

Comments of Powerex Corp. on Congestion Revenue Rights Working Group

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Powerex appreciates the opportunity to submit comments on CAISO's April 18, 2017 Working Group on Congestion Revenue Right ("CRR") auction efficiency (the "April 18th Working Group"). The goal of the April 18th Working Group was to begin a dialogue about the performance and efficiency of the current CRR design, including the issues identified in the Department of Market Monitoring's ("DMM") November 28, 2016 White Paper, "Shortcomings in the Congestion Revenue Right Auction Design" ("DMM White Paper"). At the April 18th Working Group meeting, CAISO solicited stakeholder views on the efficacy of the existing CRR design and the analytical framework that should be used to measure performance and to identify potential causes of inefficient outcomes.

Powerex strongly supports CAISO's decision to convene a stakeholder proceeding focused on the efficiency of the existing CRR design as the initial step in evaluating and improving the overall CRR framework.¹ In particular, Powerex agrees that the performance of the CRR market in recent years indicates that there may be opportunities to improve the efficiency of the existing framework for defining, allocating and auctioning CRRs. More specifically, systemic CRR revenue inadequacy and persistently low CRR auction valuations relative to CRR payouts indicate that changes to the CRR framework may be necessary to ensure that CRRs serve their intended purpose in an efficient manner.

Powerex also supports CAISO's decision to begin this proceeding with a discussion of the analytical framework that should be used to evaluate the efficiency and performance of the existing CRR framework. Powerex agrees with CAISO that it would be premature to begin a discussion of potential solutions or enhancements before CAISO and stakeholders have had an opportunity to meaningfully evaluate the performance of the existing CRR framework, the nature of any perceived inefficiencies, and the factors driving CRR performance.

As discussed further below, Powerex believes that additional analyses of the factors driving CRR revenue inadequacy and persistently low aggregate CRR auction valuations are required in order for CAISO and stakeholders to engage in a meaningful dialogue about potential changes to the CRR framework. Powerex believes, however, that any analysis of the efficiency of the CRR auction and consideration of potential

¹ A comprehensive evaluation of the existing CRR framework must assess the performance of CRRs, the CRR auction, and the CRR allocation process.

improvements must be rooted in a comprehensive understanding of the role of CRRs in wholesale markets and the benefits that they confer on market participants.

I. The Purpose and Benefits of CRRs in an Organized Market

Prior to providing more detailed comments on the analytical framework for analyzing the performance of the existing CRR market, Powerex believes that it is important to clearly set out the need for CRRs and the role that they can play in an organized market. Any assessment of CRR “performance” will be necessarily incomplete if it omits any of these core functions and objectives of CRRs.

A. CRRs are a Critical Component of Open Access

CRRs must first be viewed in the context of the broader principle of open access to transmission service. As FERC has recognized in numerous cases, non-discriminatory open access to transmission service is a foundational principle necessary for efficient and competitive wholesale markets for electric energy.² For that reason, in the decades following issuance of Order No. 888, FERC has consistently taken steps to eliminate undue discrimination and to ensure that all market participants have comparable access to transmission service. Moreover, FERC has consistently ensured that open access to transmission service is provided on both a short-term basis (e.g. day ahead and real time) as well as on a longer-term basis (e.g. monthly and yearly).

Outside of organized markets, transmission providers have complied with the requirements of open access and comparability by filing open access transmission tariffs (“OATT”) setting out the terms and conditions for obtaining transmission service and establishing an orderly process by which any customer can reserve and schedule transmission capacity, subject only to the physical constraints and limitations of the grid. Under the OATT framework, every transmission customer has the same opportunity to manage its exposure to transmission congestion by requesting and reserving short-term and long-term firm point-to-point transmission service. When customers’ schedules exceed the capability of a given path, customers that reserved firm service have scheduling priority over customers that reserved non-firm service. In this manner, transmission customers committing to firm service are able to secure physical transmission service, and hence to hedge their exposure to the risk of congestion across the desired path and for the desired duration. In turn, this transmission service commitment supports customers’ entering into forward transactions for energy delivered to or from desired locations, including regional trading hubs, which promotes liquidity and market efficiency.

² See, e.g., *Regional Transmission Organizations*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089 at 30,993 (2000) (“In . . . Order Nos. 888 and 889, the Commission established the foundation necessary to develop competitive bulk power markets in the United States: non-discriminatory open access transmission services by public utilities . . .”).

In CAISO and other RTO/ISO markets that manage transmission congestion through the use of locational marginal pricing (“LMP”), however, transmission customers experience congestion risk in a different way. Rather than facing a risk that physical transmission service will be unavailable, customers in an LMP market face a financial risk in the form of LMP congestion charges. For customers to hedge the financial risk associated with congestion in LMP-based markets on a forward basis, these markets have created financial transmission rights (“FTR”)—referred to as CRRs in CAISO—which entitle the holder of the financial rights to certain revenues based upon the difference in the congestion component of LMP over a defined point of receipt and point of delivery in the day-ahead market. A customer that holds a CRR between two locations is thereby “shielded” on a forward basis from congestion charges associated with its physical day-ahead use of the grid between those two same locations.

Like firm transmission rights under the OATT framework, CRRs are critically important to the efficient functioning of wholesale markets and have the potential to confer significant benefits on market participants. The primary purpose of CRRs is to allow entities delivering or receiving physical power to hedge the risks that congestion will cause day-ahead prices at the physical delivery location (e.g., the generator bus for internal resources, intertie scheduling points for external system resources, and load aggregation points for demand) to differ from the price at the location specified by the forward contract (which is most typically, a financial trading hub such as NP-15 or SP-15). In other words, FTRs in LMP-based markets serve the same function as firm physical transmission rights under the OATT framework – they allow both suppliers and purchasers to hedge congestion risk on a forward basis, supporting efficient forward transacting. This was affirmed by FERC in a recent order, where FERC acknowledged that “FTRs were designed to serve as the financial equivalent of firm transmission service and play a key role in ensuring open access to firm transmission service by providing a congestion hedging function.”³

Powerex strongly urges CAISO to recognize the important role CRRs play in ensuring open and non-discriminatory access to the CAISO transmission grid and in supporting the efficient functioning of forward energy markets, consistent with FERC policy.

B. CRRs Promote Efficient Market Operation

It is well-established that efficient wholesale energy markets support transactions over a range of timeframes, including long-term and near-term forward contracts as well as CAISO’s organized day-ahead and real-time markets. The key purpose of forward contracts for a generator or importer is to obtain certainty regarding the price it will receive for its future output. Similarly, one of the key purposes of a forward contract for a load-serving entity (“LSE”) is to obtain certainty regarding the price it will pay for its future consumption.

³ *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,093 at P 27 (2017).

Critically, forward financial contracts only can provide the price certainty desired by the parties to an agreement if the contract location matches the location where the physical generation or consumption will be settled; a contract at any other location creates exposure to day-ahead congestion, which undermines the core benefit of forward contracting: price certainty. For example, if a seller enters into a forward financial contract at a trading hub, but settles its physical deliveries at a generator bus location in the CAISO's day-ahead market, it is exposed to day-ahead congestion risk between the generator bus and the trading hub. CRRs are the critical instrument that enables a buyer with load at one location to enter into a contract with a seller with a resource at a different location, and still achieve fixed price certainty for both parties over the duration of the contract.

Forward contracting will be most efficient when it occurs at market locations with multiple sellers and multiple buyers. This offers the greatest opportunity for buyers to find supply options that best meet their needs, and vice versa. In the CAISO grid, there are two such liquid forward trading locations—NP15 and SP15—where forward contracts are available for a range of durations and delivery profiles. Achieving price certainty through a forward contract at a trading hub, however, effectively requires two CRRs: first, a CRR to hedge the congestion price risk between the supplier's location and the trading hub, and a second CRR to hedge the congestion price risk between the trading hub and the location of the buyer's load. Such forward contracting is possible today, since any eligible market participant can participate in the CRR auctions to obtain the specific CRRs to meet their needs.

Because the availability of CRRs is central to facilitating efficient forward contracting, a framework that unnecessarily limits CRR availability can create substantial adverse consequences. For instance, if CRRs were only available to a select type of market participant, such as LSEs, the ability to enter into forward contracts at liquid trading hubs would be greatly diminished, or disappear altogether. Effectively, an LSE would need to request and receive CRRs for the full path from the supply resource's location to the location of the LSE's load. A supplier would lose the ability to transact with multiple different potential buyers, such as currently occurs at a trading hub, and instead would be forced to sell to the one (or few) LSEs that had received the CRRs with a source point at the supplier's location. Just as it would be problematic for the CRR design to limit LSEs' ability to access multiple competing suppliers, it is also problematic for the CRR design to limit suppliers' ability to transact with multiple competing purchasers.

There is a second adverse consequence of limiting CRR availability only to LSEs (or to any other single type of participant): it effectively makes the CRR holder the intermediary between physical supply resources and the CAISO. For instance, if only LSEs could obtain CRRs from intertie scheduling points to load locations, external suppliers would no longer be able to obtain forward price certainty by entering into forward financial contracts at NP15 and SP15, since doing so would expose the seller to ongoing day-ahead congestion risk between the intertie scheduling point (e.g., Malin)

and the trading hub for the duration of the forward financial contract. To avoid this risk and obtain forward price certainty, an owner or marketer for resources outside the CAISO would need to enter into a forward contract with an LSE at its specific intertie delivery location, where such contracts are typically physical delivery contracts rather than financial contracts.⁴ Critically, however, forward physical delivery contracts do not typically give the purchaser (*i.e.*, the California LSE, in this example) rights to dispatch the output of a generating facility, but rather specify a fixed quantity of energy to be delivered during specific hours of the day. In other words, forward physical contracting between California LSEs and external suppliers generally results in day-ahead self-schedules by LSEs of energy imports at CAISO interties as standard multi-hour blocks during each applicable day of the forward physical contract. By making CRRs available to all entities, the current CRR framework permits external suppliers to enter into *financial* forward contracts at California trading hubs to attain desired price certainty, while retaining the flexibility to submit economic offers (rather than self-schedules) into the CAISO's day-ahead and real-time market, and adjust their physical supply volumes according to CAISO market awards.

For the reasons discussed above, Powerex believes that ensuring all market participants have an equal opportunity to obtain CRRs provides important operational and market efficiency benefits to the CAISO market, and, ultimately, to its customers. In particular, Powerex recommends that CAISO specifically assess the extent to which enhancements to the design of CRRs, the CRR auction, and the CRR allocation process could help reduce self-scheduling and promote economic bidding.

II. Analyzing the Efficiency of the CRR Market

Powerex believes that any analysis of the efficiency and performance of the CRR auction must be based on a complete picture of the benefits of CRRs in an organized market. While Powerex agrees that CRR revenue inadequacy and the aggregate ongoing returns of auctioned CRRs are valuable indicators of the efficiency and financial performance of the CRR markets, these measures alone are insufficient to fully evaluate the benefits and costs of the existing CRR design.

In particular, simply comparing the aggregate CRR auction revenues received by LSEs to the aggregate CRR payments funded by LSEs misses critical aspects and benefits of CRRs. Namely, an LSE may derive important economic benefits from being able to enter into forward contracts for a portion of its load. As discussed in the prior section, such forward contracts provide the LSE with price certainty for a portion of its load, instead of facing the day-ahead market price—including both congestion and energy. Powerex therefore urges CAISO to explicitly recognize the role of CRRs as instruments that facilitate forward contracting in the CAISO grid, and that provide benefits to the

⁴ In addition to generally using physical rather than financial contracts, the forward markets at intertie locations such as COB or NOB are considerably less liquid than at NP15 and SP15.

parties that enter into those contracts, including LSEs. In addition, Powerex urges CAISO to recognize that CRRs obtained by suppliers can also have a unique and positive impact on markets by supporting economic bidding from external resources under forward contracts (as opposed to self-scheduled supply, which would likely be the result if CRRs were made available only to LSEs). Both of these are important benefits of making CRRs widely available in the market, and should be incorporated into any analysis of the benefits or performance of the existing CRR framework.

In addition to expanding the conceptual framework of the analysis of CRR performance as described above, Powerex agrees that CAISO and stakeholders would benefit from additional information about the factors causing persistent CRR revenue inadequacy and low aggregate CRR auction returns. The following sections focus on the nature of these inefficiencies and potential ways of analyzing these issues.

A. CRR Revenue Inadequacy

In recent years, the CRR framework has resulted in persistent CRR revenue inadequacy, which refers to the difference between day-ahead congestion rents collected by CAISO and the CRR settlements that must be paid by CAISO to CRR holders. As noted at the April 18th Working Group, the payments made to CRR holders exceeded the net congestion revenues received through the day-ahead market by approximately \$23 million in Q2 of 2016.⁵ Currently, the costs of CRR revenue inadequacy are recovered through uplift to LSEs based on measured demand, thereby effectively making these customers the financial guarantors of CRR revenues.

In theory, if the model used for the CRR auction's simultaneous feasibility test ("SFT") were fully consistent with the day-ahead market model, congestion rents collected in each day-ahead market interval would be sufficient to fully fund all CRRs distributed through the CRR auction and allocation process. In practice, however, there are differences between the CRR SFT model and day-ahead market model due to various factors, including de-rates, topology changes, differences in modeling assumptions, differences in the granularity of the two market processes, and modeling errors. Where such differences occur, the result can be a shortfall between the money owed to CRR holders and the congestion rents collected through the day-ahead market.⁶

Powerex believes that the critical first step towards tackling CRR revenue inadequacy is clearly identifying the underlying causes responsible for differences between the CRR

⁵ CAISO, CRR Auction Efficiency Analysis Working Group at 6 (Apr. 18, 2017) ("CAISO Working Group Presentation"), *available at* <http://www.aiso.com/Documents/Presentation-CongestionRevenueRightsMarketWorkingGroupMeeting.pdf>.

⁶ The CRR allocation and auction process employs a global de-rate such that the total CRRs issued are deliberately less than the maximum simultaneously feasible amount. But the day-ahead market conditions can differ from the SFT assumptions to lead to revenue inadequacy despite this global de-rate.

SFT and the day-ahead market models, and the relative contribution of each of these causes to revenue inadequacy. Powerex believes that a useful way of approaching this issue would be to break-down CRR revenue inadequacy by constraint and by cause. Powerex suggests that the category of causes include physical transmission de-rates, transmission topology changes, modeling errors, as well as a residual category of other causes.

B. CRR Auction Returns

While much of the early discussion of the shortcomings of the CRR auction has focused on the issue of CRR revenue inadequacy, increasingly discussions of CRR market performance have focused on systemic differences between CRR auction proceeds and the payouts made to CRR holders. In particular, there is evidence that many CRRs are sold in the auction at prices that are below—and sometimes far below—the value of the payments those CRRs eventually receive. As noted at the April 18th Working Group, the shortfall between CRR auction proceeds and payments to auctioned CRRs in Q2 2016 was approximately \$19 million.⁷

Assessment of CRR auction performance is challenging, as the relevant comparison is between CRR auction proceeds and the CRR payouts *expected at the time of the auction*. Expectations, of course, cannot be directly measured, and after-the-fact outcomes may differ significantly from what was expected. However, this does not mean that a comparison between CRR auction revenues and actual CRR payouts is not meaningful. But it does mean that any analysis of price convergence needs to span a sufficiently long period in order to identify persistent patterns. As Dr. Harvey observed at the February 3, 2017 Market Surveillance Committee Meeting, “[i]n light of the unpredictable variability of congestion charges, comparisons of past auction revenues and day-ahead market payouts need to be carried over a sufficiently long period of time to allow valid conclusions to be drawn regarding the underlying relationship, given the historic variability in auction prices and day-ahead market payouts.”⁸

For that reason, Powerex believes that any analysis of CRR auction revenues and payouts should be based on a review of data for at least a five-year period. In particular, Powerex recommends that CAISO calculate the return on capital received by CRR auction participants over five years, broken out by different types of market participants (e.g., LSEs, physical participants, and financial participants). Very high returns (after properly accounting for other factors including the riskiness of the investment and direct costs associated with holding CRRs) may indicate a lack of liquidity or participation on certain paths in the CRR auction. It may be beneficial to

⁷ CAISO Working Group Presentation at 6.

⁸ CRR Prices and Payouts: Are CRR Auctions Valuing CRRs as Hedges or as Risky Financial Instruments, Briefing on Analyzing Congestion Revenue Rights at 11 (Feb. 3, 2017).

examine the return on capital based on potential factors such as type of market participant and temporal auction market (*i.e.*, for CRRs acquired in an annual rather than monthly auction, as the former can imply expectations considerably farther in advance than the latter).

Powerex also believes that it would be useful to evaluate the net returns on CRR auction holdings on a constraint-by-constraint basis. Dr. Harvey outlined how returns on CRR auction holdings could be de-composed into returns on the associated constraints. The returns on each constraint could then be further associated with the number of bidders seeking to purchase CRRs, or the number of different entities successfully obtaining CRRs, that have a significant shift factor to the respective constraint. This would help identify whether it is CRR constraints with relatively low auction competition that are driving high auction returns. Additionally, the auction return on each constraint may be highly dependent on the frequency that the constraint is materially de-rated in the day-ahead market. In other words, high returns may not be a function of especially low auction prices, but of frequent and significant day-ahead de-rates that lead to high day-ahead congestion charges, relative to auction clearing prices.