
**COMMENTS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
ON COUNTING WIND RESOURCES FOR RESOURCE ADEQUACY
Docket R.08-01-025**

In its comments on the Energy Division's draft 2007 Resource Adequacy (RA) Report, the CAISO stated an intent to evaluate the various methodologies proposed in the 2007 RA Report for modifying the calculation of Qualifying Capacity (QC) for wind resources and, if appropriate, propose an alternative methodology. Based on this further evaluation, the CAISO now offers an additional proposal for counting wind resources. The CAISO's proposal is designed to stimulate further dialogue regarding the refinements to the calculation of capacity from wind resources needed to achieve better alignment between RA program rules and the fundamental RA policy objective of enhancing system reliability.

Consistent with the underlying objective of improving and ensuring system reliability, the CAISO's proposal rests on two key principles. These principles should generally guide the selection of any revisions to the Commission's QC methodology for wind (and solar)¹ resources:

- The QCs determined for RA resources should provide the CAISO with a high level of assurance that enough RA capacity is available to meet peak demand. Thus, the methodology for assessing the QC of wind and solar

¹ Although the CAISO has assessed data relating only to wind resources for purposes of this proposal, the CAISO's general methodology also applies to solar resources.

resources should account for the performance of such resources during the appropriate peak demand periods.

- The QC methodology must be scalable to accommodate the expected increase in capacity from wind resources. In other words, the methodology must be capable of adjustment to produce greater confidence in predicting actual production as the quantity of installed capacity from wind resources becomes a more significant proportion of California's overall generating capacity.

In its 2007 RA Report, the Energy Division provided data demonstrating that the current methodology for determining wind resources' QC (three year historical average of hourly production during Standard Offer 1 ("SO1") peak hours) is insufficient. The data confirmed both the high degree of variability in the output of wind resources and that the current QC values frequently overstate production, and often in a significant quantity or percentage basis, during the peak load hours. The 2007 RA Report also offered several methods for revising the current counting protocols for wind resources, but these options did not fully satisfy the foregoing principles. However, the CAISO's proposal builds from concepts included in the 2007 RA Report options and combines them in a manner that the CAISO believes better meets the grid reliability requirements.

As California increasingly relies on wind resources to meet energy production needs, it becomes even more critical that the QC counting rules used for these intermittent resources accurately reflect the available capacity during the peak load hours. The CAISO believes it is essential that the Commission implement a new methodology to determine the QC of wind resources. The current methodology should be changed to better reflect the ability of wind resources to support reliable operation of the grid during

peak load. Provided below is the CAISO’s proposal for changing the QC counting rules for wind resources to meet the goal of reliable grid operations during peak load periods

Proposed Methodology

The CAISO proposes to increase the reliability of QC assessments for wind resources by relying on historic deliveries of energy from intermittent generation during operational peak hours. In this regard, the relevant generation deliveries for assessing the QC should be limited to the three peak load days in a month, and the three peak load hours of each of the three peak load days in that month. Similar to today’s counting methodology, the CAISO’s proposal uses a three-year average of this data to create each month’s QC. In essence, the CAISO is proposing to use a “rule of threes”: three peaks hours of each day, three peak days of each month, and three years of data. The proposal does not, however, involve a change in the process in establishing QC in that resource owners would continue to be responsible for their own RA calculations (and verified by CEC).

In addition, the CAISO proposes that the QC percentages for new wind resources be determined on a “wind zone” basis until it has sufficient historic data. Thus, until the particular resource has sufficient historic production data, the amount of capacity that a new wind resource can be counted for RA purposes would be determined for each of the following five² major wind generation geographic areas within California:

- San Gorgonio
- Tehachapi
- Altamont

² The wind generation data for the San Diego area was not readily available during the drafting of this proposal, but the CAISO anticipates including such data in further analyses and is open to adding this area to the methodology.

- Solano, and
- Pacheco Pass.

A percentage value would be determined for each of the five wind geographic areas within California that would be applied to all new Resource IDs within each area to determine the MW amount that each new Resource ID will be allowed to count toward in RAR showings. The value would be calculated for each month of the year.

The following load and generation data would be used to perform the analysis:

1. The previous three years of wind generation energy production data for each wind resource and, if a new wind resource, for each of the five wind geographic areas within California.
2. The calculation would be based on data for each of the 12 months of each year, and include the peak hour of each day plus the previous hour and the hour subsequent to the peak hour.

Using the data above, the following would be determined for each resource and the five wind geographic areas within California:

1. The three peak system load days for each month.
2. The actual wind generation energy production by resource or wind geographic area, as applicable, for each of the three peak load days in each month (actual energy production during the three peak load hours of each day).
3. The percentage of actual energy produced compared to the installed nameplate capacity rating on the wind generation facility or facilities in each of the wind geographic areas, as applicable, as shown in the CAISO generator Master File that is published on the CAISO web site at:

<http://www.caiso.com/14d4/14d4c4ff59780.html>

The resulting “percentage value” for a particular wind resource or wind geographic area would then be applied to that existing wind resource with sufficient historic data or new resource within a wind geographic area to establish a QC value for each wind generating facility (an QC would be established for each Resource ID). The NQC values would then be published on the CAISO website.

As the CAISO reviewed the data derived using the above methodology it was recognized that basing the QC on average actual generation, even in the peak hours, may introduce a bias into the result that affects operational reliability. For example, consider a peak hour in which the output of a 100MW generator varies between 5% and 25% of its rated capability with an average of 15%. Using the average value would generate a QC of 15MW and create a situation whereby during a peak load hour the CAISO would be expecting access to 15MW of capacity but only have 5MW to serve load. This would require the CAISO to acquire an additional 10MW during real-time operations of the system that was not procured through forward RA contracts. Hence, it may be appropriate to augment or revise the average measure with a statistical measure of the distribution of levels of output over the peak hour along with a reliability-based confidence threshold. To the extent that output is relatively even over the peak hour, such a measure would converge to the average, but if it is not, such a measure, depending on how it is specified, would provide some degree of correction in the QC that supports system reliability. CAISO believes that a modification to this proposal to include such measures should be reviewed. Provided below in Table 1 are the initial results of the CAISO proposal using production data from 2005, 2006 and 2007 and the methodology described above.

Preliminary Results

Provided below in Table 1 is a comparison of the 2007 QC as a percent of nameplate capacity based on the methodology currently approved by the Commission,³ and the QC that would result from this CAISO proposal based on actual wind generation energy production data for calendar years 2005, 2006 and 2007.⁴

Table 1
Comparison of Current QC to QC that would result from this CAISO Proposal
(%)

Area	QC Capacity as a Percent of Installed Nameplate Capacity											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
San Geronio (Current)	13.68	20.05	30.73	39.50	41.26	41.74	28.03	21.88	23.99	19.63	17.84	17.05
San Geronio (Proposed)	15.17	15.91	22.62	12.46	19.09	11.83	12.38	7.21	4.08	5.75	2.64	9.86
Tehachapi (Current)	24.07	32.17	44.35	57.78	58.61	57.09	33.03	27.38	32.52	29.74	28.77	28.47
Tehachapi (Proposed)	15.99	21.33	26.89	18.17	15.35	8.77	11.89	12.81	9.29	4.17	18.11	11.43
Altamont (Current)	2.17	4.29	10.41	13.21	22.48	30.64	21.12	16.83	15.71	10.18	3.19	2.54
Altamont (Proposed)	4.31	6.49	4.19	3.82	12.94	5.44	10.88	6.63	11.46	4.18	4.20	2.33
Pacheco Pass (Current)	2.97	6.71	11.82	19.37	28.18	43.96	31.07	24.95	21.48	10.55	4.83	2.92
Pacheco Pass (Proposed)	1.75	12.53	6.63	1.12	13.26	10.84	15.78	6.05	13.6	5.74	0.37	3.92
Solano (Current)	0.43	1.45	5.27	7.03	12.86	20.56	20.07	14.07	12.06	6.69	2.11	1.23
Solano (Proposed)	5.21	16.49	11.73	9.42	29.25	16.79	25.12	13.01	26.74	9.32	12.98	3.39
San Diego (Current)	8.02	13.77	24.53	38.11	36.99	36.28	23.46	16.32	20.17	16.00	11.78	10.39
San Diego (Proposed) ⁵												

³ The information in Table 1 is underlying data for “Figure 5. 2007 QC as a Percent of Nameplate Capacity,” page 22 of Energy Division 2007 RA Report.

⁴ Each Resource ID within each wind generation geographic area would have the percentage shown in Table 1 applied against its installed nameplate capacity rating to determine the MW value that could be contracted for by a LSE and counted towards fulfillment of its Resource Adequacy Requirement.

⁵ The CAISO did not calculate a proposed percent for this area, but is open to adding this area to the methodology.

The data used to perform this analysis came from the CAISO's Plant Information ("PI") system, which records the wind generation energy production data. The data is for the calendar years of 2005, 2006 and 2007. The data used was for the three peak load days in each month, which may not be consecutive days of the month. The peaks hours turned out to be the same for the years 2005, 2006 and 2007. The peak hours were as shown in the table below.

Month	Three Peak Hours
January	17:00, 18:00, 19:00
February	17:00, 18:00, 19:00
March	18:00, 19:00, 20:00
April	14:00, 15:00, 16:00
May	14:00, 15:00, 16:00
June	14:00, 15:00, 16:00
July	14:00, 15:00, 16:00
August	14:00, 15:00, 16:00
September	14:00, 15:00, 16:00
October	15:00, 16:00, 17:00
November	17:00, 18:00, 19:00
December	17:00, 18:00, 19:00

Conclusion

The CAISO recognizes the contributions that wind resources provide in serving load within California, but as stated in several decisions by the Commission, “a key purpose of our RAR is to ensure that resources are made available to the CAISO when and where they are needed.”⁶ The above CAISO proposal focuses on the “when needed” aspect of RA resources and proposes a methodology that determines available QC in a manner consistent with when the CAISO needs the capacity, during the peak load. The CAISO looks forward to working with Commission staff and stakeholders to further discuss this proposal as well as other options to address the concerns regarding QC for wind resources.

Respectfully submitted,

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⁶ CPUC Decision 05-10-042, page 15 as found at:
http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/50731.htm