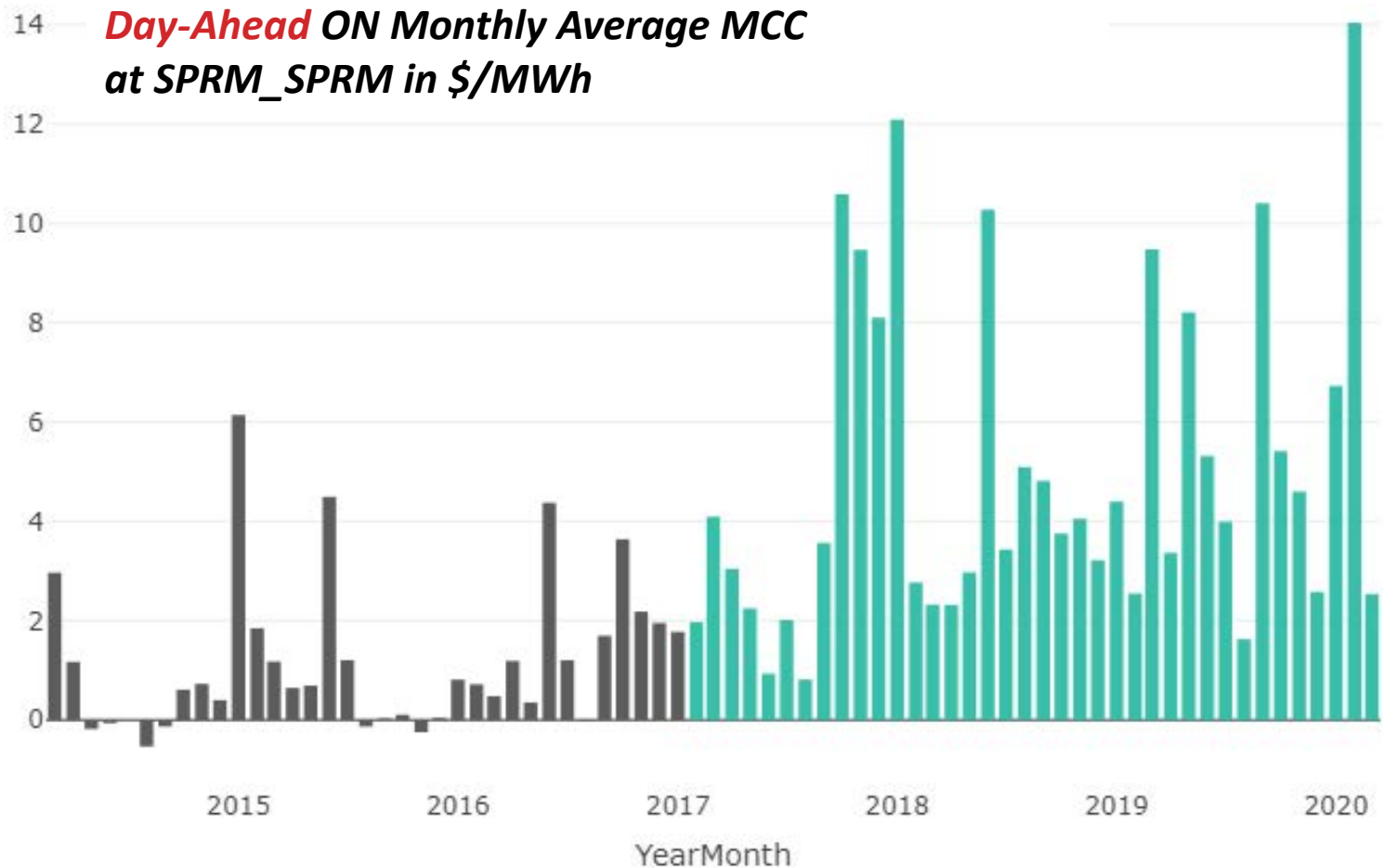
- While M2M process is only happening in Real-Time Market, Day-Ahead Market is trying to guess what may happen in Real-Time
 - Through ‘similar day EIW file’ type of analysis
 - Through Virtuals
 - Resulting in some assumptions of parallel flows on the M2M constraints, indirectly affecting Day-Ahead Market dispatch.

Impact in the Day-Ahead Market (1/2)

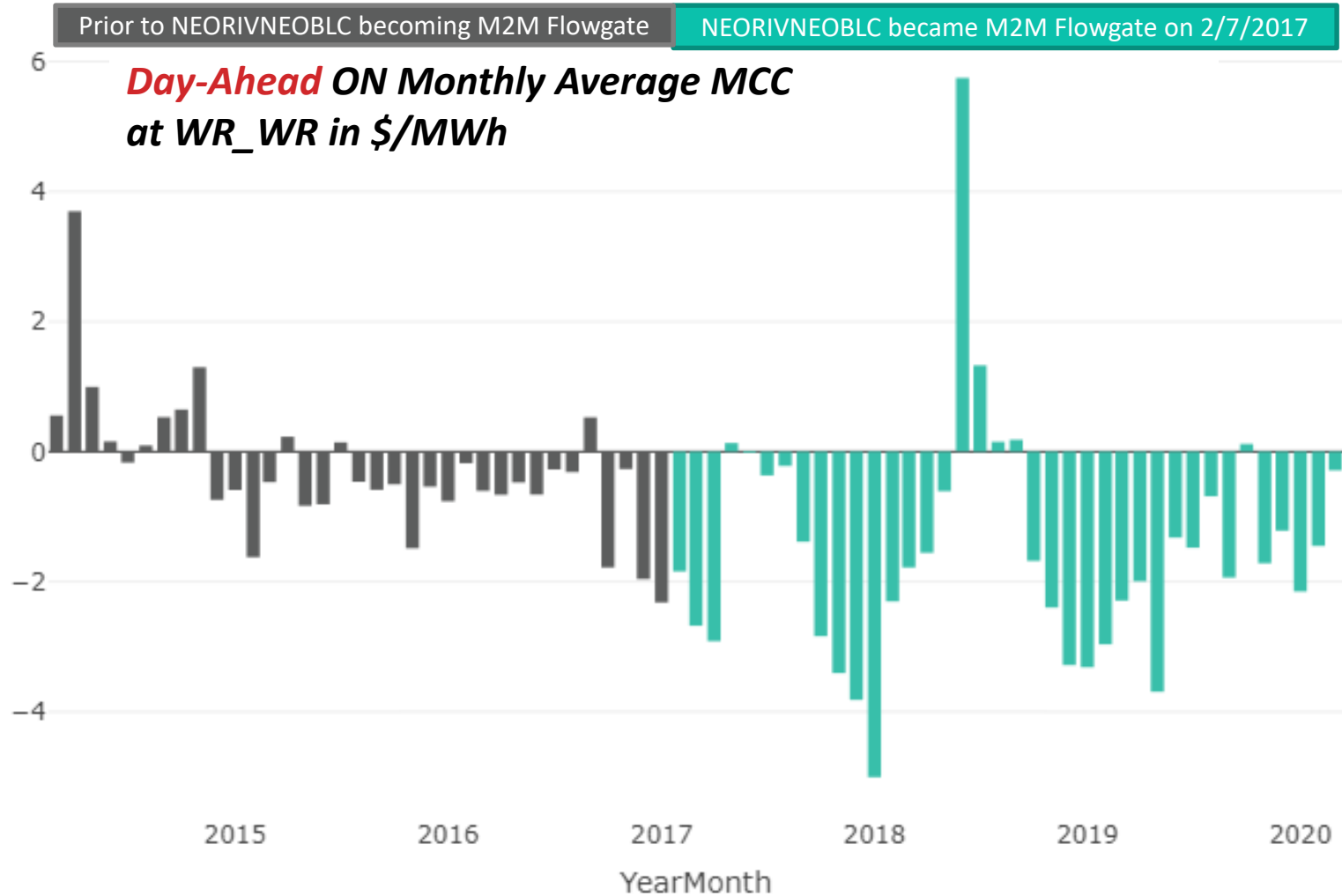
Prior to NEORIVNEOBLC becoming M2M Flowgate

NEORIVNEOBLC became M2M Flowgate on 2/7/2017

Day-Ahead ON Monthly Average MCC at SPRM_SPRM in \$/MWh



Impact in the Day-Ahead Market (2/2)



Questions

- Can SPP Staff explain M2M process from a three-bus example perspective?
- Are there any constraints that are currently not M2M constraints that should be considered
 - Perhaps not meeting the *current* criteria but nonetheless affecting SPP dispatch costs significantly
 - Any congestion impacts on non-M2M flowgates, are borne solely by the MRTO
 - Can Non-M2M flowgates be significantly impacted when flows on M2M flowgates are above Firm Flow Entitlements
- Is today's allocations of the M2M charges/credits equitable?
 - Currently M2M is allocated proportional to the Real-Time MW Injection/Withdrawal, Imports/Exports, and Virtuals.
 - For example: Should a Virtual bidder who benefit from high prices in the Real-Time Market due to M2M be entitled to the M2M payment distribution
 - For example: Should an Entity far away from an M2M constraint be receiving M2M charges / credits the same way as Entity closer to an M2M constraint
 - If the goal of M2M is to “hold harmless” participants in the MRTO, then M2M payments should ideally be distributed based upon the financial harm to the MRTO participants

Potential Impacts – SPP Assessment

- **Potential System Impacts:**
 - M2M, Settlements
- **Potential MCE Performance Impact:**
 - None
- **Potential Complexity:**
 - Design: High
 - Implementation: High
- **Market Philosophy Impacts: Price Formation, Price Convergence, Market Efficiency, Market Transparency, Market Reliability**
 - Market Transparency

Potential Impacts – SPP Assessment

- SPP agrees that currently the M2M payment/credits are currently allocated via load ratio share. This decision was made by the MWG during 2014 after much deliberation around an adequate method of distributing these dollars. SPP is open to reviewing this allocation method but would caution that this has the potential for, as seen in the ARR discussions, devolving into a discussion where the primary concern is not an accurate allocation of the dollars involved but merely an exercise in picking “winners and losers”. If this issue is taken up by the membership, it will important to define the goals. SPP believes the current comments in the submitted initiative do not go far enough to define this. Specifically, cost causation principles and who the allocation of dollars to those most impacted are necessarily synonymous and unwinding congestion at SPP seams will be difficult in defining the cost causers.

SIR23 Market-to-market allocations

SPP MMU Comments

- The MMU supports the evaluation of alternative allocation processes for Market-to-Market (M2M) credits and charges. The current allocation process allocates M2M credits and charges on a \$/MW basis to all generation, load, interchange, and virtual transactions through the settlement of Revenue Neutrality Uplift (RNU). This allocation process does not consistently or adequately align the credits and charges that result from the Joint Operating Agreement (JOA) for the use of a binding M2M flowgate beyond allocated transmission rights with the parties who benefit or are harmed by that use.
- The MMU sees this issue as related to the roadmap initiative to address the allocation of costs (SIR 53). The MMU believes that an evaluation of all credits and charges that are uplifted to the region or a subset of participants should be evaluated to define appropriate guiding principles that drive consistency across all uplifts.

Appendix

Financial Settlements for M2M Events

- Settlements are done after the fact.
- Settlements are determined by the NMRTTO market flow in reference to its flow entitlement
- MRTTO market flow in reference to its flow entitlement is not considered

NMRTTO Market Flow is Greater Than Flow Entitlement

- Payment from NMRTTO to MRTTO
- $\text{Payment} = (\text{Real-Time Market Flow MW} - (\text{Firm Flow Entitlement MW} + \text{Approved MW})) * \text{Transmission Constraint Shadow Price in Monitoring RTOs Dispatch Solution}$
- If NMRTTO entitlement is negative, FFE is capped at 0 MW for settlements purposes

NMERTO Market Flow is Less Than Than Flow Entitlement

- Payment from MRTTO to NMERTO
- Payment = ((Firm Flow Entitlement MW + Approved MW) – Real-Time Market Flow MW) * Transmission Constraint Shadow Price in Non-Monitoring RTOs Dispatch Solution

SIR023 Market-to-market allocations

SPP MMU Comments

- The MMU supports the evaluation of alternative allocation processes for Market-to-Market (M2M) credits and charges. The current allocation process allocates M2M credits and charges on a \$/MW basis to all generation, load, interchange, and virtual transactions through the settlement of Revenue Neutrality Uplift (RNU). This allocation process does not consistently or adequately align the credits and charges that result from the Joint Operating Agreement (JOA) for the use of a binding M2M flowgate beyond allocated transmission rights with the parties who benefit or are harmed by that use.
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