Energy Division Staff Proposals Regarding Resource Adequacy (RA) Program Refinements

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Table of Contents

1. Qualifying Capacity Calculations for Intermittent Resources

A. Summary

The Commission adopted a methodology manual in Decision (D.)09-06-028 that codified the calculation of qualifying capacity (QC) for different types of generating resources as they count towards CPUC-imposed resource adequacy (RA) obligations.[1] The adopted QC Calculation Manual lays out the method to calculate the QC for dispatchable and non-dispatchable generators.

While staff will ultimately propose a new, effective load carrying capacity (ELCC) methodology for wind and solar resources, three aspects of the currently adopted methodologies for these and other non-dispatchable resources, as described in the QC Calculation Manual, are cause for concern in the near term. Staff recommends that revisions be considered now, in parallel to the development of a more permanent ELCC methodology for wind and solar resources, because the current methodologies for non-dispatchable resources could result in outcomes that are potentially inconsistent with the overall purpose of QC calculations.

First, grouping of solar photovoltaic (PV) and solar thermal in one category when using the exceedance methodology masks the real differences in the performance and generation profiles of these two distinct types of solar generators, resulting in QC values that do not accurately represent the differing contributions of these two technology types towards meeting RA needs.

Second, the inclusion of test data (MWh of actual energy production observed before a generator becomes commercially operable) in QC calculations yields a QC value reflecting a distorted performance history that is based on partial operation of a facility and fails to realistically represent the contribution of facilities towards meeting RA needs.

Third, the use of proxy data instead of historical data for hours when a facility is impacted by outage, which is intended to avoid double penalties for generators also subject to performance penalties from the California Independent System Operator (CAISO), sometimes results in elimination of a large part of the performance history of facilities. Moreover, these facilities may only be slightly or insignificantly impacted by outage; in such cases, staff must discard extensive usable data.

To address these issues, Energy Division staff recommends that the QC values for solar thermal and photovoltaic resources be calculated separately, that test data be excluded from QC calculations, and that the use of proxy data in QC calculations be reduced or eliminated in some instances. The following sections provide additional details regarding these three proposals.

B. Differentiation between PV and Solar Thermal Generators for QC Calculations

Background

Energy Division calculates QC values for wind and solar generating units using the exceedance methodology. Staff uses three years of operating history, or in the absence of performance history (for

[1] http://www.cpuc.ca.gov/PUC/energy/Procurement/RA/ra_compliance_materials.htm

new units) the QC values are set equal to technology-specific performance factors ("technology factors"). Historically, solar facilities have been grouped together to create one set of technology factors, regardless of whether the facilities were PV or solar thermal facilities. However, these facilities operate very differently, due to different technological characteristics.

The distinction between PV and solar thermal generators in performance patterns was not as apparent or significant when there were very few PV generators; in the past, most of the capacity attributed to solar generators was from large solar thermal facilities located near Kramer Junction. At that time, there were very few solar facilities receiving QC values, and the solar technology factors were skewed by the large contribution of the Kramer area solar thermal facilities. The capacity of RA-eligible solar PV in California has increased significantly since 2012 due to the renewable portfolio standard (RPS) program, however, and the state now has similar quantities of PV and solar thermal capacity.

Proposal

Due to the growth of both PV and solar thermal generation in California in general and the CAISO in particular, it is now more important to accurately assess the reliability contribution of solar facilities and to reflect differences in performance in facility QC values. As new facilities are built, it is also important to ensure that developer incentives are aligned with reliability impacts. Therefore, Energy Division proposes to revise the QC Calculation Manual to direct Energy Division to calculate two sets of technology factors for solar facilities: one set specifically for solar thermal facilities and the other for PV facilities. At this time, Energy Division does not propose to create separate factors for tracking or fixed solar PV generation; however, it does plan to address this technology difference in its ELCC proposal.

C. Use of Test Data for QC Determination

Background

A generating resource often comes online in stages, testing individual units (within one resource ID) with the CAISO, before finally reaching Commercially Operation for Delivery (COD) status. Additionally, facilities (particularly intermittent renewable resources) sometimes reach commercial operation in piecemeal fashion, receiving Commercially Operational for Markets (COM) status for each block of the resource that comes online. Moreover, all facilities go through a period of testing wherein they are generating electricity as dispatched by the CAISO, and being paid for that energy, before the facility officially certifies as available for commercial operation.

During the testing period, facilities are often testing a portion of the facility's generating capacity, or operating at less than maximum capacity. Often a facility is ramping up and down to test the metering and telemetry, or is running only the most recently installed capacity, and this generation is often not delivered during peak hours. For facilities that certify for commercial operation in multiple phases, it is difficult to differentiate between the portion of the facility that is operating commercially and the portion of that same facility that is in testing. The energy generated during that time is called test energy, and may not be indicative of what the facility can be expected to generate when it is fully commercial.

Energy Division receives Actual Settlement Quality Meter Data (hereafter simply referred to as meter data) from the CAISO and uses these data to calculate the QC of intermittent facilities; the QCs of wind and solar facilities are calculated with the exceedance methodology, while the QCs of other intermittent facilities are based on a three-year rolling average of performance during peak hours. In the absence of meter data (i.e., for new facilities that do not yet have meter data), Energy Division assigns a facility a QC calculated from technology-specific averages, which draws from the entire pool of generating facilities that are commercially operational. The QC for a particular facility is meant to reflect the expected generation or reliability contribution of the facility in the upcoming compliance year; however, it is unclear whether test data serves that purpose.

This issue, always present, became much more prevalent this year as significant numbers of new intermittent facilities reached commercial operation. Figure 1 illustrates the increase in Exceedance Nameplate capacity for wind and solar facilities since 2011.[2] The discontinuity between December of 2012 and January 2013 is partially explained by the addition to the dataset of additional facilities that already existed but were not previously provided by the CAISO to the CPUC for inclusion in the dataset; nevertheless, the majority of the increase between December 2012 and January 2013 is attributable to installation of new capacity. An even larger increase will be seen between December 2013 and January 2014.

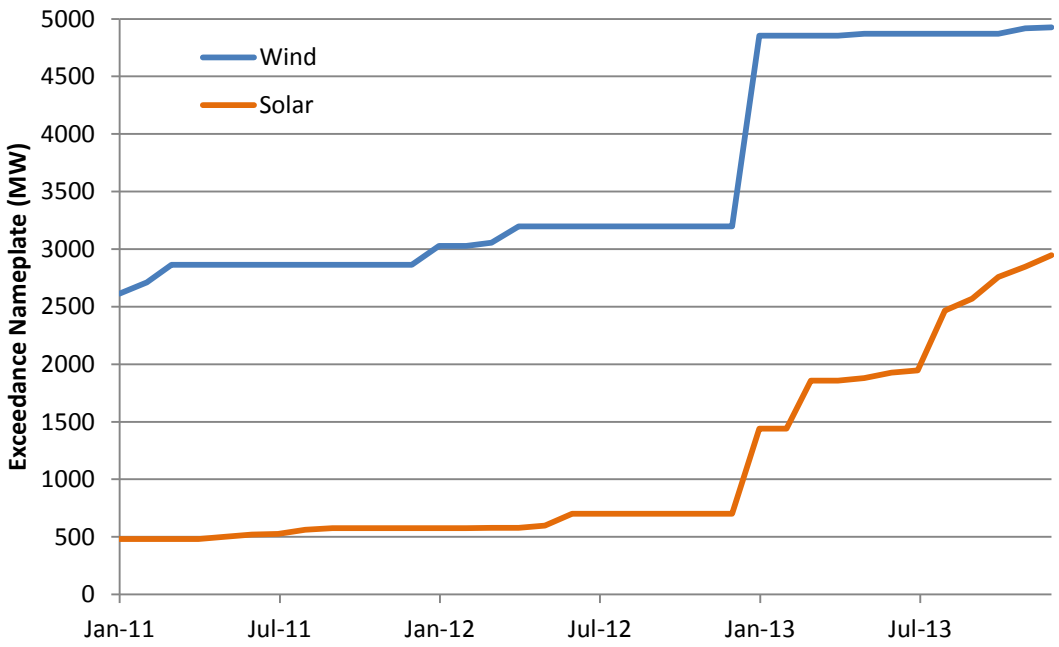


Figure 1. RA-eligible Wind and Solar Capacities, 2011-2013

[2] Exceedance Nameplate is calculated according to directions in the QC Calculation Manual, and is the sum of the individual Exceedance Nameplates of all Solar and Wind facilities in the CAISO meter data dataset for the particular months and years shown.

In calculating the QC of wind and solar facilities for the 2015 RA compliance year, Energy Division staff excluded test data from the QC calculations for wind and solar facilities and, instead, replaced test data with the technology factors up until the month the facility achieved commercial operation. While staff found nothing specifically in the adopted QC Calculation Manual that provided direction for the handling of test data, Staff decided to exclude the test data because it was consistent with the overall intent of the QC Calculation Manual, which is to realistically reflect the reliable RA capacity that could be achieved from particular facilities.

Proposal

Energy Division proposes to amend the QC Calculation Manual to explicitly exclude test data from the calculation of QC values, to only use meter data beginning on the date the facility reaches commercial operation, and to calculate QC based on the technology factors up until that point. For generators that come online in stages, and reach commercial operation a portion at a time, when calculating QC values staff will only utilize historical meter data beginning on the date that the entire facility (all stages) has reached commercial operation.

D. Use of Proxy Data for Hours Impacted by Outage

Background

The RA program attempts to avoid double-penalizing generating facilities that experience forced or planned outages. Because the CAISO can levy a financial penalty when facilities undergo forced or planned generator outages, it is not necessary to further penalize facilities for outages by reducing their QCs. Instead, the QC Calculation Manual directs Energy Division to assign each facility a QC value that reflects expected performance in the absence of such forced or planned outages. Because non-dispatchable resources receive QC values based on three years of historical generation data (sourced from CAISO actual settlement quality meter data), the generation values utilized must be filtered or modified to eliminate the effects of outages.

Pursuant to the direction of the adopted QC Calculation Manual, staff uses CAISO outage data to identify hours in the prior three years in which a particular facility was impacted by generator forced or planned outages; this analysis includes partial outages, or hours in which the facility continued to operate, but energy output was reduced.[3] Staff then develops proxy performance data for those hours by calculating the average generation in the corresponding hour of the other two years of facility operation, as recorded in the CAISO meter data. Once proxy data have been developed, staff modifies its historical generation dataset for the facility (the three years of CAISO meter data), replacing the performance in outage-impacted hours with the proxy values.

In implementing this rule, however, staff found that it is not always the case that outages reduce the performance of a facility, or that meter data from other years would be a better proxy to insert. This is due to how the outage management systems are used by generator owners. Generator owners use the outage management systems to log outages for a number of different causes, making it very difficult to

[3] Staff downloads CAISO outage data from either the Scheduling and Logging for the ISO of California (SLIC) application, or the new Outage Management System (OMS).

distinguish between outage events, or to determine either the cause or the timing of a single outage event.

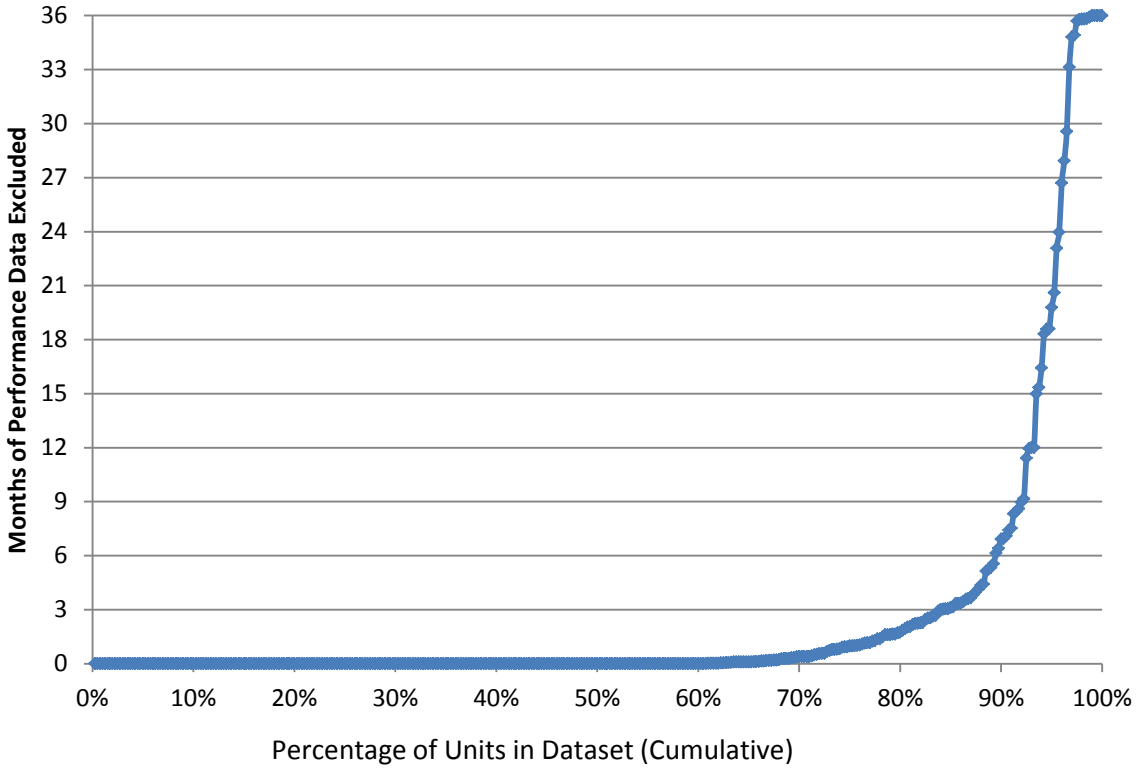
Moreover, many outage events do not derate a generator at all. For example, some forced outages affect only metering or communication equipment, and do not reduce energy output. Staff does not find it reasonable to exclude performance data when there is little to no actual reduction in energy output.

Use of proxy values is particularly problematic for facilities with outages that persist for long periods of time. Several facilities have logged outages with durations of several months or even years. In such cases, a facility could be left with only one or two years of performance history from which to calculate the QC value, and the facility will lose the benefit of diversity that existed within the original, three-year dataset. Volatility associated with such a small dataset can lead to inaccurate or overly sensitive QC calculations, which confuse and complicate contracting around RA obligations. For example, the QC calculation for a facility with extensive proxy values may be overly sensitive to specific weather patterns or economic activity; such facilities may actually be penalized by excluding data that would balance out fluctuations. Nevertheless, the QC Calculation Manual directs staff to remove outage hours from the dataset regardless of the impact on the QC of the facility. This potential for facilities to receive lower QC values (i.e., to be penalized) as a result of the use of proxy data runs contrary to the stated purpose of utilizing these proxy values, which is to avoid double-penalizing facilities for outages.

Figure 2 below illustrates how much performance data is excluded for individual facilities because of the current treatment of outages. There are 400 intermittent facilities included in the figure below, all of which have at least one year of performance data. About 10 percent of the facilities have data excluded for over 6 months, or half a year (1/6 of a facility's three-year dataset) and a few facilities in the cluster of observations at the far upper right (about 2 percent of all facilities in the dataset) have the full three years of data excluded (36 months). The QC Calculation Manual does not provide a remedy for this situation.

Over the past 3-5 years, staff has devised workarounds where the QC is calculated both with and without outage data and the most reasonable outcome is used to determine the QC. In the event the QC of a particular facility is overly erratic, fluctuates disproportionately, or is lower upon removal of meter data due to outages, staff does not exclude outage data from the dataset and instead calculates QC from the full range of CAISO meter data. Staff has attempted to calculate the QC of a facility in keeping with the overall purpose of the process, ensuring that facilities are not double-penalized for outages (first by CAISO performance penalties and second by a lower QC). Through the workaround described above, staff has sought to ensure that QC values are stable, and as much as possible reflect the expected performance of the facility in the next RA compliance year.

Figure 2. Months of Data Excluded Due to Outages



Proposal

Energy Division proposes to amend the QC Calculation Manual to create a mechanism to manage the situation illustrated on the right hand side of Figure 2. Energy Division proposes two options, and parties are encouraged to comment on these proposals or to submit their own, with as much concrete analysis as possible, in order to help the Commission determine the best course of action.

Option 1: Energy Division proposes to eliminate the entire section of the QC Calculation Manual that details downloading and processing of generator outage data, and instead to calculate QC for intermittent facilities using the entire dataset regardless of the generator's outage history.

Option 2: As an alternative, Energy Division proposes to set a threshold at which staff would no longer exclude performance data potentially impacted by outage. Energy Division proposes a threshold of six months; if a facility is impacted by an outage for more than six months during the three years of performance in the dataset, Energy Division will use the entire dataset without consideration of outage history. If the facility is impacted by outage for six months or less, then Energy Division will follow the direction of the QC Calculation Manual and generate proxy data from the other performance data in the dataset.

2. Avoided Transmission and Distribution Line Losses for Demand Response Resources in the RA Proceeding

A. Background

In D.09-06-028, the Commission directed that the qualifying capacity (QC) of demand response (DR) resources be based on the Load Impact Protocols (LIPs) adopted in D.08-04-050.[4] In D.10-06-036, the Commission further determined that the QC values for DR resources should be "grossed-up" for avoided line losses because the DR resources are supplied at the customer meter level and, therefore, eliminate the need to account for transmission and distribution (T&D) line losses. The QC Manual directs Energy Division staff to calculate the avoided line losses using a 3% transmission loss rate and a distribution loss rate "from the most recent available data submitted in each IOUs current or previous general rate case."[5]

Energy Division staff has identified a number of problems with the current approach. First, the avoided line loss values are often located in confidential workpapers in General Rate Case application proceedings. Energy Division staff has had difficulty locating these workpapers, and the line loss figures contained within them, and has also had difficulty determining whether the line losses figures in the workpapers are cumulative or separable, since they are often presented in spreadsheet format without clear documentation. Second, Energy Division staff has determined that the line loss figures currently used to gross-up DR resources in the RA proceeding are not the same as those currently used in the Long-Term Planning Proceeding (LTPP) or the CAISO's Transmission Planning Process (TPP), and there is no clear reason for this discrepancy.

B. Proposal

To ensure consistency with LTPP planning assumptions, reduce administrative burden for Energy Division staff, and provide greater transparency to parties, Energy Division proposes to use the avoided line loss factors from the mostly recently adopted LTPP Assumptions & Scenarios (A&S) to develop QC values for DR resources. The currently adopted LTPP A&S values are shown in Table 1, below.[6]

Table 1. LTPP Transmission and Distribution Loss Assumptions

	PG&E	SCE	SDG&E
Peak, distribution losses only	1.067	1.051	1.071
Peak, transmission and distribution losses	1.097	1.076	1.096

[4] The LIPs are detailed in Appendix A to D.08-04-050, found at http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/81979.PDF.
[5] 2011, Adopted QC methodology manual, found at http://www.cpuc.ca.gov/PUC/energy/Procurement/RA/ra_compliance_materials.htm.
[6] See Assigned Commissioner's Ruling Technical Updates to Planning Assumptions and Scenarios for Use in the 2014 Long Term Procurement Plan and 2014-2015 CAISO TPP, Attachment at p. 15, found at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M091/K181/91181771.PDF.

For purposes of “grossing-up” QC values for DR resources to account for avoided line losses in the RA process, Energy Division staff proposes to use the LTPP Assumptions & Scenarios adopted and available at the time Energy Division staff allocates DR QC values for the next RA compliance year; this allocation process usually occurs in the summer prior to each RA compliance year.