

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to
Continue Implementation and
Administration of California Renewables
Portfolio Standard Program.

Rulemaking R.11-05-005

**REPLY COMMENTS OF THE GREEN POWER INSTITUTE
AND THE CALIFORNIA BIOMASS ENERGY ALLIANCE
ON THE AC'S RULING AND THE RPS PROCUREMENT PLANS**

July 30, 2014

Julee Malinowski Ball, Ex. Dir.
California Biomass Energy Alliance
1015 K Street
Sacramento, CA 95814
Ph: (916) 441-0702
Fax: (916) 441-3549
julee@ppallc.com

Gregory Morris, Director
The Green Power Institute
a program of the Pacific Institute
2039 Shattuck Ave., Suite 402
Berkeley, CA 94704
ph: (510) 644-2700
fax: (510) 644-1117
gmorris@emf.net

**REPLY COMMENTS OF THE GREEN POWER INSTITUTE
AND THE CALIFORNIA BIOMASS ENERGY ALLIANCE
ON THE AC'S RULING AND THE RPS PROCUREMENT PLANS**

Pursuant to the March 26, 2014, *Assigned Commissioner's Ruling* regarding the 2014 RPS procurement plans, as modified by the April 16, 2014, ALJ's *Ruling*, in Proceeding R-11-05-005, the **Order Instituting Rulemaking to Continue Implementation and Administration of California Renewables Portfolio Standard Program**, the Green Power Institute (GPI), the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security, and the California Biomass Energy Alliance (CBEA), provide these *Reply Comments of the Green Power Institute on the AC's Ruling and the RPS Procurement Plans*.

These Reply Comments are being filed jointly by the GPI and the CBEA. The Green Power Institute is the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security, a public-purpose, environmental-research institution located in Berkeley, CA. The GPI performs research into the environmental implications of renewable energy production, and advocates for public policies favorable to the development of renewable energy. The California Biomass Energy Alliance is the trade organization of the solid-fuel biomass energy industry in California, representing the state's 30 operating biomass power plants. The California biomass power industry comprises 650 MW of reliable baseload power, which accounts for approximately ten percent of the state's RPS energy supply.

In addition to the information and questions posed in the March 26, 2014, *Ruling*, Commission Staff distributed an email on July 21, 2014 asking eight questions regarding the development and application of an integration-cost adder within the context of the LCBF bid-ranking process used for RPS solicitations. In these Reply Comments we discuss the issue of instituting an integration-cost adder, addressing the parties' Comments filed on July 2, and the questions posed in the July 21 email.

Definition of an Integration-Cost Adder (inc. Staff question no. 1)

The integrated electricity grid experiences, as a matter of course, unexpected fluctuations due to deviations from predicted levels of both power supplies and user demand. This is handled by deploying a variety of ancillary services (regulation, stationary and spinning reserves, etc.), all of which impose costs on the system. These costs have traditionally been accepted as system costs, and are considered a recoverable-cost component of the retail sales of electricity, much as the procurement cost of wholesale power is treated. Every energy supplier and user interconnected to the grid entails a need for ancillary services, but until now these costs have not been considered to vary enough from one market participant to the next to necessitate using them as factors in selecting among generating alternatives that are available to power the grid.

Intermittent renewable generators, specifically wind and solar generators, introduce a novel set of unplanned fluctuations to the grid, with the result that grid operators incur costs to cope with these intermittency-related fluctuations. The costs of accommodating intermittency are in addition to the costs for ancillary services that are common to all sources and sinks interconnected to the grid. The additional cost burden involved with integrating intermittent renewables into an interconnected grid is generally recognized to be substantial enough that virtually all parties to this proceeding agree that it ought to be taken into account in selecting among new energy-supply sources that are under consideration for powering the grid.

Among the many parties discussing the issues of integration-cost adders there appears to be two basic approaches to defining what the integration-cost adder should include. On the one side are parties who want to focus the adder specifically on the costs attributable to intermittency, such as real time fluctuations in output due to wind shifts and clouds, and costs associated with inaccuracies in day-ahead and hour-ahead schedules due to the forecasting uncertainty that is an inherent characteristic of intermittent resources. On the other side are parties who want all grid-support services needed to accommodate a generator to be part of the integration-cost adder, in which case every procurement decision

for every kind of resource, whether conventional gas, baseload renewable, or intermittent renewable, would have to consider the associated integration costs.

In our opinion, we believe that in the interests of simplicity and workability the integration-cost adder should be applied to intermittent generating resources only, and should represent only the specific costs of accommodating the intermittency of the generators, not all of the costs of ancillary services incurred, some of which are shared with all generators, as well as with energy users.

In their Opening Comments, PG&E argues that dispatchable renewable resources (baseload renewables) not only impose lower ancillary-services burdens on the grid than intermittents, they argue that they also provide positive RA-capacity value, and deserve to be credited for this attribute in the LCBF bid-ranking process. We agree with PG&E's assessment of the capacity value of dispatchable renewables, and believe that it lends more credence to the approach of limiting integration-cost adders to intermittent generators only, and including in the adders only the costs directly attributable to intermittency. Other operational attributes, such as RA capacity value, should be dealt with in their own right in the context of the LCBF process. We join PG&E in seeking an overhaul of the entire LCBF process.

Finally, in response to question no. 1 in the July 21 Staff email, we are opposed to changing terminology that has already entered into common use, such as the term "integration costs," even if a precise definition has not yet been agreed upon. Integration costs are commonly understood to refer to the costs of accommodating the intermittency of intermittent generating resources, and the term should continue to be used in this way in this and other Commission proceedings. Adding new terminology at this point will only confuse the situation, not clarify it.

Urgency for the 2014 RPS Solicitations (inc. Staff question nos. 5 & 7)

The issue of instituting an integration-cost adder for intermittent generating resources has been a subject of interest to this Commission for at least five years. It has been a matter of

joint investigation by this Commission, the CEC, CAISO, and other participants for at least that amount of time. So far the Commission has taken the position that until a methodology is agreed upon, and a value is determined and vetted in an accessible public process, a value of zero should be used. Some of the parties, in their *Opening Comments*, support the continuation of this cautious approach. Other parties urge the Commission to step up now and institute an integration-cost adder in time for the 2014 RPS solicitations, which are expected to be initiated before the end of the calendar year.

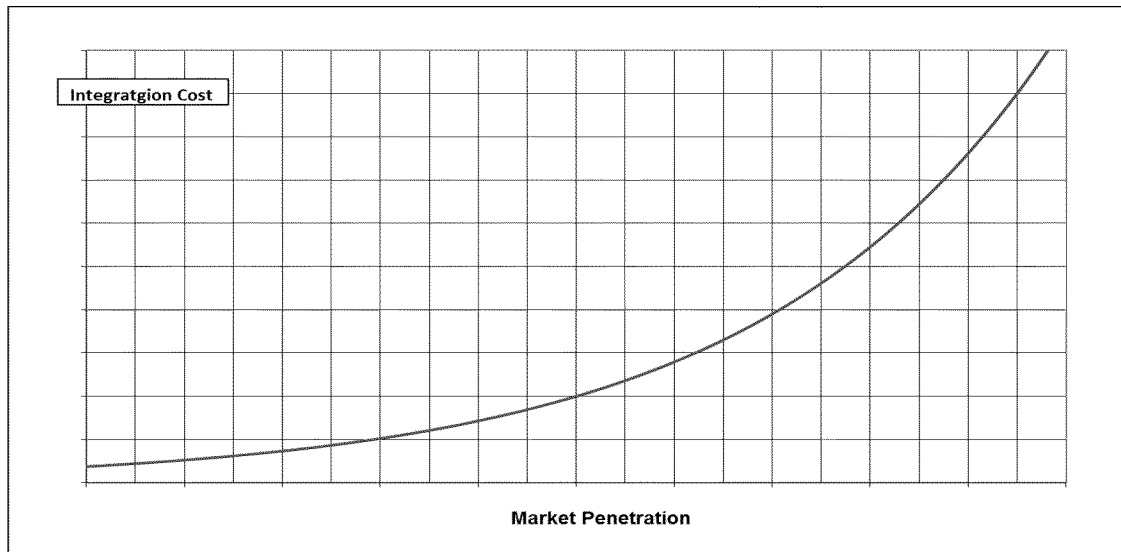
We note that instituting the use of an integration-cost adder is only one part of overhauling the LCBF bid-ranking process, an activity that is included in the Scoping Memo for this proceeding. Introducing integration-cost adders in time for the 2014 RPS solicitations will certainly enhance the quality of the solicitations. However, this should in no way delay the long-overdue comprehensive overhaul of the LCBF process, all of which will benefit the RPS program. There is no reason why the comprehensive LCBF overhaul cannot be completed in time to be used in the 2015 RPS solicitation cycle.

The evidence from the marketplace for instituting the integration-cost adder in time for the 2014 solicitations is clear: Between now and the end of 2020, when the 33%-renewables benchmark is mandated to be achieved, virtually all of the expected growth in renewable generating capacity in the state is expected to be in a single renewable resource, solar, and more specifically, using one particular technology for converting that resource – photovoltaics (PV). In our opinion, the evidence from the marketplace strongly supports those who believe in the urgency of instituting an integration-cost adder now, in time for the 2014 RPS solicitations. Note that we are not questioning the efficacy of PV. We are concerned about the lack of diversity in the deployment of resources to meet the renewables mandate.

Question no. 7 from the July 21 Staff email suggests: “Integration costs may rise as the saturation level of renewable resources increases over time.” In fact, the law of diminishing returns ensures that this should be the case. Applied to the case of RPS procurement, it is expected that the greater the penetration of generators in any particular

renewable category, the greater the cost of accommodation for the next unit of the same kind of generator. If these costs are properly accounted for in the bid-selection process, then over-reliance on a particular category of renewables should be self-correcting, and a diverse mix of resources should result. That self-correction is not happening in the marketplace today, hence the urgent need for the use of integration-cost adders in the 2014 RPS solicitations.

The figure below shows graphically the relationship that can be expected between the saturation level for a particular type of renewable, and the integration cost. Because the relationship is non-linear, the integration-cost adder for a given type of intermittent generating resource increases as its level of market penetration increases. Each RPS solicitation is held against the background of a given fleet of operating renewable generators, and a given portfolio of projects-in-development. The integration-cost adders should be determined as a function of those parameters at a given point in time, thus reflecting the marginal costs of adding additional capacity for each category of intermittent renewables.



Process Issues Regarding the Integration Adder (inc. Staff question nos. 2 & 4)

There appears to be general agreement among the parties that the methodology to be used in determining the integration-cost adders for future RPS solicitations should be developed in a public process under the auspices of the Commission. Once the methodology has been determined, there are divergent opinions about who should perform the calculations.

The IOUs favor allowing themselves to determine the integration-cost adders that will be used in any given RPS solicitation. Most of the other parties believe that the adders should be determined in a publicly-accessible process, probably by Commission staff. This can be done either in the RPS proceeding, or in the LTPP proceeding. We join with those favoring a public process that cannot be controlled or manipulated by the IOUs.

In order to include an integration-cost adder in the 2014 solicitations, time is very much of the essence. We join many parties in suggesting that the Commission needs to develop a set of interim adders for 2014, while embarking on a more deliberative process to develop a more accurate and enduring methodology to be used in future solicitations. The interim adders need to be based on a simplified approach, which almost surely precludes detailed system modeling.

Technical Issues Regarding the Integration Adder (inc. Staff question nos. 3,6,8)

One of the important issues that must be addressed in developing a methodology for calculating an integration-cost adder is the degree of granularity at which the calculation is to be performed. In our opinion, separate adders need to be determined at a minimum for each of the major categories of intermittent generators: wind, solar-thermal electric, and solar photovoltaic. Moreover, the category of solar-thermal electric may need to be further subdivided into generators with storage, and generators lacking storage. The intermittency in each of these categories of renewables imposes burdens on the grid that are distinct from the others, and the value of the adders should be expected to be different as well.

In their Opening Comments, some parties suggest that the integration cost for a particular intermittent generator depends not only on the resource and the technology employed, but also on locational factors such as resource quality, output profile, and access to transmission capacity. In order to meet the time constraints involved in establishing a set of interim integration-cost adders for the 2014 RPS solicitations, we recommend that adders be determined on either a statewide basis, or possibly an IOU service-territory-specific basis.

It remains to be seen at what level of geographic granularity these adders need to be determined beyond the 2014 RPS solicitations, when a more accurate methodology can be developed. We join a number of the parties in recommending that a workshop be held as soon as possible in order to facilitate the development of a methodology for the determination of integration-cost adders to be applied to bids from intermittent renewables in future RPS solicitations, including looking at the question of granularity, as well as other unsettled factors.

Question no. 3 in the July 21 Staff email presents three basic analytical approaches that could be used to determine integration-cost adders:

- Use publicly available reports and data sources
- Use market-based cost data
- Perform system modeling studies

Each of these approaches received support from various parties in their July 2, 2014, Opening Comments. Based on our review of the parties' Opening Comments, the first approach is endorsed only for use in the rapid development of interim integration-cost adders for the 2014 solicitations. It is not the preferred approach of any party for use in the long term. PG&E, in their Opening Comments, presents a list of relevant published studies that have been performed in a variety of Western jurisdictions, all outside of California. We agree that using these studies in the development of interim adders might entail the least amount of effort, which is a virtue insofar as meeting the challenging timeline is concerned.

However, without even considering the issues of methodology and comparability in the various studies, it seems to us that the conditions and circumstances of the renewable energy industry are sufficiently different in California as to render dubious the applicability of these out-of-state studies to the California situation. This is due in no small part to the fact that intermittent renewables have reached a higher degree of market penetration in California than they have in other Western jurisdictions, and using the logic in the figure (above), it is likely that the marginal value of the costs in those jurisdictions are not applicable to the California situation. We are of the opinion that much better interim adders can be determined within the limited timeframe that is available using the kind of market-based cost approach that is proposed by CalWEA.

The final two approaches presented in question no. 3 in the Staff email (second and third bullet points above) appear to be the only options that are under consideration for developing a methodology for determining integration-cost adders for use in RPS solicitations beginning in 2015. PG&E and CalWEA provide the most comprehensive proposals for determining integration-cost adders in the long term, and their proposals are the subjects of Question nos. 6 and 8 in the July 21 Staff email. The PG&E proposal relies on the system-modeling approach, while the CalWEA proposal employs the market-cost data approach.

In the long-term procurement plan (LTPP) proceeding, a concurrent proceeding that is before this Commission, there are currently a couple of major system-modeling efforts underway that are looking at integration costs, among a variety of variables under study. The LTPP process runs on a two-year cycle, with system modeling typically conducted during the first year of the cycle. We expect the RPS proceeding to coordinate with the LTPP on the modeling work, and to incorporate the results, as appropriate, into the integration-cost adders that are used in future RPS solicitations. In our opinion it is premature to decide whether to simply defer to the LTPP for purposes of determining integration-cost adders for future RPS solicitations, or to use the LTPP modeling studies as one source of data for whatever methodology is adopted for determining future RPS integration-cost adders.

The PG&E proposal breaks the integration-cost adder into three components:

- Real-time fluctuations in output
- Forecast uncertainty (e.g., deviations from hour-ahead schedules)
- Residual multi-hour ramping needs

The CalWEA proposal also breaks the integration-cost adder into three components:

- Ancillary services
- Flexible (ramping) services
- Long-term need for new RA capacity

SCE, in their Comments, breaks the integration-cost adder into four or five components:

- Wear and tear due to increased cycling
- Increased need for system reserves
- Increased need for flexible (ramping) resources
- Long-term need for new RA capacity
- (Portfolio fit) ??

In the opinion of the GPI, there is more commonality than differences among the positions of these three parties on what should be included as the components of the adder. All of the three include components for the additional amount of ancillary services that are needed to balance the fluctuations associated with intermittency, and for the increased need for ramping capacity to compensate for the impact of intermittent renewables on net-system demand curves. CalWEA and SCE, but not PG&E, also propose a cost component based on the long-term need for new capacity to be developed specifically to deal with intermittency. CalWEA and SCE acknowledge that there is currently no need for new capacity on the CAISO grid, and agree that this cost component is likely to have a near-zero value between now and 2020.

In order to be most useful and effective, a set of integration-cost adders needs to be determined for each RPS solicitation cycle, which have occurred more-or-less annually over the past decade. The adders should represent marginal integration costs at the time of the solicitation for the next unit of each category of intermittent generator that is being bid

into the solicitation. As the market-penetration of any given category of intermittent renewable increases, it is expected that the marginal integration cost of new installations will increase according to the relationship illustrated in the figure above.

Conclusion

A methodology for the determination of integration-cost adders should be developed and incorporated into California's RPS program as quickly as possible, in time to be used in the 2014 RPS solicitations. Integration costs refer to the costs that are required to compensate for the operational challenges specifically associated with the intermittency of intermittent renewable resources. In our opinion, integration-cost adders should only be applied to bids offering intermittent energy products, and should include only the costs associated with handling intermittency.

The methodology for determining integration-cost adders, and the determination of the adders, should be done in an open, publicly-accessible process conducted by the Commission. There is no need at this point in time to select between the candidate methodological approaches for determining the adders, using market-based cost data or performing system-modeling studies. All options should be on the table when the process of developing the methodology begins, and we encourage the Commission to hold a workshop soon to initiate the process.

Based on current trends in the California renewable-energy marketplace, GPI and CBEA believe that there is an urgent need to develop and implement an interim integration-cost adder in time to be used in the 2014 RPS solicitations. At the same time, we urge the Commission to move forward with the development of a methodology for the determination of integration-cost adders that can be used in future, post-2014 RPS solicitations. We emphasize that this is only a part of the greater effort that needs to be conducted to overhaul the entire LCBF process. It is imperative to begin the long-overdue overhaul of the entire LCBF process as quickly as possible.

Dated July 30, 2014

Respectfully Submitted,



Gregory Morris, Director
The Green Power Institute
a program of the Pacific Institute
2039 Shattuck Ave., Suite 402
Berkeley, CA 94704
ph: (510) 644-2700
e-mail: gmorris@emf.net

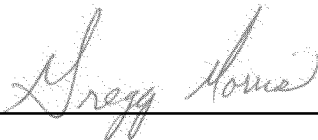
And for:

Julee Malinowski-Ball, Ex. Dir.
California Biomass Energy Alliance

VERIFICATION

I, Gregory Morris, am Director of the Green Power Institute, and a Research Affiliate of the Pacific Institute for Studies in Development, Environment, and Security. I am authorized to make this Verification on its behalf. I declare under penalty of perjury that the statements in the foregoing copy of *Reply Comments of the Green Power Institute and the California Biomass Energy Alliance on the AC's Ruling and the RPS Procurement Plans*, filed in R.11-05-005, are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

Executed on July 30, 2014, at Berkeley, California.



Gregory Morris