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 11-05-005 (Filed May 5, 2011)

COMMENTS OF BRIGHTSOURCE ENERGY, INC. ON THE MARCH 26th ASSIGNED COMMISSIONER'S RULING AND THE DRAFT 2014 RENEWABLES PORTFOLIO STANDARD PROCUREMENT PLANS

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BrightSource Energy, Inc. ("BrightSource") appreciates this opportunity to provide its comments on the March 26, 2014, Assigned Commissioner's Ruling Identifying Issues and Schedule of Review for 2014 Renewables Portfolio Standard Procurement ("RPS") Plans ("ACR") and on the Draft 2014 RPS Plans, in accordance with the revised schedule for comments approved by Administrative Law Judge ("ALJ") DeAngelis on April 16, 2014. BrightSource limits its comments to the integration adder issue, including responses to the Commission's questions regarding development of an integration adder, which are addressed in Section 7.3 of the ACR.

I. Integration Cost Contributions Can- and Must- Be Recognized Without Complex, Falsely Precise Quantification Effort

BrightSource strongly supports adoption of an integration adder solely for new project bid evaluation purposes. While we have provided responses to the Commission's thoughtful questions on the integration adder (in Section II herein), we are concerned that certain approaches to the development of an adder would be unduly cumbersome, complex and time intensive. Further, at the time of bidding, integration cost assessments over the life of a contract

will be necessarily imprecise, and any purportedly precise measurements would provide false confidence. The Commission's goal should therefore be to develop an integration adder methodology that is simpler, more intuitive and easier to implement than the alternatives, such that it can be implemented in a shorter time frame. BrightSource does recognize that it will be challenging to maintain these principles in the development of the integration adder, while providing for differentiation between bid proposals and revisions to quantification over time. An indicative integration adder methodology need to be clearly understood by market participants and empower utilities to procure resources that will tend to reduce integration burdens and provide an overall least cost, reliable energy supply.

The contributions of a proposed generator to integration costs is specific to its technology, physical location and grid topography placement; it also can only be understood relative to other local and grid-wide resources, depending on the integration challenge being considered. It is nonetheless possible for a utility, in its bid assessment, with the approval and oversight of the Commission, to estimate whether and to what degree a new resource will tend to aggravate or alleviate specified categories of integration challenges and then incorporate this assessment into bid evaluations.

A number of studies are attempting to more precisely quantify the extent of integration needs and costs, including the work being undertaken under the Long-Term Procurement Plan ("LTPP") and Resource Adequacy proceedings. These efforts can inform the development and implementation of an integration adder, which should be updated on a routine basis to adjust for significant portfolio changes.

We recommend that the Commission, working with stakeholders, design an appropriate metric that will simply indicate the degree to which a resource is likely to exacerbate overall

integration expenses, relative to the other resources being considered in the bidding process. This indicative integration adder, updated on a routine basis, should ensure that bids with preferred integration attributes are properly recognized for contributions to overall least cost procurement and reliability.

II. Responses to Renewable Integration Adder Questions (ACR Section 7.3)

Question 1. Many parties, in various venues, have expressed interest in the development of an integration adder. Staff understands this concept to mean an addition to the criteria utilities use to select contracts that would reflect the impact a resource has on the transmission system. In simple terms, using this criterion, if designed appropriately, a rampable and dispatchable resource would score better than a baseload resource that does not ramp well, which would, in turn, score better than an intermittent resource that requires firming and shaping. Please explain:

1.a. If this definition matches your understanding and why or why not?

1.b. If not, what is your definition of an integration adder?

The proposed definition generally captures the notion of integration costs, with two notable missing elements. The "indirect costs" of a resource affecting "ongoing electrical corporation expenses," within the meaning of Section 399.13(a)(4)(i) of the Public Utilities Code, is not simply a question of dispatchability or ramping capability. First, it is important to consider the ability of the resource to provide positive value by offering ancillary services.[1] This could either be captured within a "net" integration adder or appropriately valued in the benefits component of the net market value ("NMV") calculation.

[1] *See, e.g.,* http://energy.gov/sites/prod/files/2014/01/f7/csp_review_meeting_042313_denholm.pdf

Second, the timing of the resource's output relative to the system state, particularly during times of over- or under-generation, is a substantial factor in determining whether the resource is increasing or decreasing overall system integration costs. Again, this could be evaluated within an integration adder if these costs – such as negative prices or compensated curtailment – are not fully and granularly considered in the projection of a bid's energy value in the NMV calculation. While dispatchability may affect timing of output (depending on the extent of dispatchability), that is not dispositive. A generating unit may positively or negatively impact overall integration costs, whether it is baseload or intermittent, renewable or non-renewable, or offering energy generation with or without ancillary services. The determination of a resource's overall contribution to integration costs must rely on its overall interaction with the grid, relative to the interactions with the grid of other supply and of load.

There are several characteristics that should be examined as potential components of an integration adder and in determining whether an individual resource exacerbates or mitigates integration costs. Some of these components have been explicitly identified as market products or system cost sources, while others that have very real impacts on overall costs do not yet receive explicit compensation or assessment. These products or potential costs sources may include:

- Existing and new Ancillary Services – including regulation, and reactive power/voltage control
- Flexi-ramp product
- Flexible Capacity Resource Adequacy
- Out-of-market payments or systems costs for additional start-ups / cycling

1.c. Do you believe an integration adder is needed at this time? Why or why not?

Yes. Integration costs are a function of the overall nature of the supply fleet and its interactions with load. Costs, efficiency and reliability are best served if incremental procurement is tailored to improve integration of all resources, and particularly to promote integration of low carbon resources. The converse is equally true; costs and inefficiency may increase, and reliability may be challenged, when the procurement process does not fully consider integration concerns.

Question 2. As reflected in the first question above, the definition of a renewable integration adder is not clearly understood. Given this ambiguity, what is your interpretation of how an integration adder would be used? Please consider the follow sub-questions:

2.a. What form should any integration adders take? For example, should they be incorporated into the value side or cost side of the least cost best fit equation, and why?

Integration adders should be considered solely in the bid evaluation process, to determine relative value of bids with respect to integration costs. The utilities should be empowered to differentiate between bid offers based on the attributes of the delivered electricity product, including if a particular technology or project configuration is expected to cause additional costs within the electrical system to operate reliably. However, because the volume and degree of these costs are a product of the portfolio of power resources procured by the utilities overall, it is not reasonable for individual generation resources to bear the cost responsibility during operations. Simply, an integration adder should be used for bid comparisons and to provide market signals to bidding entities, but not as a basis to transfer costs related to integrating new resources once in operation.

As discussed above, individual generation resources either may reduce the overall cost of integration or may increase those costs, depending on the nature of the other resources in the portfolio. The Commission should determine the extent to which these contributions by a resource should be considered entirely as components of an integration adder, or if the beneficial integration-related attributes of a resource should be separately calculated as part of the benefits component of the NMV equation (such as the provision of ancillary services or flexible resource adequacy).

2.b. Is an integration adder a single static value, a value that changes over time, or many values that change over time? How frequently should it be updated?

As integration costs and values are a function of how an individual generation resource fits into an overall portfolio, an integration adder is necessarily dynamic. At the same time, the integration adder must provide a reasonably accurate market signal to help developers understand which resources and technology configurations will result in a least net cost outcome for the ratepayers. If not re-evaluated, a static integration adder would eventually signal procurement of the sub-optimal resources, potentially adding to, rather than subtracting from, procurement costs and reliability concerns.

Certain types of integration costs are likely to accrue in a non-linear fashion when similar generation resources are interconnected to the power system. Energy Division is currently considering a similar effect of higher penetrations of a given generation resource within its proposed implementation of an Effective Load Carrying Capacity methodology for assessing Resource Adequacy value of wind and solar resources. The integration adder methodology needs to be dynamic to account for these "saturation" effects and, therefore, must be updated on

a specified periodic basis to reflect the changes to the portfolio and remaining demand for characteristics that address integration needs.

In order to incentivize highest value bid configurations and least cost procurement overall, the integration adder methodology needs to recognize these concepts and how they affect the market and resulting customer rates. This suggests that the quantification of an integration adder needs to be examined on a routine basis.

2.c. With what granularity should such adders be calculated and applied, in terms of resource types and locations? E.g. for how many (and which) distinct categories of resources, and for how many (and which) distinct geographic locations?

An estimated integration adder for an individual bid is necessary to specifically assess the relative cost and value of the individual generation resource, including the particulars of its design and contract. Only such a specific assessment can be expected to contribute to least overall cost procurement. For example, short-term ramp control may be offered by contract and control of inverters, whereas 3-hour ramps can be avoided by contract and control of co-located energy storage equipment. These physical and contractual attributes must both be assessed when assigning an integration adder.

Integration needs will vary in terms of both characteristics and geographic location. Rather than an arbitrary number of geographic distinctions, or geographic lines, the assessment should consider the topography of the grid relative to the way in which the specific integration concern functions. For example, short-term intermittency may be mitigated by geographic diversity, while ramping needs may be specific to regions of the grid.

2.d. How far out in time should we project (e.g., model) system operation when calculating adders for any "current" vintage of resource additions? E.g., 10 years out, 20 years out, for one target year, or for a multi-year time horizon? Should this depend on contract length?

BrightSource reserves comment on this issue at this time, and looks forward to stakeholder discussion on the topic.

2.e. Should an integration adder take into consideration only the cost of integrating renewables or should it also consider the positive attributes of intermittent renewable generation such as the ability to potentially hedge against rising natural gas prices? If so, how?

It would be discriminatory for the Commission to look only at the cost of integrating renewables; conventional resources have, for example, minimum load and minimum run time constraints that impose integration costs. While integration costs should be evaluated across the portfolio, other costs and benefits, such as fuel hedging, reduction in carbon and other emissions, and other policy priorities are best considered through other means, rather than mixing them into integration cost analyses. Of course, in considering integration needs or any other procurement, the Commission's Loading Order, as recently clarified, must be followed. Integration costs should be limited solely to electrical system costs needed to balance the system for reliability.

Question 3. With respect to questions above, what is the framework you recommend for calculating an integration adder?

BrightSource recommends that the Commission design a framework through a stakeholder process, consistent with the principles discussed in these comments, particularly the principles espoused in Section I regarding ease and speed of implementation.

Questions 4. The Commission's Long-term Procurement Plan (LTPP) proceeding is currently considering the use of stochastic based probability models to forecast the need for flexible capacity ten years into the future (i.e., by 2024). Modeling results from stakeholders that submit testimony in this proceeding may determine that there is a need for resources that can provide flexible capacity within the LTPP's study horizon. Should an integration adder be derived from these flexibility studies? Please consider the following sub-questions when providing an answer:

4.a. Results from these studies may be several years away. Is it appropriate for the Commission to wait until LTPP studies are completed to develop a new integration adder? If not, provide an alternative realistic approach for analysis with a roadmap for implementation.

BrightSource agrees that the work being undertaken in the LTPP and, as discussed earlier, the Resource Adequacy proceedings should inform the integration adder framework. Nonetheless, there is ample information available now, specific to the CAISO system, for indicative assessments that would enable the utilities, and the Commission, to properly compare the *relative* contribution of individual bids to integration costs. Ignoring available information, including evolving information derived from other proceedings, risks increasing integration costs unnecessarily by failing to differentiate between resources that will add to, or subtract from, those costs.

4.b. Should the Commission develop an interim renewable integration adder and update the adder once the results of the LTPP flexibility studies are known? If so, what interim approach do you recommend and why is this approach valid?

Please see our response to Question 4.a.

4.c. Publicly available studies are available that attempt to define and project the value of an integration adder. Should the Commission adopt an integration adder based on these studies

rather than utilize results from the upcoming flexibility studies? Why or why not?

Please see our response to Question 4.a.

Question 5. Should an integration adder reflect the actual impact of a resource, even if new infrastructure is not needed to integrate the resource, or only reflect incremental increases in infrastructure needs? In other words, if there is no need identified for new flexible resources, should the adder still be set at zero? Please explain your answer.

The identification of need for new flexible resources through a proceeding such as the LTPP is only one component of the integration adder quantification analysis. Integration costs depend not only on whether new flexible capacity is required; they also depend on how existing capacity is operated. Costs associated with compensation for providing integration services to support incremental resources will occur regardless of whether new flexible resource procurement is authorized. Integration costs are comprised of both wholesale energy market payments and monthly capacity payments. These costs sources are easy to identify, but would need to be allocated in part, in the form of an integration adder, in a fair manner to incremental resources proposed in bids.

While no need for additional flexible resources has been identified as of yet, in this examination of an integration adder methodology the Commission should consider how to account for past, current and future procurement that may culminate in new flexible resource needs. It is problematic to propose an integration adder that contemplates future costs from new resources yet to receive a need determination; however, if the Commission waits until there is a need determination, it will essentially be too late to incorporate these costs into an integration adder for proposed new resources. In fact, this would be discriminatory, since the accumulation

of past procurement would in part drive the need (that is, unless the new flexible resources are identified to support only new incremental procurement to accommodate a policy mandate, for example). An alternative approach to resolve this "chicken or egg" issue would be to credit bids appropriately, potentially through the integration adder or other components of the NMV calculation, that are likely to defray or defer a need determination for flexible resources.

III. CONCLUSION

BrightSource commends the Commission and its staff on its consideration of developing an integration adder methodology. Integration costs are real; their assessment, however, is necessarily imprecise and relative, particularly when considering the changing grid landscape over time. The Commission should work with stakeholders adopt a straightforward, flexible framework providing indicative, differentiating value attributions that can be applied to bid assessment. A framework of this type will enable utilities to procure resources that will tend to reduce integration costs and minimize overall procurement costs, while maintaining reliability and progressing towards clean energy supply goals.

Dated: July 2, 2014

Respectfully Submitted,

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VERIFICATION

I, David Schlosberg, am the Senior Manager for Regulatory & Market Affairs for BrightSource Energy, Inc. I am authorized to make this Verification on its behalf. I declare that the statements in the foregoing copy of *Comments of Brightsource Energy, Inc. on the March 26th Assigned Commissioner's Ruling and the Draft 2014 Renewables Portfolio Standard Procurement Plans* are true of my own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters I believe them to be true.

I declare *under* penalty of perjury that the foregoing is true and correct.

Executed on July 2, 2014, at Oakland, California.

/s/ *David Schlosberg*

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