



Comments of Pacific Gas & Electric Company

System Market Power Analysis

Submitted by	Company	Date Submitted
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Pacific Gas and Electric Company (PG&E) offers the following comments on the California Independent System Operator’s (CAISO) System Market Power Analysis Report. PG&E believes the report highlights the need for the CAISO to start a stakeholder process that holistically considers the how to measure market power along with the appropriate mitigation procedures at the system level.

PG&E’s comments can be summarized as follows:

1. CAISO should expand the scope this effort into a stakeholder initiative that focuses on developing system market power mitigation measures, given that their report shows a significant number of non-competitive hours in 2018 and that market power conditions are likely to get worse in the near future.
2. A comprehensive analysis on market power needs to include cost impacts. PG&E estimates that the total excess market rents across CAISO during top system implied heat rate hours were \$145 million in 2017 and \$82 million in 2018.
3. Simple mitigation measures, such as imposing a Default Energy Bid plus 50-100% adder in a wide number of hours when market power is identified would be easy to implement, substantially mitigate the effects of system market power, and still allow resources to reflect costs in bids.
4. The presumption that the market is structurally competitive should be rejected. PG&E disagrees with CAISO’s chosen RSI scenario and offers specific recommendations on how the supply and demand stack should be calculated. Regardless, the range of results based on CAISO’s various supply and demand stack assumptions is sufficient to demonstrates a lack of structural competitiveness.
5. CAISO’s recommended actions for LSEs to hedge doesn’t remove the need for effective system market power mitigation

PG&E’s comments include an appendix providing specific feedback on the CAISO’s RSI calculation and potential improvements to better reflect the potential for market power.

1. CAISO should expand the scope this effort into a stakeholder initiative that focuses on developing system market power mitigation measures, given that their report shows a significant number of non-competitive hours in 2018 and that market power conditions are likely to get worse in the near future.

CAISO’s RSI analysis showed that a significant number of hours failed the tests for structural competitiveness under a range of scenarios. Thus, it is reasonable to conclude that structural

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system market power frequently exists. Moreover, the market conditions that contribute to a tightening system, such as less gas generation and more generation controlled by net sellers, is likely to continue or worsen in the coming years¹.

Thus, CAISO should move forward with a stakeholder initiative focused on developing proper system market power mitigation measures. CAISO should not wait for market conditions to worsen at the expense of ratepayers. Rather, it should proactively put forth measures to detect and mitigate the adverse impacts of the exercise of market power. PG&E believes the analysis illustrates the lack of structural competitiveness required for the CAISO market to ensure just and reasonable rates.

2. A comprehensive analysis on market power needs to include cost impacts. PG&E estimates that the total excess market rents across CAISO during top system implied heat rate hours were \$145 million in 2017 and \$82 million in 2018.

PG&E appreciates CAISO's analysis, but we believe a crucial component of the analysis is missing. Traditional measures of market power include both the structural competitiveness as measured by metrics similar to the RSI, but also the price impact to ascertain the cost impact from the exercise of market power. The CAISO has provided analysis that is necessary for an understanding of the competitiveness of its market, but not sufficient given the lack of analysis on the cost impact.

In order to provide a rough estimate of the excess rent extracted due to market power, PG&E isolated the hours with undispached thermal capacity² and elevated heat rates³ during 2017 and 2018. PG&E then recalculated the system marginal energy component using a heat rate of 20 MMBTU/MWh and multiplied the price difference by the day ahead cleared load. Total excess market rents of \$145 million in 2017 and \$82 million in 2018.

Year	Weighted Avg Price (\$/MWh)	Heat Rate (MMBTU/MWh)	Load (MWh)	Competitive Price (\$/MWh)	Excess Rent (\$M)	Number of Hours
2017	\$230	33.28	1,651,646	\$142	\$145	42
2018	\$570	25.75	676,269	\$449	\$82	15

We recognize that our estimate is rough but the results (if nothing else) demonstrate the potential customer costs impact that can occur from market power. PG&E urges CAISO and the Department of Market Monitoring to provide a more complete impact analysis on the price cost mark up and impact on total customer costs so that stakeholders can better understand the historical magnitude

¹ [Memo on Department of Market Monitoring's 2018 Annual Report](#) (May 10,2019)

² PG&E isolated the days with thermal generation less than 25,000 MW. A portion of the undispached thermal capacity could be due to real-time market prices being much lower than day ahead market prices but without data on the total awarded energy and offered quantity, PG&E is left with the actual generation data provided by the CAISO public website.

³ PG&E defines elevated heat rate as implied system market heat rates above 20 MMBTU/MWh during 2017 and 2018. PG&E uses the System Marginal Energy Component and the higher of the SoCalGas Citygate versus PG&E Citygate natural gas price along with the GHG index price when calculating implied system heat rates.

of the issue. The Department of Market Monitoring (DMM) should also provide such analysis on an ongoing basis when market implied heat rates are high.

3. Simple mitigation measures, such as imposing a Default Energy Bid plus 50-100% adder in a wide number of hours when market power is identified would be easy to implement, substantially mitigate the effects of system market power, and still allow resources to reflect costs in bids.

PG&E understands that there are many ways to approach system market power mitigation and it is appropriate to go through a stakeholder initiative to more fully consider the cost and benefit of different mitigation measures. However, PG&E believes that even a simple measure—such as such as putting a Default Energy Bid plus 50-100% adder in a wide number of hours when market power is possible—would be a good starting point for discussion and would allow resources to reflect their marginal costs in their bids in all hours. PG&E recommends the CAISO quickly implement a simple measure and to iterate and refine it, if necessary.

4. The presumption that the market is structurally competitive should be rejected. PG&E disagrees with CAISO’s chosen RSI scenario and offers specific recommendations on how the supply and demand stack should be calculated. Regardless, the range of results based on CAISO’s various supply and demand stack assumptions is sufficient to demonstrates a lack of structural competitiveness.

CAISO’s analysis showed a wide range of results depending on how the supply and demand inputs are calculated. In a number of those scenarios, a significant number of hours failed the test for structural competitiveness. PG&E disagrees with CAISO’s assertion that its chosen scenario (where supply is calculated via input bids + virtual supply – net buyer and demand is determined by using DA forecast) is the one that most accurately reflect system conditions. PG&E provides specific feedback on how that calculation should be modified in the appendix. Regardless, given that many of the scenarios indicated that the market was structurally non-competitive in a significant number of hours during the year, it is not appropriate for CAISO to conclude the market is structurally competitive.

5. CAISO's recommended actions for LSEs to hedge doesn't remove the need for effective system market power mitigation.

The CAISO makes various policy recommendations that reflect an understanding of California’s retail energy landscape that no longer exists. In May of 2017, staff from the California Public Utilities Commission published a white paper citing estimates that “over 85% of retail load [would be] served by sources other than IOUs by the middle of the 2020s.”⁴

In an environment where load is fractured amongst multiple Load Serving Entities (LSE), simple recommendations that LSE “hedge” or “bid defensively” quickly run into collective action problems that did not exist five to ten years ago when most of the demand was served by three

⁴ See Consumer and Retail Choice, the Role of the Utility, and an Evolving Regulatory Framework, https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Retail%20Choice%20White%20Paper%205%208%2017.pdf accessed May 17, 2019.

Investor Owned Utilities regulated by the CPUC. CAISO has a responsibility to respond to this changing energy landscape by mitigating market failures, such as the exercise of market power, which create inefficient pricing and unjust rates for retail consumers in California.

Not All Forward Hedges Mitigate Against Seller Market Power.

PG&E is concerned with CAISO's recommendation because market outcomes (and the effectiveness of the mitigation measures) can have a direct effect on the prices of the hedges. All forward hedges are not created equal in terms of mitigating the incentives for generators to increase their energy bids above their marginal costs. A range of financial products are available to hedge price exposure of LSEs without entering into traditional long-term tolling agreements⁵. Long-term tolling agreements where Load Serving Entities take on the scheduling coordinator role for generators and provide capacity payments as were common when the majority of load in California was served by the three Investor Owned Utilities (IOUs), effectively mitigated against the exercise of market power.

However, load shift from IOUs to smaller Community Choice Aggregators (CCAs) has complicated forward contracting practices and introduced significant uncertainty for hedging through traditional tolling arrangements. The large number of LSEs now engaged in forward procurement likely creates additional problems as large generators now need to enter into multiple contracts with multiple LSEs, creating a collective action problem. Furthermore, LSEs in a competitive structure have less ability and fewer incentives to sign long-term deals.

These contracting complications highlight the need for effective market power mitigation at the CAISO level to ensure market prices and bilateral hedges are just and reasonable. As more and more tolling contracts expire with the traditional IOUs in the coming years, the CAISO must put into place effective system market power mitigation.

Increasing the volume of price-responsive demand involves additional price risks.

The CAISO recommends LSEs use the volume of price-responsive demand in the Integrated Forward Market to combat the exercise of seller market power. LSEs should evaluate the relative costs of serving customer loads in the day-ahead versus the real-time markets, but this is not a risk-free proposition. Real-time markets are generally more volatile than the Day-Ahead market and could be sensitive to increases in demand. Additionally, the price demand response resources can have a material effect on how effective supply is in mitigating market power.

As with suggestions for forward contracting, a much more straightforward remedy to the exercise of market power would be to have the CAISO create a balanced screen for the presence of market power and mitigate bids when detected.

⁵ Forward energy hedging can include purchasing a fixed-priced, forward power contract, more complex financial options/swaps, cross-commodity hedges such as heat rate options typically engaged in by financial institutions, and/or including price level guarantees in scheduling coordinator contracts with third parties. Many of these products provide the LSE with price certainty, hedging the financial exposure to higher market prices, but do not provide remove the incentive for generators to exercise market power.

Appendix 1: Discussion on why the CAISO’s recommended RSI Calculation underestimates market power

Traditional measures to identify markets with the potential for market power (such as HHI, RSI, and Delivered Price Test) focus on overall structural competitiveness of the market and the amount of competitive supply alternatives. The key purpose of the measures is to identify market conditions where suppliers would have the ability and incentive to exercise market power. While the RSI is one tool to measure market power, it can overstate the amount of competitive supply available if all capacity is included regardless of price. For example, if the CAISO had 10,000 MWh of virtual, import, and demand response supply bid into its market at \$2,000/MWh, an RSI or HHI measurement could falsely show that the market is structurally competitive. Such \$2,000 bids would make no material impact in ensuring the market is structurally competitive at normal energy price levels.

As such, PG&E believes the following assumptions would be a better reflection of market power in an RSI calculation and demonstrate CAISO’s recommended option underestimates market power. PG&E is not necessarily asking for additional analysis but believes the following demonstrates the concern is greater than CAISO estimated and further justifies our position that CAISO should immediately move to develop mitigation methods.

Supply

Physical Bids: exclude bids above \$750 because they do not reflect competitive supply options in most hours⁶.

Virtual Supply: use net cleared virtuals because virtual bids at high price levels and which don’t clear are not helpful to market competitiveness. Net cleared virtuals best reflect the expectation of additional supplies (e.g. from EIM and renewables in real time)

Use an average number between input and output bids: it is better to use the average of input versus output bids because input bids ignore any inter-temporal ramping limitations that may limit the amount of supply that can affordably be dispatched during ramp. On the other hand, output bids understate the offered quantity, but reflects the optimization’s schedule for ramping energy, etc. It is most appropriate to use a number between those two to more accurately reflect actual system conditions.

Demand

We believe it is reasonable to use either the DA Forecast or Actual Demand. Using the forecast in the DA market is a common data point that should inform the position market participants take when creating their supply bids. Using the actual metered demand controls for all forecast errors in the day ahead market process.

PG&E recognizes the subjective nature of these criteria selection and recommends the CAISO begin a stakeholder process to weigh these tradeoffs against one another to create a workable, dynamic measure to detect market power and effectively mitigate this market flaw.

⁶ DMM study on increased imports at or near cap