



Comments of Pacific Gas and Electric Company on CRR Auction Analysis Report

Submitted by	Company	Date Submitted
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Pacific Gas and Electric Company (PG&E) appreciates the opportunity to comment on CAISO’s CRR Auction Analysis Report released on November 21, 2017.

Given the persistent losses to ratepayers attributed to the CRR auction, PG&E appreciates the CAISO conducting an assessment of the CRR auction design. The magnitude and persistence of losses borne by California ratepayers associated with CRRs sold in auction (CRRs sold in auction at significant discounts to DA Congestion Rent and Revenue Inadequacy) is of utmost concern to PG&E and inherent issues with the current auction design should be addressed expeditiously.

The CAISO CRR Auction Analysis Report suggests that the majority of revenue shortfall for auctioned CRRs is driven by modelling inconsistencies between CRR and Day-ahead transmission models. PG&E believes the majority of these shortfalls could not have been mitigated by improved modelling practices or processes – CRR auctions are run a year or month in advance of the Day-ahead market with two network models (on and off peak) representing a quarter or month of day-ahead market hours. By contrast, the Day-ahead market is run with potentially 24 different network models per day. Transmission models are guaranteed to be inconsistent, rendering the majority of revenue inadequacy unavoidable. It is inappropriate for load serving entities (LSEs) to bear the risks associated with unavoidable modelling inconsistencies and associated market impacts – an equitable market structure should allow for transactions between willing counterparties only, who can and are willing to manage their own risk in engaging in CRR transactions.

PG&E urges CAISO to quickly pursue reforms the CRR auction and mitigate persistent losses to California ratepayers. Under the current CRR auction design there is little measurable benefit to LSEs, yet LSEs bear significant risks regardless of their participation in auctions. PG&E believes the CAISO’s analysis provides a basis for elimination of the CRR auction or at least major reforms to the CRR market design. PG&E expands upon the following points in the subsequent section:

- 1. The CAISO analysis attributes the majority of CRR revenue shortfall to modeling discrepancies between the CRR Full Network Model (FNM) and the corresponding Day-ahead Full Network Models. However, it is unlikely that changes to modeling or outage processes would significantly alleviate revenue shortfall.**



2. Overall, auctioned CRRs are profitable and clearly benefit a subset of market participants at the expense of LSEs who are forced to sell transmission capacity and fully fund auction CRRs. Persistent market divergence speaks to inherent issues with the CRR market design.
3. In contrast to today's CRR auction design, a CRR market should allow for an equitable sharing of benefits and risks, facilitate transactions between willing counterparties and allow parties to manage their own risk, while providing market participants a platform to obtain hedges for physical power.

Detailed Comments:

1. **The CAISO analysis attributes the majority of CRR revenue shortfall to modeling discrepancies between the CRR Full Network Model (FNM) and the corresponding Day-ahead Full Network Models. However, it is unlikely that changes to modeling or outages processes would significantly alleviate revenue shortfall.**

The CAISO identifies modeling discrepancies as the main drivers of CRR revenue inadequacy and underfunding and notes that drivers of modeling discrepancies are neither consistent nor predictable. While CAISO provides extensive details on outage modeling and scheduling, its month-by-month analyses attribute only a small subset of overall shortfalls to late-reported outages under current CAISO requirements.

CRR auction transmission models (one for on-peak, and one for off-peak) represent an entire month or quarter of day-ahead hourly intervals. Many discrepancies between CRR and Day-ahead transmission models are unavoidable. Though CAISO does not specifically call out unavoidable modelling discrepancies, PG&E believes that any outages lasting less than the auction duration (e.g. 1 month, 1 quarter) and associated modeling assumptions for intra-period outages (e.g. pro-rata de-rates for outages less than 10 days and greater than 24 hours), any forced outages that arise suddenly, and any immediate need for CAISO to enforce additional constraints or nomograms in the day-ahead market will result in unavoidable modelling discrepancies and potential revenue inadequacy. In CAISO's 10 month analyses of CRR auction performance (August 2016 to May 2017) reasons attributed to modeling discrepancies for constraints that were either not binding or not enforced in monthly auctions, or that drove significant payments to CRRs are as follows:



Month	Count of Line-Periods	Higher Limit	Auction Economics	Late/Missed Enforcement of Nomogram	Late/Missed Outage		
					Less than 24hrs	Less than 10 days, On Time	Late report - per CAISO requirements
Aug-16	25	5	15	2	3	0	0
Sep-16	21	4	12	3	2	0	0
Oct-16	23	2	13	8	0	0	0
Nov-16	27	5	11	0	0	1	10
Dec-16	20	1	6	5	4	2	2
Jan-17	21	0	11	5	2	0	3
Feb-17	21	4	7	4	1	2	3*
Mar-17	25	5	14	4	0	2	0
Apr-17	23	4	12	3	0	0	4
May-17	21	6	14	1	0	0	0
TOTALS	227	36	115	35	12	7	22

*Three of four outages associated with one constraint here lasted <24 hours

This shows that only 9.7% (22 divided by 227) of top constraints-periods driving transmission modeling discrepancies between the CRR and DA FNMs are attributed to late outages per current CAISO requirements. The remainder of late or missed outages are short duration and would not be modeled in the CRR auction, or were reported on time. Top constraints attributed to late reported outages account for about \$13.8M of the total \$47.6M net payments to CRR holders during this timeframe. Further, the CAISO has not specified whether these official late outages were due to forced outages, outages not currently required to be submitted in the CRR timeframe (<230kV or less and not on the list in 3210B) or other conditions that could not have been foreseen far in advance.

PG&E stresses the following points when reviewing outage scheduling or modelling processes:

- If outage reporting processes are changed (e.g. to require reporting of outages less than 24 hours in duration within some time interval or to require reporting on lower voltage outages), how would these outages be actually modeled in the CRR auction full network model? CAISO does acknowledge that “There were multiple outages that have a short duration that impact the day-ahead congestion prices but even if submitted with plenty of time for their consideration in the CRR auctions, there is no easy and clear way to account for them in the model of the CRR auction.”¹ Further, it is possible that the modelling or change in modelling of these outages could actually exacerbate revenue inadequacy. For example if CAISO did model an outage less than 24 hours in the CRR FNM, this outage would not be present in the DA FNM for the majority of the month, introducing the counterfactual modelling discrepancy. Additionally, by pro-rating derating outages lasting less than 10 days, there are inherent modelling discrepancies between the CRR and DA FNMs – expanding this type of process is not guaranteed to mitigate revenue inadequacy.
- In the NYISO Transmission Congestion Contract (TCC) Market, cost-causation based allocation of revenue inadequacy to transmission owners is intended to incent transmission owners to report outages in a timely manner and plan outages opportunistically. However, even

¹ CAISO CRR Analysis Report. Page 202.



with this incentive structure in place, the NYISO TCC market has incurred millions of dollars of revenue inadequacy each year². NYISO's enhanced incentive to report outages does not mitigate discrepancies between CRR and Day-ahead transmission models.

Ultimately PG&E agrees with CAISO that modeling discrepancies are not predictable or consistent, and there is a question of how and if intra-period constraints can be correctly modeled in the CRR FNM. CAISO further notes that "Once one given auction has been impacted by a model issue, the overall economics of that auction may be distorted since enforcing or not enforcing one specific constraint may ultimately impact the pricing of other transmission constraints since the auction result is based on a simultaneous feasibility test."³ PG&E believes to the extent that modelling inconsistencies cannot be addressed and these modeling discrepancies impact the overall CRR auction economics, there is an inherent and unavoidable problem with the design of the CRR auction.

PG&E urges CAISO not to spend time pursuing small process changes to address modeling inconsistencies as any changes taken through the stakeholder process, regardless of how extensive changes are, take time to develop, file at FERC, and implement. PG&E believes that larger-scale changes are necessary to address the core of CRR auction issues and these should be prioritized.

2. Overall, auctioned CRRs are profitable and clearly benefit a subset of market participants at the expense of LSEs who are forced to sell transmission capacity and fully fund auction CRRs. Persistent market divergence speaks to inherent issues with the CRR market design.

CAISO finds auction CRRs receive net negative payments only 17% of the time. Therefore auctioned CRRs receive net zero or net positive payments 83% of the time. Additionally, market participants incorporate CRRs into portfolios and CRRs should not be viewed as standalone instruments. CAISO's analysis does not dive into ownership of CRRs when evaluating individual CRR performance nor does it aggregate CRRs into portfolios based on ownership. While a small set of CRRs are unprofitable, CAISO should consider that certain market participant portfolios are likely to be profitable overall. The Department of Market Monitoring (DMM) analyzed net CRR payments by portfolio for a September 2017 Board Memo⁴. Figure 6 of this memo clearly shows that portfolios of non-LSE CRRs skew toward being net profitable. Overall, however, the CAISO report supports DMM's findings that auction revenues are persistently lower than payments to auction CRRs.⁵ CAISO also finds that net CRR payments and revenue inadequacy are correlated, driven by single events or modelling inconsistencies. Reiterating points in Section 1, PG&E expects that the majority of modelling discrepancies driving these payouts cannot be effectively mitigated.

² \$100M in DA Congestion Shortfalls in 2016; \$37M in 2015; \$69M in 2014

³ CAISO CRR Analysis Report. Page 203.

⁴ "Department of Market Monitoring update". September 13, 2017.

http://www.caiso.com/Documents/Department_MarketMonitoringUpdate-Sep2017.pdf

⁵ CAISO CRR Analysis Report. Page 7.



CAISO also shows that in general, auction CRRs clear at very low prices (Most CRR paths in monthly auctions clear between +/- \$0.25/MWh; ~ 90% of CRR volume in monthly auctions clears between \$0/MWh and \$1/MWh)⁶. CAISO also notes “A large volume of CRRs released in the auction are for CRR definitions with very few awards. Indeed, about half of the CRR volume released in the auctions are based on CRR definitions with one single award. This opens the question on how much liquidity or hedging the auctions may be generally providing with such large volume of single definition awards.”⁷ This suggests CRR valuation issues exist that are driven by lack of participation at the individual path level.

Given these findings, PG&E believes inherent valuation issues persist under the current CRR auction design. Even with increased participation, CRR/Day-ahead market convergence issues continue, indicative of flaws in the current design. A subset of market participants reap significant benefits and incur little risk participating in the CRR auction, at the expense of LSEs who fully fund CRRs purchased in auction. Because of these persistent divergences and no clear remedy to mitigate them, major reforms of the CRR auction should be considered in the stakeholder process.

3. In contrast to today’s CRR auction design, a CRR market should allow for an equitable sharing of benefits and risks, facilitate transactions between willing counterparties and allow parties to manage their own risk, while providing market participants a platform to obtain hedges for physical power.

A CRR market should (as any market should) facilitate transactions among **willing** counterparties – counterparties who are each willing and able to reflect their own assessment of risk to engage in those transactions. The current CRR auction design forces transmission ratepayers to sell transmission capacity not used in the CRR allocation process in the auction. LSE ratepayers are therefore forced to absorb risk and guarantee full funding for auction CRRs while they may not be willing counterparties to those transactions. Initial valuation of auction transmission capacity at \$0 contributes to a significant volume of auction CRRs clearing at low prices while ratepayers fund substantial payouts to CRR owners *and* are responsible for covering revenue shortfalls.

Further, the existence of unavoidable modelling inconsistencies and associated shortfalls brings to question why an auction needs to be overlaid on a full network model and what benefits this design construct provides. For LSEs, PG&E only sees downside risk associated with modelling inconsistencies and subsequent revenue inadequacy. If parties utilize CRRs to hedge point to point basis risk, there is no reason why sufficient hedges cannot be purchased through a bilateral market as the DMM proposes or a limited auction, such as one with CRRs limited to sourcing and sinking at LAPs or trading hubs at which willing counterparties could offer to buy and sell CRRs that the auction

⁶ CAISO CRR Auction Analysis Report. Pages 33-35.

⁷ CAISO CRR Auction Analysis Report. Page 10.



could clear. These types of market constructs would ensure market revenue neutrality, allow willing counterparties to transact, introduce equitable sharing of risk, and not subject ratepayers to risk associated with revenue inadequacy driven by unavoidable short-term modelling discrepancies.

PG&E also notes that the existence of the current CAISO CRR auction (with revenue adequacy guaranteed by ratepayers) is likely preventing other competing markets from developing. DMM analysis indicates that CRRs, in aggregate, are being underpriced in the CRR auction at the expense of ratepayers⁸. This dissuades CAISO CRR auction participants from engaging in alternative or competing markets which cannot subsidize its CRR prices. The absence of a CRR auction operated by CAISO would likely result in more robust markets (most likely bilateral) for CRR-type products.

PG&E agrees with CAISO's comment that "The purpose of CRRs is to provide a hedging mechanism to entities directly exposed to congestion in the day-ahead market or to those managing risk associated capacity or energy based contracts that could be exposed to congestion."⁹ The CRR market design should ensure that physical participants can still obtain valuable hedges. CAISO found that about 56 percent of all net CRR payments accrued on CRRs awarded from generation location to generation location, while over 85 percent of all net CRR payment accrued on CRRs from supply to supply locations.¹⁰ Additionally, CAISO found that "There is a set of CRRs in every auction that clear at \$0 prices. Usually these CRRs have sources and sinks located close one to another, electrically speaking."¹¹ CAISO does not provide insight into whether the transactions described above could represent actual hedges (as opposed to pure speculation). However, to the extent that these auctioned CRRs are not representative of hedges for physical power, PG&E questions the value derived by CAISO auctioning off this transmission capacity on behalf of ratepayers. How do these transactions provide overall benefit to customers as some entities have posited?

From an LSE perspective, auctioned CRRs today pose significant risk of financial losses to LSE and ultimately LSE ratepayers. Under the current design, it is unreasonable to expect that LSE ratepayers bear significant risk of covering shortfalls associated with both misaligned transmission models and subsequent impacts to market economics, while other parties benefitting from CRR auction transactions bear little. Additionally, if CRRs are intended to benefit consumers in the long run, CAISO should consider that ratepayers would directly benefit by elimination of the CRR auction or major reform of its design.

⁸ "Shortcomings in the congestion revenue right auction design." CAISO Department of Market Monitoring. Nov 28, 2016.

⁹ CAISO CRR Auction Analysis Report. Page 201.

¹⁰ CAISO CRR Auction Analysis Report. Page 6.

¹¹ CAISO CRR Auction Analysis Report. Page 10.