



CRR Study Working Group

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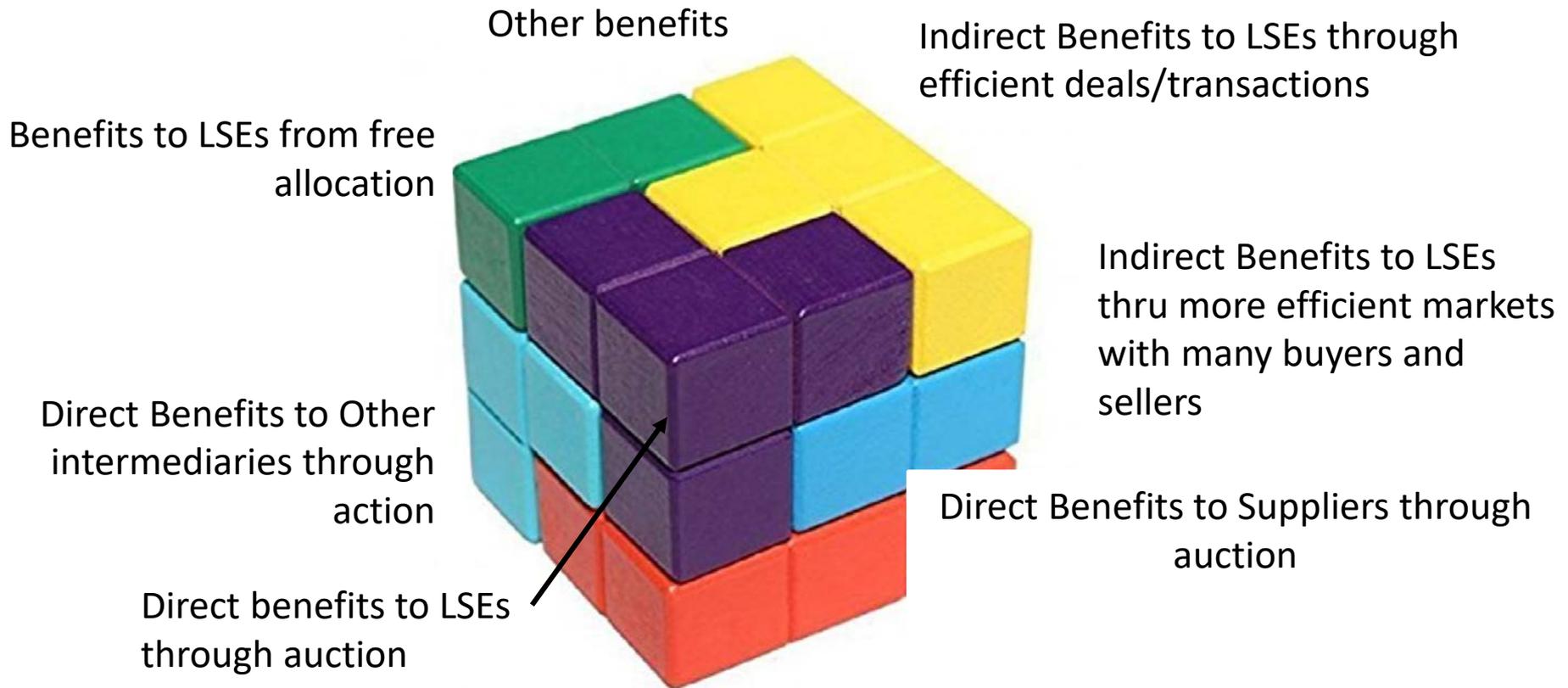
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DMM Analysis – WPTF reaction

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- Believe that DMM’s analysis is unduly narrow; only one component of overall benefits of CRR markets
 - Examines only one component of value and cost
 - Does not seek to flesh out root causes
 - Does not recognize other economic benefits
 - Believe that DMM’s remedy is not well analyzed/supported
 - DMM does not demonstrate linkage between “remedy” and source of gap between CRR payouts and DA congestion rents
 - DMM does not address adverse impacts of such remedy on balance of market
 - DMM does not address buyer market power impacts of proposed remedy
 - For later today:
 - WPTF also agrees with much of Dr. Harvey’s analysis and explanation (e.g., legitimate need for hedging; clearing prices less than payouts may be rational)
 - We’ll offer suggestions for further analysis and study

The Totality of CRR Benefits is a Collection of Positive Impacts with Several Dimensions



Total Value of CRR Processes

WPTF believes focus in DMM analysis is an overly narrow part of full benefits of CRR processes

DMM further limits their focus to a sub element of the potential benefits to LSEs through the auction:

- The share believed to be transferred to others
- Though not explicit... the share of that which cannot be remedied



The balance of the benefits are treated as if they are non-existent or have no value

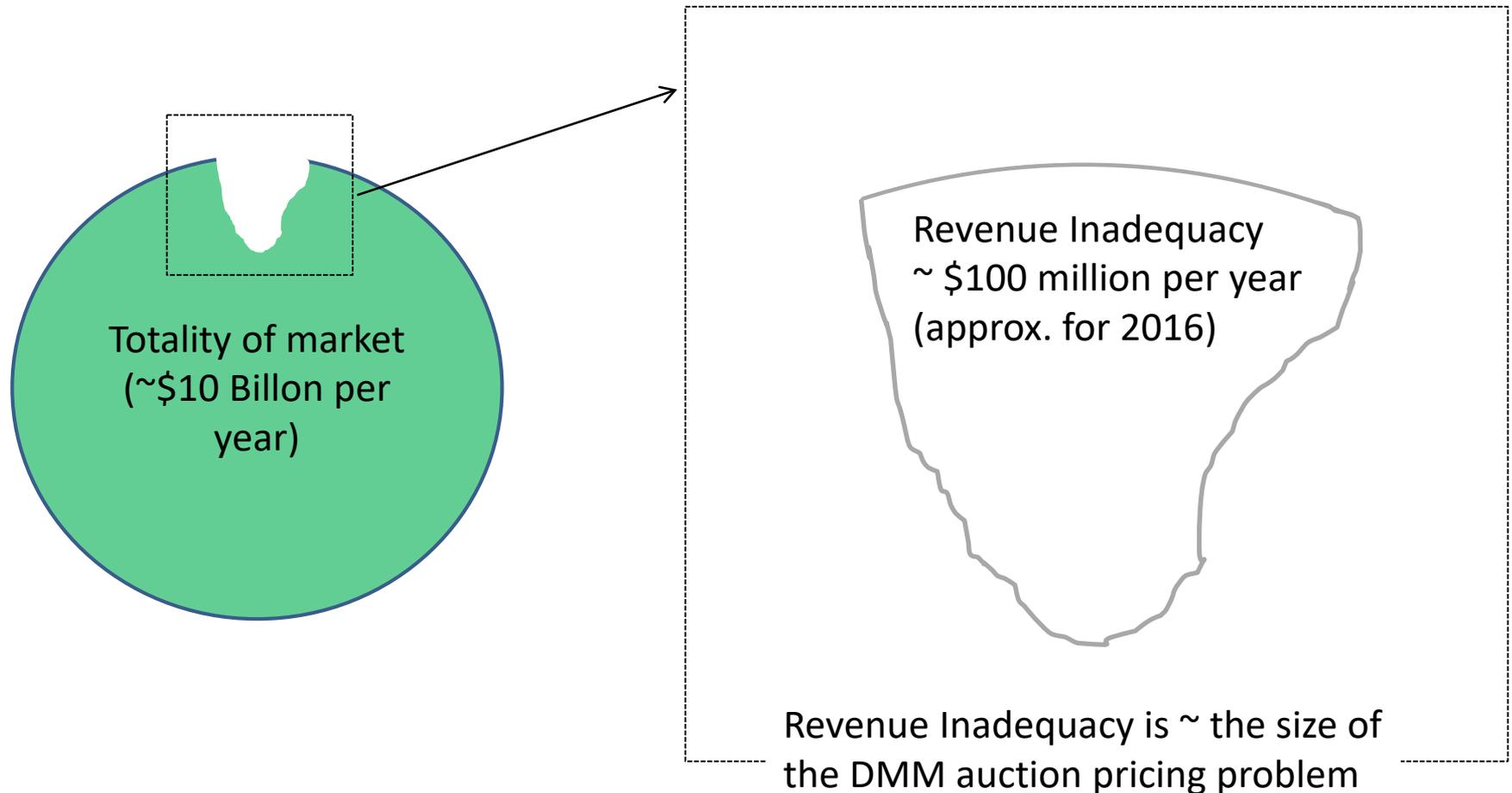


DMM's analysis does not seek to reveal root causes

- The market efficiency and adverse impacts can appear in several respects
 1. A change in capacity between the auction and the DA creates inefficiency and can lead to revenue inadequacy
 2. A change in the cost to resolve constraints after the auction can create a Gap between the auction price and the congestion rent
 3. Both 1. and 2. can cause auction prices paid to be less than DA congestion rents
 4. DMM's analysis is not digging into the root causes, including those driving Revenue Inadequacy*

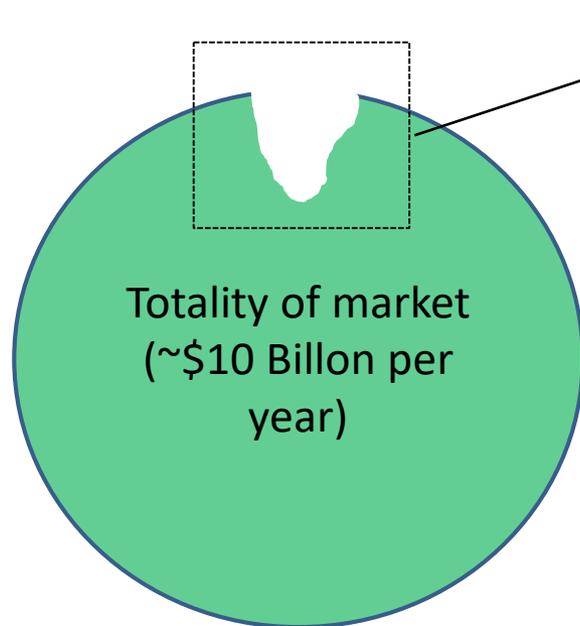
* "The relevant question for ratepayers is *not* how total payments to CRRs compare to total day-ahead congestion rent (i.e. it is not a question of revenue adequacy). The relevant question for ratepayers is how the payments ratepayers are obligated to make to auctioned CRR holders compare to the CRR auction revenues ratepayers receive." [p. 7]

DMM's analysis does not seek to reveal root causes: I.E. Revenue Inadequacy

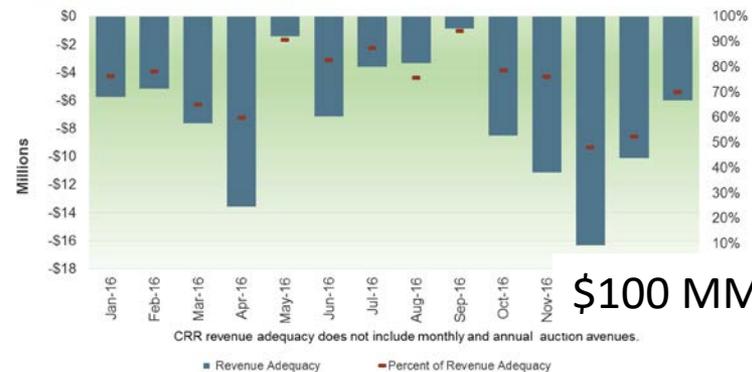


Note: 100 million seconds ago was in 2014. 10 billion seconds ago was in the 1700s.

DMM's analysis does not seek to reveal root causes: I.E. Revenue Inadequacy



Congestion revenue rights market revenue inadequacy without auction revenues.



California ISO

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Revenue inadequacy ~ \$100 million per year (approx. for 2016)

Revenue Inadequacy is ~ the size of the DMM auction pricing problem

Note: 100 million seconds ago was in 2014. 10 billion seconds ago was in the 1700s.

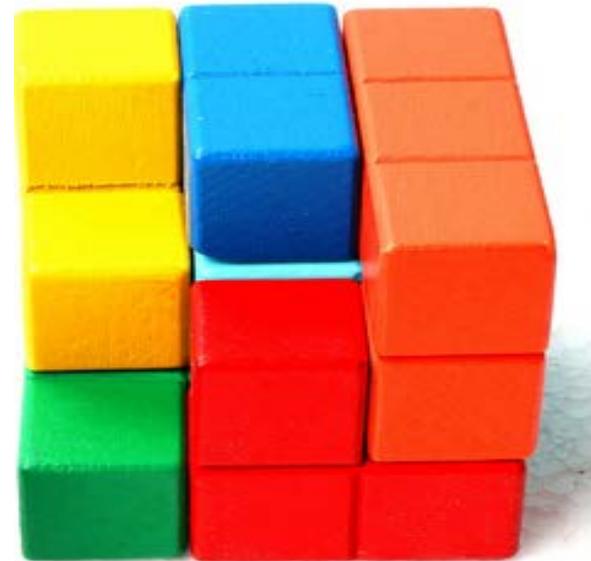
DMM's remedy is not well analyzed/supported

- DMM's assessment to date concludes that eliminating the open auction is an appropriate remedy
 - DMM claims that with forward price swaps market participants can have an equivalent to the CRR market
 - And that ISO action should only accommodate willing bilateral trades
- To prove or disprove DMM's conclusions WPTF believes the ISO needs to:
 - Fold in the revenue inadequacy issue and consider its relationship to DMM's auction price issue, as it has a large impact on LSEs, independent of auction
 - Examine further DMM's premise about forward price swaps, given that such swaps are already available in the bilateral market; the ISO needs to do nothing in this regard
 - Note the importance of the CRR processes in a nodal market because of the many sources and many sinks
 - Bilateral markets cannot emulate a simultaneous feasibility process
 - How does a small LSE, or supplier find a trading partner?

DMM's remedy is not well analyzed/supported

- DMM's assessment to date of appropriate remedy also seems to not look at impacts that eliminating the CRR products and CRR participants will have on the balance of the market; it is important for the CAISO to do so
- As such it presumes there is no value of, or no harm that would be done by, removing the accessibility of the CRR product to non LSEs; that should be examined as well

Proper assessment should address these other market impacts



In Short, DMM has only examined on part of the set of benefits of the CRR processes that exist today

CRR auction proceeds < DA congestion & low LSE participation in CRR process = **bad** according to DMM

- No explicit investigation of root causes for CRR clearing prices < DA congestion
- Presumption that LSEs' gains is the correct metric
 - E.g., as opposed to for example – societal benefit or cost
- No measure of adjunct benefits accruing to LSEs given CRR availability to balance of market
- No analysis of remedies

Since it was limited to a “narrow slice of the pie” DMM analysis is insufficient cause for action such as reducing or eliminating CRR functionality; WTPF encourages a full analysis before conclusions are reached on policy changes

Scott Harvey Discussion

(Slide 1 of 5)

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- Agree that Scott's landed on the type of analysis needed for the narrow question of risk premium, although WPTF believes uncovering root causes is very important.
 - Agree with key drivers in the risk premium [SH16]
 - Auction modeling issues [SH 20]
 - Constraints not modeled or enforced on the auction grid
 - Differences in grid configuration between auction model and day-ahead market
 - Differences in modeled loss flows between the auction model and day-ahead market

Scott Harvey Discussion

(Slide 2 of 5)

- 
- Agree with his questions [SH22]
 - ...[are] all CRRs [constraints] sold in auctions [at premium] or is it generally the case only for certain types of CRRs?
 - What are the reasons for this low valuation?
 - Is there a reason this low valuation is an appropriate outcome?
 - If the low valuation it is not an appropriate outcome, what changes should be implemented in the CRR auction or market design?

Scott Harvey Discussion

(Slide 3 of 5)

- Generally agree with his methodology [SH23 - 28], however it might be useful to organize investigation based on the size of the gap between DA payouts and auction revenues (“Gap”)
 - E.g., makes sense to start with Monthly to DA Gap, but if Gap is significantly influenced by Annual to Monthly premiums then need to look there as well
 - Also makes sense to look constraint by constraint but perhaps starting with highest Gaps and working to less significant Gaps
- Also seems fruitful to start looking for categories of causes for the Gaps (nodal constraints, outages not modeled, etc.)
- Do not excluded negative Gaps - those influence participation as well

Scott Harvey Discussion

(Slide 4 of 5)

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- Agree that there are a range of next steps that may reveal themselves [SH 36]:
 - Suggest changes in the California ISO CRR allocation or auction process or modeling
 - Suggest further more detailed analysis of the modeling of particular constraints or CRRs in the auction
 - Suggest more detailed analysis of the modeling of CRR flows in the allocation and auction model
 - Given that we're peeling the onion, so to speak, the analysis of the Gap should be seen as an iterative process with continued stakeholder feedback

Scott Harvey Discussion

(Slide 5 of 5)

- Other pieces not in Scott's recommended analysis but that WPTF believes are important
 - Time sequence of Gap and correlation with other market/operational changes
 - Can reveal causal relationships
 - Time sequence of constraints not modeled in one monthly auction but modeled in subsequent monthly auctions
 - Liquidity analysis
 - What are participation levels, have they changed over time, what's driving the participation levels if low?
 - Volatility
 - How volatile are DA constraint shadow prices? Is the volatility over time predictable
 - All other pieces of Tetris Block

More on these in subsequent discussions today

Scoping

- Important Qualities

- Characterize broad issue/problem statement to inform useful analysis

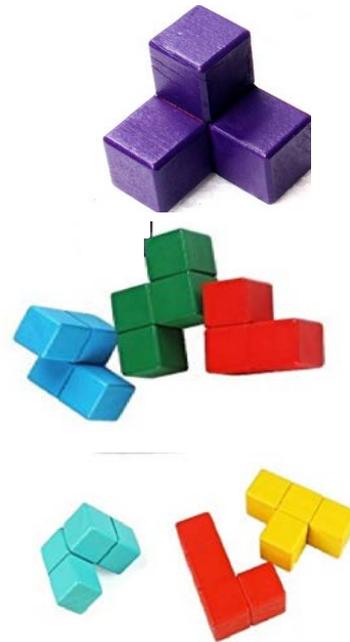
- Is the question: Is the auction worthwhile? If so, cannot answer it only with isolated Gap analysis

- Is the question: What can we learn about the auction price to DA congestion price to better the markets? If so, then may be able start with this one aspect

- To address broader question(s) will likely require multi-faceted “analysis”

Scoping

- To address broader question(s) will likely require multi-faceted “analysis”
- Quantifiable
 - Aspects that can be quantified and specific
 - Aspects that may be quantifiable but less specific/rigorous
- Not Quantifiable
 - Aspects that may best be addressed qualitatively



Scoping

Example mapping of areas of benefit to categories

Quantifiable	Quasi-quantifiable	Not Quantifiable
Gap analysis	Hedging	Prudent Risk Management
Value of allocated CRRs to market	Risk Premiums	Short and long term infrastructure investment
Liquidity of auction	Project Finance (PPAs, RFPs, etc.)	FERC's perspective re: PJM filing

Scoping/Methodology

CAISO's questions in this area seem to pertain to the Auction-to-DA "Gap" analysis (Our points here pertain to that subset of the assessment; Notwithstanding the point that this is just a subset.)



- Focus on Gap between Auction and DA congestion
- Determine if Gap is substantially attributable to Annual or Monthly process (as Scott indicated, Monthly should eliminate more exogenous effects and the time value of money effects)
- Makes sense to look constraint by constraint but perhaps starting with highest Gaps and working to less significant Gaps
- Look for categories of causes for the Gaps (nodal constraints, outages not modeled, etc.)

Scoping/Methodology

Other pieces not in Scott's recommended analysis, but that WPTF believes are important

- Time sequence of Gap and correlation with other market/operational changes
 - Can reveal causal relationships
- Time sequence of constraints not modeled in one monthly auction but modeled in subsequent monthly auctions
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 - What are participation levels, have they changed over time, what's driving the participation levels if low?
- Volatility
 - How volatile are DA constraint shadow prices? Is the volatility over time predictable
- All other pieces of Tetris Block
 - What is the value of the CRRs given to LSEs in the free allocation process?
 - Characterizing the value of other market benefits



Scoping/Methodology

- 
- See what remedies reveal themselves from the analysis
 - What can be done to reduce the Gap?
 - What can be done to increase the liquidity in the auction? (Which may itself improve when Gap is reduced)
 - What steps are appropriate to take and then await response before further assessments of needs for change ?

Conclusions Regarding Scoping/Methodology

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- Prior to any conclusions that functionality should be reduced, process should consider both the costs and benefits to all sectors (suppliers and load) and from all aspects of the market (allocation and auction)
 - Getting to the root causes of the Gap between auction and DA will provide valuable information
 - Its important for the ISO to conduct the Gap analysis, looking at it from several angles (e.g., modeled vs non-modeled constraints, constraint type, time sequence, etc.)
 - It is also important to study some of the less quantifiable benefits and costs (Risk management, Financing, etc.)
 - The study process should be iterative with multiple opportunities to keep stakeholder engaged in the development, challenges, and preliminary findings