

**BEFORE THE ENERGY COMMISSION
OF THE STATE OF CALIFORNIA**

In the Matter of:

Implementation of the Renewable)
Portfolio Legislation and)
Renewable Investment Plan)
Legislation)

Docket No – 03-RPS-1078
and 02-REN-1038

**COMMENTS OF PACIFIC GAS AND ELECTRIC ON THE
CALIFORNIA RENEWABLES PORTFOLIO STANDARD
INTEGRATION COST ANALYSIS – PHASE I AND
WORKSHOP DISCUSSION, PHASE I: FINDINGS AND RESULTS
OF COSTS OF INTEGRATING RENEWABLES**

Pacific Gas and Electric (PG&E) again welcomes and appreciates the opportunity to comment on the Methods Group’s Phase I report discussing renewable generation integration costs in the California Independent System Operator’s (CAISO) control area. PG&E understands that the comments on the California RPS Phase I report are part of an ongoing process to accurately assess and refine the integration costs associated with various renewable generating technologies. These comments are intended to facilitate this process either in Phase I of the study or as part of the subsequent Phase II analysis.

PG&E appreciates the three phase structure initiated by the CEC. This structure will allow interim values for integration to be in place with the conclusion of Phase I which can be utilized by retail sellers in their respective bid ranking evaluations. This helps avoid possible delay on the achievement of the many milestones which are needed to

develop a solid, comprehensive ranking structure for renewable bids. PG&E encourages the Methods Group to take the time needed in order to give full consideration to the alternative methodologies proposed by stakeholder groups in order to ensure that the study results provide the most robust and representative values possible for the costs of integration and effective load carrying capacity. Having a chance to study, review and refine these numbers in Phase II and Phase III means that accurate values will be available for the long run as they will be based on a solid foundation.

PG&E's goal is to continue to help shape and improve the study results. Towards that end PG&E offers the following comments for consideration.

Study Approach

PG&E noted in its comments submitted on October 23, 2003, that other contemporary integration cost studies identified integration costs much more significant than that reported in the Methods Group's California Renewable Portfolio Standard (RPS) Phase I Integration study. Specific studies and study results were offered as a basis for comparison. PG&E suggested that the Methods Group review these studies and offer a discussion of how the methodology and results differ from the Phase I analysis.

The Methods Group has offered a brief, qualitative statement regarding each alternative study and why the study results may differ from the conclusions of the Phase I analysis. The response noted that only one of the five studies investigated offered comparable integration costs results. The Methods Group concluded the integration cost differences associated with the other four studies can be attributed to forecasting error. While helpful, this level of investigation represents only a conceptual assessment as to why study results do not corroborate the Methods Group's conclusions and falls short of the quantitative analysis required to verify the assessment offered.

PG&E would like to encourage the Methods Group to further investigate these studies in order to identify both common conclusions and the factors that may cause the study

results to diverge from the conclusions of the California RPS Phase I study. This should include a more detailed assessment of the underlying market conditions, available data, study methodology, and conclusions. The Methods Group should strive to quantitatively replicate and confirm the conclusions of the Phase I study through the methods used by the alternative studies. Alternatively, the Methods Group could attempt to isolate or remove the elements of these studies that it identifies as not relevant to the California RPS Phase I study. Ideally, the remaining integration costs could then serve to corroborate the California RPS Phase I study results.

Capacity Credit

At the California Energy Commission's (CEC) Renewables Committee Workshop on February 20th, Southern California Edison (SCE) presented an alternative study approach for the calculation of the Effective Load Carrying Capacity (ELCC) of wind turbine generating technology. The ELCC value for wind technology from this study was significantly lower than the results from the California RPS Phase I integration cost study. SCE and their consultant offered that the different conclusions could be attributable to a number of reasons including; alternative calculation methodologies, data differences, base year differences, or other possible factors.

Due to the magnitude of difference between the two studies and the importance of determining a fair and representative ELCC for each renewable technology, PG&E recommends and supports a collaborative effort by the principal consultants and other interested parties to reconcile the conclusions reached by the two reports. Again, the ultimate goal of such an effort should be to reach consensus on the ELCC value for each technology even if the value results from differing study methodologies. If this isn't feasible, the Methods Group should offer a detailed assessment of why: 1) the study results differ from those presented by SCE, and 2) the California RPS Phase I study results are still valid.

PG&E also supports the investigation and development of alternative and simplifying methodologies to calculate the capacity credit for renewable generating technologies that

are more replicable, transparent, and can be readily updated to reflect additional data and the changing market conditions expected as new renewable resources are procured, renewable market penetration increases, and additional operating data becomes available. This may be best addressed in Phase II of the integration cost study.

The simplifying methodology should support the recalculation of the Capacity Credit analysis on an annual basis and be updated by a California regulatory agency such as the CEC with support from their technical staff. Any updated calculation of the ELCC should be presented in a workshop or hearing forum similar to the process utilized for the current RPS implementation so that stakeholder groups have ample time for public review and comments before there is a final approval for use in subsequent procurement solicitation.

Regulation

The regulation analysis methodology utilizes class aggregate data to determine a total “system” regulation cost that is then re-allocated across the class energy to reach a cost on a \$/MWh basis for each specific renewable generating technology. For wind generation technology, the generation data is likely to be primarily attributable to existing, unit-sized wind turbine technology. These turbines, their operating characteristics, and potentially their regulation impacts may not be representative of the same characteristics of the class of wind turbines likely to be developed in response to any forthcoming renewable procurement solicitations. In addition, the California RPS Phase I study methodology explicitly assumes that the integration costs of an incremental addition of renewable generation (energy) is equivalent to the integration costs associated with the existing aggregate generation.

From this methodology, it would seem that the true integration costs of any renewable generation is not simply the average unit integration cost of the installed class (\$/MWh) applied to the new increment of energy to be generated, but it is instead the change in the average integration costs of the installed class (after the addition of the incremental project) times the new total energy (MWh) produced by the installed class. If the

incremental addition of the new generating technology does not change the class average cost then the current methodology and results would be valid. If the class average integration costs increase or decrease then the current methodology may not accurately capture the true incremental integration costs.

PG&E recommends that the Methods Group review the study results utilizing this “incremental,” approach to confirm if the existing methodology, utilizing a “class average”, truly captures the full integration costs of an incremental addition of wind turbine capacity (and all other technologies). This review should include exploring methodologies that calculate integration costs from representative data associated with modern wind turbine technology and do so on an incremental (project) basis instead of a class basis. The analysis should specifically address whether the incremental addition of an advanced technology wind farm has significantly different regulation requirements and costs than the class aggregate. Should the results be different than the Phase I results, this may then warrant a discussion and decision on whether the class aggregate or incremental approach best represents the integration costs of an incremental capacity addition of renewable generation technology.

Load Following

The California RPS Phase I integration cost study concluded the load following impacts of various renewable generating technologies are small when compared to the bias introduced by the scheduling coordinators in the scheduling process. It further noted there were no significant cost impacts at the current level of market penetration. These conclusions were based on data and the recorded schedule bias in 2002.

It would be useful to investigate whether the schedule bias of scheduling coordinators has changed from the levels seen in 2002 or is it projected to change in the future due to the change in standard practices or codes of conduct governing scheduling coordinators. The load following analysis should be updated to reflect any significant change in: 1)

scheduling coordinator practices and scheduling bias, 2) increased levels of renewable market penetration, and 3) lower overall system reserve margins.

PG&E appreciates the opportunity to comment on this report and looks forward to further progress in understanding the integration costs of renewable generating technologies.