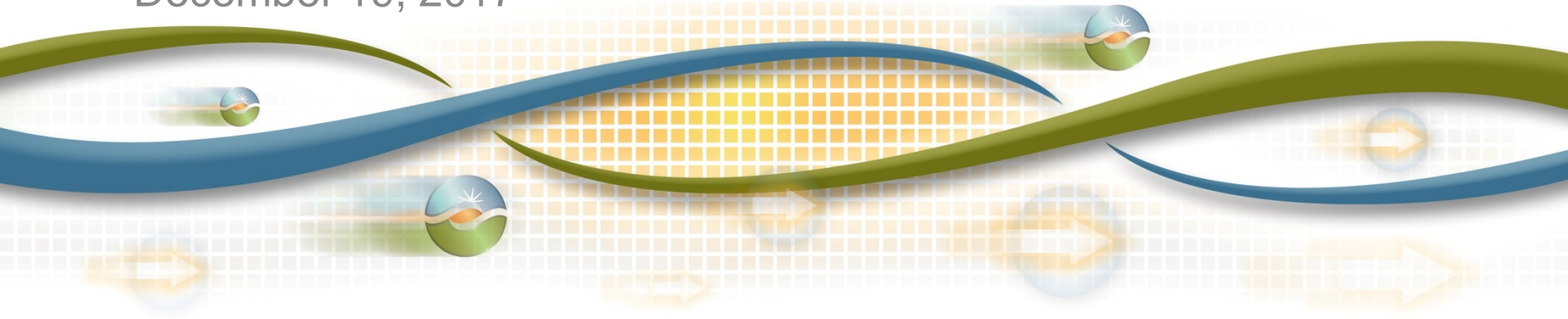


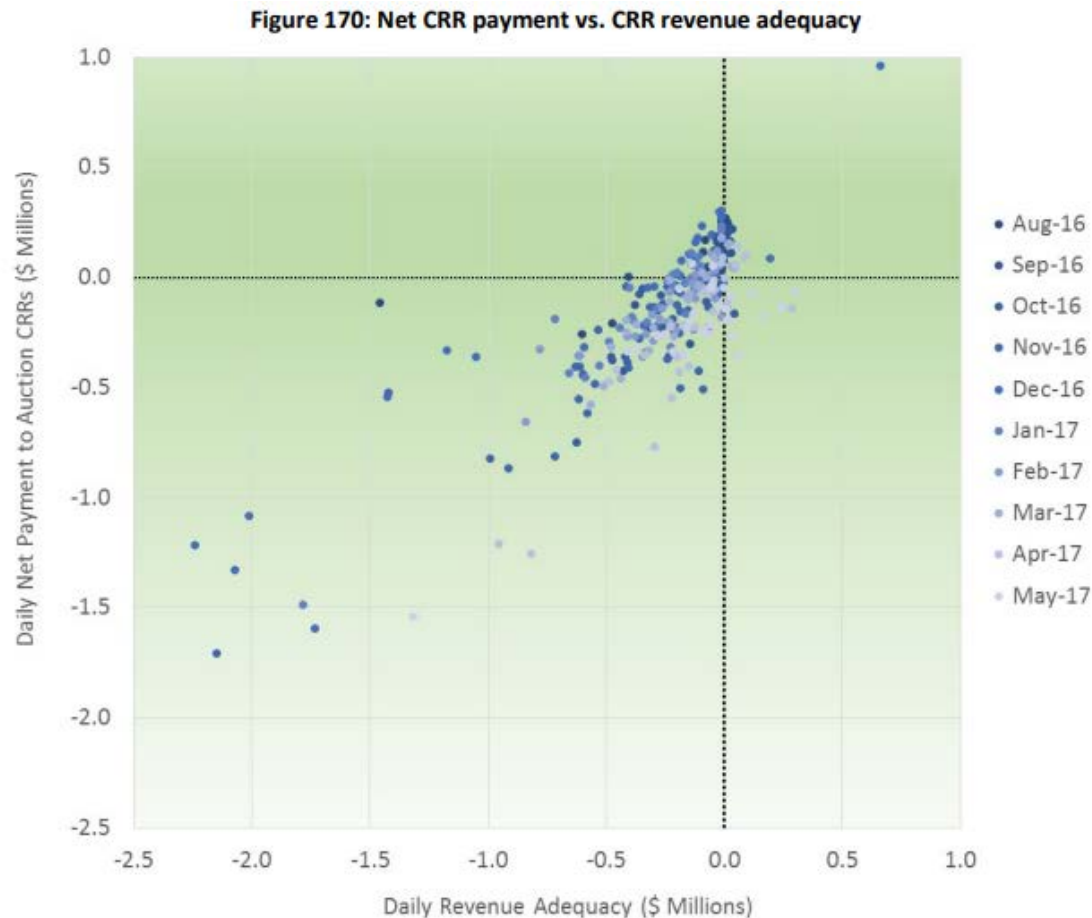
# Addressing revenue inadequacy does not resolve ratepayer losses from flawed CRR auction design

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# ISO analysis shows “strong correlation between CRR revenue adequacy and net CRR payments”<sup>1</sup>



<sup>1</sup>*CRR Auction Analysis Report*, California Independent System Operator, November 21, 2017, p. 203.

Figure 170 from *CRR Auction Analysis Report*, California Independent System Operator, November 21, 2017, p. 200.

# Revenue inadequacy and ratepayer losses from CRR auction are obviously correlated

- By definition, each is directly dependent on 1) quantity of CRRs auctioned and 2) DAM congestion prices
  - Revenue inadequacy and ratepayer losses move together as a direct function of these variables

- Revenue adequacy<sub>k</sub>:

$$\sum_h (Price_{k,h}^{DAM} * (MW_{k,h}^{DAM} - MW_k^{CRR(auctioned+allocated)}))$$

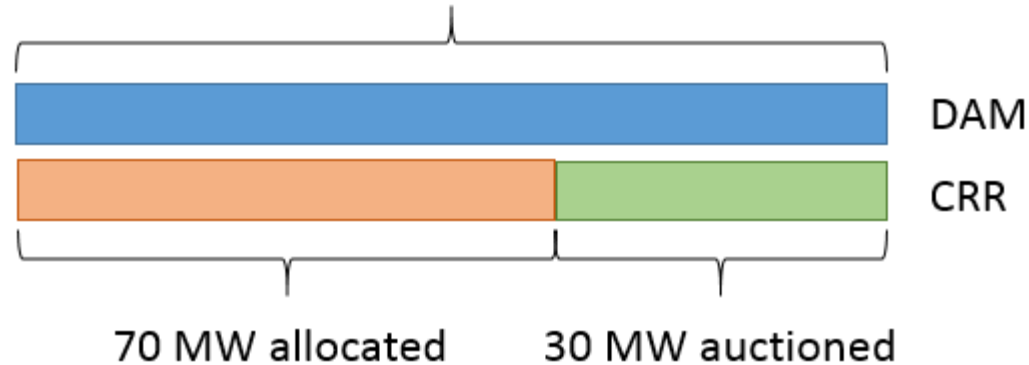
- Ratepayer profits from auction<sub>k</sub>:

$$MW_k^{CRR(auctioned)} * (Price_k^{Auction} - \sum_h Price_{k,h}^{DAM})$$

- If ISO auctions less CRRs → lower revenue inadequacy and lower ratepayer losses
- Lower  $Price_{k,h}^{DAM}$  → lower revenue inadequacy and lower ratepayer losses

# Achieving “revenue adequacy” implies nothing about ratepayer losses from auction

100 MW line limit in DAM every hour of month



- Revenue adequacy<sub>k</sub>:

$$\sum_h (Price_{k,h}^{DAM} * (100 MW_{k,h}^{DAM} - 100 MW_k^{CRR(auctioned+allocated)}))$$

- Perfectly revenue adequate

- Ratepayer profits from auction<sub>k</sub>:

$$30 MW_k^{CRR(auctioned)} * (Price_k^{Auction} - \sum_h Price_{k,h}^{DAM})$$

- Attempting to match CRR model to day-ahead market model:

- Important for *allocated* CRRs
- Misguided for *auctioned* CRRs

# But...what about the correlation between revenue inadequacy and ratepayer losses?

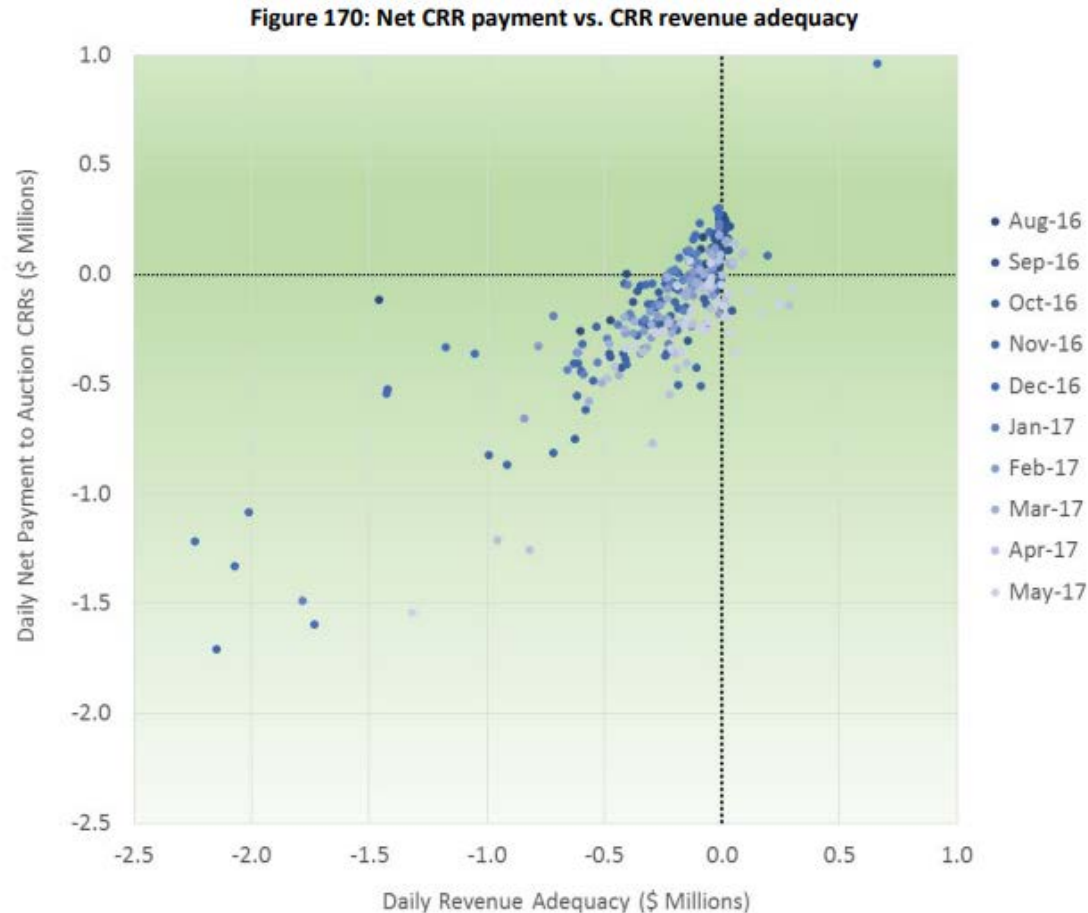
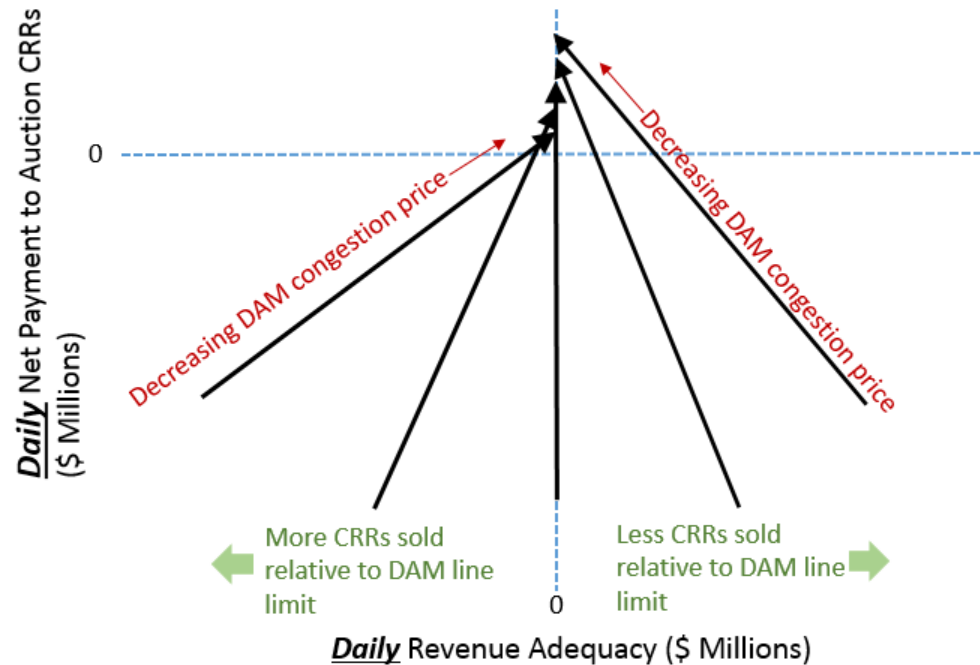


Figure 170 from *CRR Auction Analysis Report*, California Independent System Operator, November 21, 2017, p. 200.

# ISO analysis gives no indication about whether or not achieving revenue adequacy would resolve ratepayer auction losses

Net CRR payment vs. CRR revenue adequacy



- ISO analysis final figure (170) shows:
  - Day-ahead market tended to be revenue inadequate
  - Day-ahead market congestion varied over the days studied
- Question that ISO analysis gives no insight into:
  - What is the quantity of auctioned CRRs that would allow ratepayers to avoid losses? Could it be the magical quantity that achieves revenue adequacy?



# MISO: Ongoing massive ratepayer auction losses despite addressing revenue inadequacy

Planning Period	Percent of DAM Rent Returned	Calendar Year	FTR Funding Percent	Annual DAM Rent	Estimated Auction Losses	
					(Using Start Year Rent)	(Using End Year Rent)
06/10 - 05/11	72%	2010	89%	\$498	\$139	\$141
06/11 - 05/12	75%	2011	104%	\$503	\$126	\$194
06/12 - 05/13	79%	2012	94%	\$778	\$163	\$177
06/13 - 05/14	64%	2013	100%	\$842	\$303	\$520
06/14 - 05/15	89%	2014	99%	\$1,444	\$159	\$83
06/15 - 05/16	83%	2015	104%	\$751	\$128	\$125
06/16 - 04/17	81%	2016	108%	\$737	\$140	
<b>Average</b>	<b>78%</b>		<b>100%</b>	<b>\$793</b>	<b>\$165</b>	<b>\$207</b>

- Should CAISO ratepayers continue to lose \$75 million/year by following MISO in addressing revenue inadequacy without resolving ratepayer auction losses?
- Fundamentally flawed nationwide FTR auction design
  - Flaw: Auctioned quantity based on estimate of day-ahead transmission model
  - Replace with a market for hedges based on transactions between willing buyers and sellers