Pacific Gas and Electric Company

Comments of Pacific Gas & Electric Company

Resource Adequacy Enhancements – Second Revised Straw Proposal

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 Corporation's (CAISO) Resource Adequacy (RA) Enhancements – Second Revised Straw Proposal, published October 3, 2019, and discussed in the stakeholder meeting on October 9th.

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

1. PG&E supports the use of a single counting method for both system and local RA.
2. PG&E requests the CAISO discuss how the absence of a must-offer requirement in real-time i) might impact direct and uplift costs and ii) fits with the CAISO's proposal to only mitigate system market power in the real-time market. PG&E opposes the CAISO's proposal regarding bid insertion.
3. PG&E supports several of the CAISO's proposals to planned outage treatment, but still believes Planned Outage Process Enhancements should be moved into its own initiative for focused development and expedited implementation.
4. PG&E supports the CAISO's adoption of provisions similar to CPUC Import RA rules but highlights apparent divergence in real-time treatment.
5. PG&E asks that the CAISO explain the fundamental shift in its conception of the flexibility problem, the objectives of the flexibility product, and its product design.

1. <u>PG&E supports the use of a single counting method for both system and local RA.</u>

PG&E appreciates the CAISO's efforts to establish a single counting method for both system and local RA. While PG&E remains open to that single counting method being Unforced Capacity (UCAP), we do not believe that the argument for UCAP over Net Qualifying Capacity (NQC) has gained strength in the second revised straw proposal. Two aspects we would highlight are limited progress in 1) the development of a UCAP approach for the many availability-limited resources largely driving the need for RA reform, and 2) the development of UCAP for local RA.

PG&E also appreciates the CAISO outlining its principles and objectives in the second revised straw proposal but asks how the principle that 'Load Serving Entities' (LSEs) RA resources must be capable

of meeting its load requirements all hours of the year' is consistent with the admission that the CAISO cannot assess individual LSE load profiles in relation to their share of a collective deficiency.[1]

System RA Counting

While UCAP may be regarded as an industry best practice, employed by several Regional Transmission Operators / Independent System Operators (RTOs/ISOs), it appears to better fit what are essentially fuel-unrestricted generation resources (*e.g.*, natural gas and coal). PG&E asks that the CAISO explain how UCAP is a better approach than the existing mechanisms to assess the heterogenous and growing fleet of availability-limited resources in California. We also note that given California's environmental goals, gas plants will likely be retiring in the future. As plants approach retirement, UCAP reduces the incentive for resources to perform maintenance and be available.

PG&E suggests the CAISO also develop options for revisions to the RA Availability Incentive Mechanism (RAAIM) that provide a more simplified and targeted incentive mechanism when the CAISO really needs the energy (or ramp) in order to maintain reliability. The current RAAIM mechanism likely provides too low an incentive to perform during emergency conditions but creates unneeded complexity and costs in other hours.

Local RA Counting

PG&E believes that the current proposal to utilize UCAP for local RA will result in redundant capacity procurement and unnecessary costs without a clear reliability benefit. Local Capacity Technical (LCT) studies determine the minimum generation capacity needed to satisfy local reliability requirements. The CAISO does this by performing a series of simulations to identify the most critical contingencies within each local area and by modeling the 1-in-10 summer peak load for those local areas. The simulations performed include generator contingency outages and, in some instances, these same outages are the most severe contingency that establish the local requirement. The local capacity requirements will not change by using NQC values or converted UCAP equivalents. The proposal to convert an NQC requirement into a UCAP equivalent value will apply an unnecessary outage rate for resources that count towards a local requirement that already accounts for generator outages. Additionally, the CAISO notes in its proposal that using a 1-in-10-year forecast should cover all foreseeable procurement needs. If the UCAP objective is to account for load forecast error and operating reserves, then the existing load modeling assumptions for LCT studies should adequately meet this expectation. The CAISO's current proposal will not change the local capacity requirement and the UCAP conversion may result in a reduction of the resources that count towards the requirement without a demonstrable reliability benefit. Local procurement requirements established on this basis will result in unnecessary costs and will diverge from the Transmission Planning Process that utilizes NQC to approve transmission capacity.

PG&E asks that the CAISO demonstrate the impact of the proposed approach to the various local area requirements, including any local deficiencies that arise.

[1] CAISO's RA Enhancements – Second Revised Straw Proposal, http://www.caiso.com/Documents/SecondRevisedStrawProposal-ResourceAdequacyEnhancements.pdf, 31.

Coordination with the California Public Utilities Commission (CPUC)

PG&E would also like to take the opportunity to reiterate from its previous set of comments that the CAISO should make the case to the CPUC and other Local Regulatory Authorities that UCAP should be the basis of reliability planning. If unable to do so successfully – perhaps in part because of issues with applying UCAP to local, as discussed in the previous section –, the CAISO should keep and modify the existing NQC method and/or adjust the Planning Reserve Margin.[2]

2. PG&E requests the CAISO discuss how the absence of a must-offer requirement in real-time i) might impact direct and uplift costs and ii) fits with the CAISO's proposal to only mitigate system market power in the real-time market. PG&E opposes the CAISO's proposal regarding bid insertion.

PG&E acknowledges that the CAISO sees the proposal for a day ahead-only (DA) must-offer obligation (MOO) as a partial concession to PG&E's request that MOOs align with operational capabilities. PG&E concedes that a DA-only MOO does reduce administrative burden for a resource scheduling coordinator. However, PG&E's position that the CAISO move away from a 24 by 7 MOO is grounded in the fact that resources may not be able to participate in all hours of the day due to operational constraints. The proposal to transition to a 24 by 7 DA-only MOO does not address this concern. Instead, it merely reduces the times, from two to one, resources are asked to offer capacity in a manner potentially inconsistent with their operational capabilities.

PG&E asks how the CAISO's stated principle that 'the RA framework should reflect the evolving needs of the grid' is consistent with a proposal that insists on a 24 by 7 MOO.

Potential Increase in Direct and Uplift Costs

PG&E questions whether – instead of correcting the misalignment between MOO and resource capability – the proposal could aggravate the problem of uplift costs. Conceptually, freeing capacity that has been paid for from offering in the real-time (RT), for hours that it can reasonably be expected to be available to address the changes between the DA market and RT markets, could result in increased redispatch and uplift costs. PG&E asks whether the tradeoffs justify the alteration and requests analysis that demonstrates, if possible, that such a change will not aggravate uplift costs.

The CAISO often produces significant changes in the cost of dispatch for a given day between DA and RT. Sometimes the associated costs are directly assigned, such as to generation outages, Variable Energy Resource deviations from forecast and under-forecasted load. Other times, redispatch costs are borne indirectly in uplift costs such as Real-Time Congestion Offset (RTCO), as is the case for transmission derates or other modeling discrepancies. RTCO alone has averaged ~$80M a year since

[2] Please see PG&E's comments at http://www.caiso.com/Documents/PGEComments-ResourceAdequacyEnhancements-RevisedStrawProposal.pdf, 1.

2010, with the 2018 value reaching $117M. PG&E asks what impact the CAISO would anticipate the proposal might have on the figures in Table 1.[3]

Year	RT Energy Imbalance Offset Costs ($MM)	RT Congestion Imbalance Offset Costs ($MM)	Total Imbalance Offset Costs ($MM)	Source[4]
2010	$79	$23	$102	Footnote 4.A
2011	$137	$28	$165	Footnote 4.A
2012	$50	$186	$236	Footnote 4.A
2013	$64	$126	$190	Footnote 4.A
2014	$109	$107	$217	Footnote 4.B
2015	$15	$50	$65	Footnote 4.B
2016	$5	$51	$61	Footnote 4.C
2017	$49	$38	$82	Footnote 4.C
2018	$14	$117	$128	Footnote 4.C

Table 1: RT dispatch differences from DA have resulted in high uplift costs charges.

Market Power Mitigation and DA Market Enhancements

PG&E notes that the CAISO is proposing to have system market power mitigation (MPM) apply only in RT. We request the CAISO explain how that MPM is effective without a RT MOO for all RA resources. PG&E understands the CAISO believes that the Imbalance Reserve Capacity (IRC) in DA Market Enhancements (DAME) will eliminate the need for a RT MOO. PG&E believes that the IRC is directed towards different objectives. Please see Point 5 below for additional discussion.

Bid Insertion

PG&E opposes bid insertion for all non-use limited resources and resources registered as use-limited and instead recommends treating un-bid or self-scheduled capacity as a forced outage for the purposes of UCAP. PG&E is concerned about changes to bid insertion given the CAISO has not adequately addressed the shortcomings of its opportunity cost calculator (OCC) model for use-limited resources.

[3] From the CAISO Department of Market Monitoring 2018 Annual Report on Market Issues and Performance: "Real-time congestion imbalance offset charges increased from $38 million in 2017 to $117 million in 2018. In 2018, persistent and significant constraint limit reductions in the 15-minute market across most of the binding 15-minute market hours for binding constraints appears to have caused the majority of the real-time congestion imbalance charges." http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf, 80-81.

[4] A) *2012 Annual Report on Market Issues & Performance*, Department of Market Monitoring, http://www.caiso.com/Documents/2012AnnualReport-MarketIssue-Performance.pdf;
B) *2015 Annual Report on Market Issues & Performance*, Department of Market Monitoring, http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf;
C) *2018 Annual Report on Market Issues & Performance*, Department of Market Monitoring, http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf.

The CAISO has operated in fits and starts in applying the OCC model to resources more complicated than thermal generators with a defined start limitation. The current OCC model is a rough approximation of many (largely hydroelectric) use-limited resources. These assets fit the criteria for use-limitation status but have complex operational limitations that the CAISO has not fully incorporated into its OCC model. The CAISO should significantly overhaul its OCC model to include all operational limitations associated with these assets before it considers subjecting all resources to bid insertion.

However, without a commitment to this overhaul, PG&E recommends the CAISO proceed with treating intervals without bids or self-schedules as forced outages for the purposes of UCAP. This will have the effect of lowering the operational capacity of these resources reflecting historical bidding patterns. This should also be done in concert with work the CAISO has committed to undertaking with the CPUC in defining a durable counting methodology for hydroelectric resources.

3. PG&E supports several of the CAISO's proposals regarding planned outage treatment, but still believes Planned Outage Process Enhancements should be moved into its own initiative for focused development and expedited implementation.

PG&E acknowledges that CAISO has suggested a phased implementation of items within the RA Enhancements initiative, including implementing Planned Outage Process Enhancements in 2021 for RA 2022. Nevertheless, PG&E reiterates from its previous comments that it recommends that the Planned Outage Process Enhancement be removed and taken up in its own stakeholder initiative for earlier implementation.[5]

However, PG&E is supportive of the direction the CAISO is taking with its proposed Planned, Opportunity, and Forced Outage categories. The new Planned Outage design promises to afford scheduling coordinators who submit outages in the ≥ T-45 timeframe far greater certainty, with outages being denied solely on the basis of a failure in the CAISO's existing reliability check.

PG&E also supports the proposal to allow internal resources to be shown for a subset of the RA month, similar to import RA resources. This alteration enables the new treatment of Planned Outages, as these resources can be withheld from being shown for RA for the days on which they are on outage. It also allows for an honest and accurate representation in monthly RA showings of the capacity that can actually be relied upon. This aligns with the following stated principle in PG&E's previous set of comments: Reflect physical reality – the reliability need and resource capability.[6]

With respect to Opportunity Outages, the CAISO proposes that the resource requesting the outage may provide substitute capacity to resolve any RA deficiency, but that if the provided substitute capacity causes the reliability check to fail, the CAISO will reject the outage on the original RA resource. The CAISO offers to provide a bulletin board service to Scheduling Coordinators to aid in their search for

[5] Please see PG&E's comments at http://www.caiso.com/Documents/PGEComments-ResourceAdequacyEnhancements-RevisedStrawProposal.pdf, 4.
[6] Ibid., 1.

adequate capacity. While the CAISO has moved away from its strict substitute capacity "comparability" requirements, proposed in the straw proposal,[7] PG&E reiterates from its previous comments that the CAISO should use the Competitive Solicitation Process (CSP) to procure adequate substitute capacity, then give LSEs the option to either pay the CSP price, find alternative capacity, or cancel the outage.[8]

4. PG&E supports the CAISO's adoption of provisions similar to CPUC Import RA rules but highlights apparent divergence in real-time treatment.

PG&E is broadly supportive of the CAISO's stated intention to adopt provisions similar to current CPUC RA program rules and regulations for RA imports. However, PG&E notes that the CAISO's proposed DA-only MOO for Import RA appears to diverge from the CPUC's requirement that non-resource-specific RA imports shall self-schedule into the CAISO's markets.[9]

We also note that the CAISO proposes to require RA imports to specify the source Balancing Area (BA) to ensure all RA import resources are fully available and dedicated to the CAISO for reliability. We note that the DMM provided analysis of other RTOs/ISOs methods to ensure the importing resource is dedicated to the importing RTO and are not recallable if there is a need in the source BA. PG&E requests the CAISO provide additional explanation on how having a source BA specified ensures importing resources are dedicated to the CAISO for reliability.

5. PG&E asks that the CAISO explain the fundamental shift in its conception of the flexibility problem, the objectives of the flexibility product, and its product design.

PG&E reiterates from its previous comments that it recommends the CAISO defer development of new flexible RA counting rules, requirements, sufficiency tests.[10]

However, PG&E notes the sea change in objective and design of flexible RA. After years of stressing the challenges of the duck curve and the imperative of assuring forward and operational access to adequate 3-hr flexible capacity to address net-load ramps, the CAISO appears to have entirely abandoned the net-load ramp problem for a granularity and forecast error problem. It may be that for a variety of reasons this significant change is entirely appropriate. However, PG&E believes the argumentation for such a change in the second revised straw proposal was incomplete.

In the second revised straw proposal, the CAISO states that it observes the need for two categories of flexible capacity:

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[7] The CAISO's RA Enhancements – Revised Straw Proposal, http://www.caiso.com/Documents/RevisedStrawProposal-ResourceAdequacyEnhancements.pdf, 36.
[8] Please see PG&E's comments at http://www.caiso.com/Documents/PGEComments-ResourceAdequacyEnhancements-RevisedStrawProposal.pdf, 4.
[9] California Public Utilities Commission Rulemaking 17-09-020, *Decision D1910021 - Decision Affirming Resource Adequacy Import Rules*, dated October 17, 2019.
[10] Please see PG&E's comments at http://www.caiso.com/Documents/PGEComments-ResourceAdequacyEnhancements-RevisedStrawProposal.pdf, 6.

1) Predictable: known and/or reasonably forecastable ramping needs, and
2) Unpredictable: ramping needs caused by load following and forecast error.

It further states that these two types of flexible capacity needs drive different forms of flexible requirements.

The CAISO states that to meet the predictable ramping needs, it needs a set of resources available to the CAISO's DA market to properly shape the DA market to meet forecastable ramps and to create a feasible market dispatch in the DA market. The CAISO then states that it will no longer pursue flexible RA capacity to address predictable ramping needs across hours in the DA market. It states that it will rely on the DA market to commit and schedule resources to meet the forecast ramp. The CAISO gives no reason why it expects sufficient rampable capacity to be offered into the DA market so that it can commit and schedule resources to meet the predictable ramping requirements in DA market. This may well be likely, but more discussion on why a requirement that was deemed so necessary before is no longer needed would be useful.[11] The ability to commit such resources depends entirely on the market mechanisms the CAISO will use to identify the need and price the capacity service. The CAISO should demonstrate the operation of this DA capacity product will be up to the task.

PG&E asks how the CAISO's stated principle that 'RA counting rules should *promote procurement* of resources' is consistent with the proposal of a new, *operationally*-focused flexible RA product.

Further, and quite surprisingly, the CAISO states in the proposal and in the presentation that it relies on LSEs to consider the net-load ramp in their procurement activities. A clear LSE-specific forward requirement for capacity directed at this problem would appear to make more sense than relying on the uncoordinated activities of a growing pool of LSEs. It could well be that there is so much flexibility on the system that concern regarding the duck curve has ebbed and it makes sense to pivot and redirect a redesigned flexible RA towards other objectives. This would be understandable; but again, the argument was incomplete.

The CAISO then proposes to develop a RA flexible capacity product that will ensure that participants offer sufficient flexible capacity into the DA market to address uncertainty that can arise between the DA and RT markets. In DAME, the CAISO is working on developing an Imbalance Reserve Product that it can schedule in the DA market to ensure that it schedules sufficient flexible capacity to address uncertainty that can arise between the DA and RT markets. This capacity will address uncertainty that can arise between the DA energy requirements in a given hour and the RT energy requirements in that same hour. This capacity is not designed to be deployed to meet random changes that can occur across multiple hours. Enough rampable IRC will be held aside in a given hour to ensure that CAISO can deploy the IRC to meet uncertainty between the Integrated Forward Market (IFM) schedule in that hour and the Fifteen-Minute Market (FMM) forecasts in that hour. The proposed DAME formulation may use the same rampable capacity for IRC in multiple hours since DAME does not consider deployments of IRC that can build across multiple hours. If IRC must be deployed in a given hour to meet a random change in energy requirements between the IFM and FMM, the IRC scheduled in

[11] The CAISO's RA Enhancements – Revised Straw Proposal, http://www.caiso.com/Documents/RevisedStrawProposal-ResourceAdequacyEnhancements.pdf, 56-8.

subsequent hours may no longer be available to meet any additional random changes that build on top of the change in the given hour. The CAISO would have to redispatch in the RT markets to recover the ramping capacity it needs to meet such future additional uncertainty.[12] As such, setting the flexible RA capacity requirement to allow the IFM to schedule IRC to meet uncertainty between DA and FMM may not provide the capacity to meet forecast ramping needs across multiple hours.

PG&E would appreciate further discussion by the CAISO of the reasons why CAISO believes that it is appropriate to set RA requirements to meet unpredictable ramping needs between the DA and RT markets while RA requirements to meet predictable ramping needs across hours in the DA market are not needed. This is not to say that this decision is inappropriate; just a request for further discussion of reasons behind the CAISO's decision.

Establishing Flexible RA Counting Rules: Effective Flexible Capacity Values and Eligibility

PG&E recommends the CAISO calculate the Effective Flexible Capacity (EFC) for solar resources based on the largest range a resource can move over a 15-minute interval the same as other resources but cap the bidding obligation (and associated penalties for non-compliance) at the hourly forecasted amount. This will effectively require all solar, wind, and other variable resources that provide the CAISO a forecast and are shown as flexible capacity to provide bids up to their forecasted output.

Flexible RA Must Offer Obligation Modifications

PG&E supports simplifications for the flexible RA bidding requirements and suggests that renewable resources that can submit economic bids should also be able to provide flexible capacity and be subject to the same requirements as any other resource.

PG&E understands that under the proposal EFC values would be based on resources' ramp rates. Renewable resources should likewise be eligible for an EFC value equivalent to their ability to curtail over the same period. Given the successful implementation of these changes, renewable resources should be subject to the same bidding requirements when shown as flexible capacity as another other resource: that they bid up to their filed EFC quantity from 5:00 AM to 9:00 PM, but the bidding requirement is capped based on the hourly forecast.

[12] It is not clear that rampable capacity will be available to support this redispatch without a Real-Time MOO.