

**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
SECOND ASSIGNED COMMISSIONER'S RULING ISSUING
PROCUREMENT REFORM PROPOSALS AND ESTABLISHING
A SCHEDULE FOR COMMENTS ON PROPOSALS**

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BrightSource Energy, Inc. (“BrightSource”) appreciates this opportunity to provide its comments on the Second Assigned Commissioner’s Ruling Issuing Procurement Reform Proposals and Establishing a Schedule for Comments on Proposals, issued on Oct. 5, 2012 (the “ACR”), and submits the following comments to the California Public Utilities Commission (“Commission”) in accordance with the provisions of the ACR and the Nov. 5, 2012, email notification by Administrative Law Judge Simon extending the time for submission of comments and reply comments on the ACR.

I. Introduction

At the outset, BrightSource notes its support for the Commission’s effort to more clearly establish the standards for reviewing Renewables Portfolio Standard (“RPS”) contracts, and strongly agrees that changes to the RPS procurement regime should only be made if they benefit the ratepayer, the market and the regulator. The measure of success of the RPS program is whether it provides a stable, reliable, cost-effective energy supply over the long term, as well as

its broader economic and environmental goals.¹ The Commission should fashion the elements of the RPS program, particularly the Standards of Review for long-term contracts, to align incentives of all market participants to work towards achieving these objectives.

While there is much in the ACR that would improve the likelihood that the RPS program will be successful over time, there are some well-intentioned proposals that would inadvertently frustrate its long-term success. Most importantly, the ACR does not address the challenges to cost-effectively maintaining reliability, RPS attainment and AB 32 compliance as penetration of currently commercially-deployed renewable resources increase. The changing nature of the energy system and the challenges of successful integration of higher levels of renewables are increasing the need for innovative technologies, including storage. Unfortunately, aspects of the ACR would increase burdens on the innovative technologies that the future grid will need. Proposed requirements to force rebidding of contracts that are amended to incorporate storage into future solicitations, in particular, would not in the best interests of ratepayers, the market or the regulators. The Standards of Review should instead provide incentives for developers to offer innovative technologies, including storage, that will help California meet its future challenges, and for counterparties to improve the value of existing agreements for the benefit of ratepayers.

¹ The statutory goals of the RPS program set out in Section 399.11(b) are as follows: (1) displacing fossil fuel consumption within the state; (2) adding new electrical generating facilities in the transmission network within the Western Electricity Coordinating Council service area; (3) reducing air pollution in the state; (4) meeting the state's climate change goals by reducing emissions of greenhouse gases associated with electrical generation; (5) promoting stable retail rates for electric service; (6) meeting the state's need for a diversified and balanced energy generation portfolio; (7) assistance with meeting the state's resource adequacy requirements; (8) contributing to the safe and reliable operation of the electrical grid, including providing predictable electrical supply, voltage support, lower line losses, and congestion relief; and (9) implementing the state's transmission and land use planning activities related to development of eligible renewable energy resources.

II. Comments in Response to the Questions Posed by the ACR

BrightSource's specific responses to the questions posed by the ACR follow, and use the outline and numbering provided in the ACR.

4.1. Proposal – Standards of Review for IOUs' Shortlists

1. Provide comments on the strengths and weaknesses of increasing the level of review of IOUs' shortlists. If an alternative review process or review standards are proposed, include justification for the proposal.

BrightSource has no opening comments on this topic.

4.2. Proposal – Establish Date Certain for Request for Commission Approval of Contracts

2. Discuss the strengths and weaknesses of the proposal to set a time requirement for requesting Commission approval of an RPS contract. What impact will it have on the market, ratepayer, and regulator? If an alternative time requirement is proposed, include a justification for the proposal.

While BrightSource supports the Commission's efforts to ensure timely completion of contract negotiations and timely submission of executed contracts to the Commission, the Commission should nonetheless be aware that deadlines such as those proposed could be used as an instrument of bargaining power. An arbitrary deadline can force counterparties to drop reasonable negotiating positions simply to avoid termination. A more reasonable approach, which would help ensure all parties are focused on timely completion but not create imbalance in negotiations, would be to require an explanation for the reason that negotiations required more than one year. If explanations are required, they could be verified by the independent evaluator.

4.3 Proposal - Expedited Review of RPS Purchase and Sales Contracts

3. The above proposal defines expedited review prerequisites differently for contracts <5 years and those \geq 5 years in term length. Comment on the appropriateness of the 5 year term length distinction. If an alternative is proposed, include a justification for the proposal.

BrightSource has no opening comments on this topic.

4. The above proposal allows for contracts that meet all of the prerequisites to be submitted with Tier 1 and Tier 2 Advice Letters for contracts <5 years in term length and contracts \geq 5 years in term length, respectively. Comment on the appropriateness of the designated Advice Letter Tier. If an alternative is proposed, include a justification for the proposal.

The proposal would inappropriately exclude contracts for technology that have not been commercially proven, regardless of the need for the attributes of the technology or the degree to which innovation may enhance the project's performance with respect to Least-Cost, Best Fit criteria. Multiple studies have shown that as renewables penetration increases, significant challenges to maintaining reliability will emerge, and the utility of currently commercially-deployed technologies (such as photovoltaics ("PV") with standard inverters and without storage, or wind designed to generate energy primarily in peak wind conditions) will lessen, particularly with respect to the new "shifted" peak and capacity value.² Procuring more of these commercially-deployed technologies, without incorporating modifications of new technologies that have not yet been commercially deployed, will potentially exacerbate over-generation

² For capacity value and the curtailment implications of different concentrated solar power ("CSP") and PV portfolios, see Denholm, P. and M. Mehos, Enabling Greater Penetration of Solar Power via the Use of CSP with Thermal Energy Storage, National Renewable Energy Laboratory, Technical Report, NREL/TP-6A20-52978 (Nov. 2011), at <http://www.nrel.gov/csp/pdfs/52978.pdf>; and Mills, A., and R. Wiser, "Changes in the Economic Value of Variable Generation at High Penetration Levels: Pilot Case Study of California," Lawrence Berkeley National Laboratory, LBNL-5445E (June 2012), at <http://eetd.lbl.gov/ea/emp/reports/lbnl-5445e.pdf>.

problems at solar and wind peak times, and further reduce the future capacity value of generation that is designed to maximize output at solar and wind peaks.

Rejecting contracts filed by advice letter that deploy innovative technologies, and requiring those contracts to instead follow the lengthier and more complicated application process, will deter procurement of those technologies. Requiring a more complex, lengthier and uncertain process (for which there is very limited experience for RPS contracts) will also increase risk, thus increasing the cost of any innovative projects that may be procured. The increase in hurdles for innovative technologies would ultimately threaten the ability of California to reliably sustain high penetrations of renewables in a cost-effective and low-carbon fashion. This result would harm ratepayers, the development of the market, and the likelihood of successfully achieving regulators' objectives of attaining California's RPS and AB 32 while keeping costs at a minimum and ensuring reliability.

In order to cost-effectively address these challenges, while attaining both RPS and AB 32 greenhouse gas requirements, deployment of innovative technologies will be required. The innovations are not limited to any one technology class, and likely will include: PV with advanced inverters and potentially with storage; wind turbines now being designed to provide energy at times other than peak wind; geothermal with increased dispatchability; and advanced solar thermal designs, including solar thermal with storage. While many of these innovations are being driven by cost, changing needs for time of delivery and increased needs for ancillary services, others are being driven by environmental reasons, such as reductions in land use, reduced impacts to species, and reductions in overall grid greenhouse gas and other emissions.

This is a unique time in our nation's modern history for our energy supply; the needs of the energy grid have yet to be clearly identified and technology for generation and to some extent

for transmission has not fully reached maturity and stability (both with respect to renewables and new, more flexible and less-emitting conventional technologies). Understandably, the market has not yet had the opportunity to respond to these needs and developments and, thus, mature to provide clear and stable pricing for the attributes needed for a cost-effective, reliable energy supply. Limiting the ACR's streamlining proposals for commercially proven technologies and requiring innovative technologies to be reviewed using the application process, will harm ratepayers, who will be exposed to increased costs and decreased performance relative to that innovative technologies can supply. It will further harm the market by raising the bar for those innovative technologies and deferring the maturation process that will help establish clear pricing signals for the attributes that the system will increasingly need in the future. Regulators will also be harmed as the goals of cost-effectively attaining California's RPS, AB 32 and a reliable energy supply will be hindered.

BrightSource is also concerned that requiring Phase 2 studies for contract approval would be premature, particularly for contracts with later commercial online dates ("CODs"). This requirement could have a deleterious effect on the transmission queue, as entities may stay in the queue longer in the hopes of obtaining a contract, prompting identification of more transmission than is truly necessary and artificially increased Phase 2 study costs.

5. The above proposals do not apply to sales contracts five years or greater in term length. Is there a market need to extend an expedited approval process to sales contracts five years or greater in term length?

Yes. Although a Tier 2 Advice Letter process is appropriate for sales contracts longer than five years, as the proposals suggest, there remains a need to have the Tier 2 approval process completed more quickly. First, delay in approving contracts creates uncertainty in the market, which increases risk and the cost of delivering renewable energy to ratepayers. Second,

the uncertainty created in the market both chills investment in the market and distorts the actual extent of demand, causing developers to continue to expend resources in developing projects subject to contracts that may not ultimately be approved. Third, regulators with ballooning dockets and limited resources, including the Commission, its staff and the California Independent System Operator Corporation (“CAISO”), are harmed by expending resources on reviewing projects that may ultimately not be approved by the Commission.

Clearer standards of review on to project viability would be helpful, although the screens proposed by the ACR are not well-suited to assessing viability for projects that are intended for CODs that are further out in time, as discussed below.

6. The above proposal requires contracts using the expedited review process to be selected from competitive solicitations but it also allows bilateral contracts <5 years in term length if they are of equivalent or better net market value than offers from a prior solicitation for similar products. Would a solicitation for short-term transactions be robust enough to adequately benchmark short-term bilateral transaction if the contract is negotiated bilaterally?

BrightSource has no opening comments on this topic.

7. The above proposal extends the expedited approval process to contracts greater than five years in term length. Because long-term contracts are primarily for generation from facilities that are not yet operating, viability screens are proposed as prerequisites to reduce RPS portfolio risk for the IOUs and ratepayers. Comment on the strengths and weaknesses of the proposed viability screens.

As noted above, the viability screens incorporated in the proposal are not well-suited to projects that are far from their proposed on-line dates. It is unrealistic to require permit applications to be filed more than three years in advance of CODs in California, as many permits required for development will expire if construction is not commenced within a reasonable time after permit issuance. In other states, which may offer first points of interconnection with

California balancing area authorities, permitting takes significantly less time than in California, and the danger of expiration of the permit prior to commencing construction would be even higher. Similarly, Phase 2 studies, permits for transmission construction and filings for rate recovery would also be unreasonable for projects with later CODs; recent history has shown that queues have been significantly thinned with time, and requiring advanced states of maturity of transmission may result in identification of more expensive upgrades than ultimately turn out to be necessary.

Instead, BrightSource recommends that viability screens focus on the experience of the developers (including the members of their teams, particularly for new companies). The demonstrated ability of a developer to design, finance, construct and deploy significant projects, along with successful demonstrations of the technology to be deployed, are far better indicators of whether a project will be built as provided for in the contract under review. The purpose of the development security is also to provide a reasonable and proportional safeguard to ratepayers, the market and regulators that contracts will be deployed.

4.4. Proposal – Improve RPS Power Purchase Agreement Standards of Review

A. Proposed Standards of Review for Power Purchase Agreements from Solicitations

8. The above proposal requires contracts to be consistent with an IOU's net short approved in the most recent Procurement Plan. Propose how this criterion could be applied to an individual contract.

BrightSource has no opening comments on this topic.

9. Are the proposed cohorts to be used to evaluate the reasonableness of a contract's price, net market value, and viability appropriate? If not, provide an alternative proposal and justification for the alternatives.

The proposal outlined in the ACR implicitly presumes that current market pricing adequately reflects the value of renewable resources over the lifetime of the contracts that are under review. However, it is increasingly clear that this is not the case. The peak (net of inflexible, nondispatchable generation) will shift into the late afternoon or early evening, with net load at unprecedented lows during the day, rapid and substantial ramps up and down as the solar day starts and ends, and spikes of generation at night due to wind production at times that system load is minimal and the ability to incorporate that generation reliably is limited.³ The proposal's excessive reliance on market pricing and discounting of currently qualitative factors, runs the risk of prioritizing procurement of resources that are best suited to meet yesterday's needs but will fall short of supporting the future grid.

The anticipated future needs may not be well-quantified, but that does not mean that those needs are any less real, nor does it mean that accounting for those needs is any less urgent. In fact, as discussed above, procurement of resources that do not meet these needs is likely to exacerbate future grid reliability, increase costs and threaten the success of the RPS and AB 32 regulatory regimes.

The proposal to use today's valuation metrics, which do not adequately consider future needs, to reject contracts that a utility selected as the least cost, best fit resources for its portfolio, is a procrustean solution that would be detrimental to ratepayers, the market and the regulator. The Standards of Review should prioritize, not minimize, valuation of attributes that will be most needed in the future. BrightSource recommends that the Commission undertake a focused series of workshops on least-cost, best-fit criteria to better identify the resource needs of the future grid,

³ CAISO, "Track I Direct Testimony of Mark Rothleder on Behalf of the California Independent System Operator Corporation," Before the Public Utilities Commission of the State of California, Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans, Rulemaking 10-05-006, Submitted July 11, 2011; Mills and Wisner, 2012, op cit.

including renewable integration needs. These workshops should be designed to develop more refined quantitative and qualitative measures to transparently select the resources that will best serve the overall portfolio needs. By adopting such refined metrics, the Commission can send a more effective signal to the market to further develop technologies that best meet those needs and to offer those technologies to the utilities.

B. Proposed Standards of Review for Bilateral Power Purchase Agreements

10. Are there additional reasons for executing bilateral power purchase agreements outside of the solicitation process other than those stated above (e.g. fleeting opportunity, very high viability, near-term commercial operation date, etc.)? If yes, provide the additional reasons and the justifications for bilateral contacts outside of a solicitation.

Yes; there are additional reasons for bilateral power purchase agreements. As the Commission has noted over the course of the RPS program, bilateral contracts are intended to enable the RPS-obligated entities to more broadly meet needs that may not be captured by solicitations.⁴ Solicitations, and price-based selection of bids from those solicitations, are ideally suited for fungible, liquid products. In the early stages of the RPS program, while renewables penetration was low and the carrying capacity of the grid to absorb these resources remained very high, the differences between renewables were of less importance, and these resources could largely be treated as if they were fungible. Now, as penetrations increase, the need to take into consideration varying renewable generation characteristics- not just between

⁴ For example, D.06-10-019, presaging broader concerns on how to meet increasingly specific RPS needs, addressed the concerns that Energy Service Providers had in accommodating renewables given their limited overall portfolios, and the appropriateness of using bilaterals to more surgically meet the ESPs needs, stating that the nearly exclusive use of bilaterals “provides more flexibility than a solicitation process for an ESP to develop a portfolio of RPS contracts suitable for its business.” D.06-10-019 at p. 27. As the RPS program matured, the Commission determined that early concerns about bilateral contracts were addressed through equivalent review standards as are applied to contracts that result from solicitations. As a result, Decision 09-06-050 requires that bilateral contracts be subject to review by the utility's Procurement Review Group and its Independent Evaluator, and clarified that the MPR should be used as a price benchmark in the evaluation of the reasonableness of bilateral contracts. D.09-06-050, at p. 29.

different technologies, but between locations for the same technologies- is growing. The same wind or solar technology, located in a different wind or solar resource area with different weather, may offer a very different portfolio fit—providing helpful diversity or exacerbating variability challenges by increasing the concentration of that form of generation from the same area.

While it has been the Commission’s longstanding approach for utilities to use least cost, best fit considerations to select resources rather than simply using price, in cases where specific needs are required to balance portfolios or emerging needs necessitate experimentation, a solicitation may be an inefficient means of obtaining the best resources to meet those needs. Where a need is focused and limited, such as for a particular geographic area (e.g., for transmission considerations) or weather region (for solar or wind, which is weather-dependent), for specific technology so as to increase diversity and reliability, to meet niche needs in the portfolio, or to explore the potential of a particular technological advancement, a bilateral negotiation may be a more cost- and resource-effective means of procurement than a solicitation.

A solicitation requires substantial commitments and resources by both the utility and those submitting bids, as well as for the regulator to review the complete solicitation process. Decision 09-06-050 established review safeguards for review, such as ensuring that bilateral contracts are subject to Independent Evaluator and Procurement Review Group procedures, and found that with those safeguards in place it was unnecessary for bilateral contracts to be subject to the “discipline of a competitive solicitation.” D. 09-06-050 at p. 28. The Commission has never limited bilateral power purchase agreements to fleeting temporal opportunities and should not begin to do so here, particularly without having a full examination of the costs and benefits of departing from its precedent.

11. Are the proposed cohorts to be used to evaluate the reasonableness of a contract's price, net market value, and viability appropriate? If not, provide an alternative proposal and justification for the alternatives.

As discussed above, the cohorts identified do not adequately address the future needs of the grid, and their exclusive use is likely to result in procurement of resources that are not well-suited to optimized portfolios. The viability criteria are also not well-suited to establishing viability of contracts with CODs in later years, as also discussed above. BrightSource recommends focused workshops to elaborate on selection criteria as well as viability criteria.

12. Are the proposed criteria and standards within the minimum viability requirements appropriate for bilaterally offered projects? If not, provide alternative criteria and standards and justification for the proposal.

Please see the response to Question 11.

C. Proposed Standards of Review for Amended Contracts

13. The proposed SOR are for contract amendments that substantially modify a contract. Are additional SOR needed for other types of contract amendments (i.e., contract amendments that do not substantially modify approved contracts) or does review of "contract administration" within the IOUs' Energy Resource and Recovery Account filings encompass all other contract amendment types? If additional SOR are needed, propose alternative or additional SOR and describe the type of contract amendment that they would apply to.

In the development process, or in the evolution of transmission solutions, it may be beneficial to the utility, the ratepayer and the developer to modify the point of interconnection. Where that modification does not substantially increase the overall expense to ratepayers, BrightSource recommends that any change in the contract that may be required for such a change should be submitted under a Tier 2 advice letter. If the change in interconnection would present

a substantial overall increase in expense to ratepayers, the modification should be submitted for review under a Tier 3 advice letter.

14. Are the proposed cohorts to be used to evaluate the reasonableness of a contract's price, net market value, and viability appropriate? If not, provide an alternative proposal and justification for the alternatives.

There is no clear benefit, and substantial harm to ratepayers, the market and the regulator, in the proposed SOR requirement that technology changes, including addition of storage, trigger the need to rebid the project in the next solicitation. The ratepayer, market and regulator are best served if there are incentives for parties to improve upon the value to ratepayers of an approved contract.

Improvements in technology may make it possible to reduce costs of development, construction and operation; improve flexibility of operation, the quality and quantity of attributes delivered, and the time of day products are delivered; and reduce environmental impacts, in terms of in terms of land use, species impact and indirect carbon and other emissions. Absent contract modifications, ratepayers would be required to pay the higher costs, and bear the increased burdens, of the original technology specified by the original contract.

After the considerable expenditure of time and resources on negotiating, executing and obtaining approval of a contract, as well as obtaining site control, site assessment, transmission interconnection, and the permitting of a project, it would be unreasonable to expect a developer to risk losing a project by rebidding it into a solicitation even if technology improvements would allow it to build the project at lower cost. As a result, the benefits that would otherwise have inured to the ratepayer and the regulator, through enhanced grid reliability, economic performance and/or environmental impact, would be lost. The market would be harmed over

time, as the pace of introducing innovative technology would slow, reducing the rate at which the cost of that technology would decrease.

Whenever a utility and its counterparty developer have the opportunity to improve upon an existing contract, to the benefit of the ratepayer, they should be given every incentive to do so, and not be penalized by requiring rebidding. Locking in the technology at the stage described in the approved contract, with no reasonable opportunity to upgrade when all concerned would benefit, serves no good purpose— particularly when the need for technology improvements is so great.

15. Should minimum project development milestones (as proposed for the SOR for bilateral contracts) be incorporated into the SOR for amended contracts as a way to ensure only viable projects proceed with contracts, thus decreasing the amount of risk in the IOUs' RPS portfolios? If not, provide alternative SOR that would reduce the risk of IOUs' RPS portfolios.

Utilities can and do assess the viability of a project multiple times; at the time the contract is first negotiated, when contracts are amended, and throughout the term of development. The utilities are best suited to determine the appropriate balance of milestones, and there is no indication that the milestones they have demanded for amended contracts are insufficient. In addition, utilities currently monitor the developer's efforts to implement its project, including the milestones prescribed by the contract. Additional prescriptions would ultimately not benefit ratepayers, as additional requirements would: decrease the flexibility that is often very helpful in addressing unforeseen issues that frequently arise in development; would increase complexity and costs of financing, presuming the requirements are added prior to financial close; and cause highly detrimental problems with financing if added subsequent to financial close.

16. The above proposal proposes that the process by which IOUs must seek Commission approval of RPS contracts be based, in part, on the contracted amount of expected annual generation. Comment on how projects with multiple contracts for total facility capacity and projects with contracts for multiple phases should be treated under the proposal or propose an alternative delineation and justification.

The proposal would significantly increase the burden of contract approval, in terms of length of time, resources and complexity, for technologies that are not yet commercially proven at a time when the need for those technologies is increasing. In addition, the proposal would require publicizing information, including price, which is kept confidential for all other contracts based on long-standing confidentiality rules established by the Commission. If few changes to the energy system were anticipated and characteristics needed for the energy system well-defined long enough to develop fluid, established and stable markets, then the proposal might serve ratepayers, the market and the regulators. As these are not the present conditions, and as the proposal represents a significant departure from Commission precedent that has not been the subject of proportional consideration and discussion among market participants, the drastic changes contained in this proposal are highly unlikely to be beneficial to the success of the RPS program.

With respect to projects with multiple contracts or multiple phases, it is not clear why they should necessarily require an application if the project(s) would otherwise qualify for consideration through advice letter. The cost advantages of economies of scale of large projects benefit ratepayers, and requiring such projects to proceed through an application would chill procurement and unnecessarily deny ratepayers the advantage of this benefit. Regardless of whether the contracts are reviewed through an advice letter or application, the utility should inform the Commission of the extent to which the different parts of the project are interdependent. If the viability of each of the varying parts of the project is fully independent,

the utility should inform the Commission that each contract can and should separately be evaluated. If the viability of any parts of the project are interdependent, the utility should inform the Commission of the nature of the interdependence and the Commission should consider the contracts as a package.

17. Comment on the appropriateness of the requirement that contracts that are expected to provide annually more than one percent of the IOU's total bundled sales in the first full year of deliveries should be filed by application. Provide justification for any alternative proposals.

It is unclear why an application would provide any benefit whatsoever over consideration by advice letter simply because of the quantity of generation at issue. The only reason to proceed with an application over an advice letter is to address unusually complex factual questions, for which a more detailed evidentiary record would be helpful to the regulator and merits the expenditure of resources by the utility, the developer, other stakeholders and the Commission. The volumetric cutoff for advice letters appears arbitrary and without meaningful support.

18. Are there additional circumstances for which RPS contracts should be submitted by application for Commission approval? For example, if the contract exceeds a certain capacity or it would cause a rate impact above a certain amount the IOU would be required to seek approval with an application. In the proposal, provide a justification and include not only the circumstance(s) but also any limits (e.g., all contracts that cause more than a 0.05 cents/kWh rate increase must be filed by application because that would cause a statistically significant rate increase to the average electric rate in California).

Please see the response to Question 17. Rate impact, while an important criterion, is not necessarily better evaluated through an application process than through an advice letter. The Commission should focus resources on the nature of the questions at issue, rather than the degree of impact. As larger projects provide economies of scale that increase efficiency and reduce

cost, it does not serve the interests of ratepayers, regulators and the market increase relative burdens on these projects.

19. Are there any items (e.g., contract's net market value or viability score) in addition to the contract terms and conditions that should be part of the public record? Provide a justification.

The confidentiality of RPS contract review and approval has been the subject of significant Commission precedent, after thorough proceedings and lengthy, careful consideration. Changes to confidentiality should be made only after thorough evaluation of the costs and benefits of those changes, in the context of Commission precedent.

4.5 Proposed Standards of Review for Unbundled Renewable Energy Credits

- 19[sic]. Are there any other cohorts that unbundled REC contracts should be compared to? If yes, propose additional appropriate cohorts and the justification for their appropriateness.

BrightSource has no opening comments on this topic.

- 20 [sic]. Are there any criteria in addition to need authorization, consistency with an IOU's renewable net short, consistency with Commission decisions, and price that should be considered by the Energy Division and the Commission when reviewing unbundled REC contracts for reasonableness?

In determining whether unbundled REC contracts are reasonable, the Commission should consider whether bundled REC contracts would provide ratepayers with better benefits. The second and third procurement categories established by Senate Bill (SB) 2 (1X) provide maximum levels for those categories, rather than mandatory procurement percentages. Ultimately, the success of the RPS program depends upon delivering all of the benefits it is intended to convey, and the ability of unbundled REC contracts to deliver those benefits is limited.

21 [sic]. Is there a methodology that would accurately allow the comparison of unbundled REC contracts to bundled procurement? Please provide a quantitative example.

It would be difficult to reduce all of the RPS objectives to simple quantitative metrics, as many of those objectives, such as benefits to human health and the environment are complex and not currently well quantified. However, the CAISO has undertaken some analyses of greenhouse gas and other emissions under various scenarios, and it may be possible for the Commission, working with federal and state environmental agencies, to develop a reasonable methodology that could be used for purposes of comparison.

4.6 Proposal – RPS Independent Evaluator Reports

22 [sic]. Comment on the strengths and weaknesses of the IE providing supplemental calculations.

BrightSource has no opening comments on this topic.

23 [sic]. Are there additional evaluation criteria or requirements for IEs assigned to RPS solicitations that the Commission should adopt?

BrightSource has no opening comments on this topic.

5. Other Procurement Reforms

5.1 Implementation of New Least-Cost Best-Fit Requirements

24 [sic]. Please describe how the Commission should implement each of the four specific topics listed in Section 399.13(a)(4)(A). Please include quantitative examples where relevant.

The first two elements identified in 399.13(a)(4)(A) are necessarily relative, rather than absolute. The identification of total costs, or renewable integration costs, is highly dependent on the nature of the overall portfolio and the extent to which its elements have been selected so as to provide an optimal whole. To date, procurement has been focused on a more granular basis, with each element considered primarily on its own. Only more recently, with the opportunity to diversify technology and geographic/renewable resource areas, and to add beneficial characteristics through storage and other advances, has procurement of renewables proceeded in a more strategic way.

The costs of integration are clearly not zero; the longer that procurement continues without reflecting integration costs, and without considering the future costs and benefits of differing technologies to future energy, capacity, and ancillary services needs, the less likely it is that the resources that are procured will cost-effectively meet those future needs. BrightSource recommends focused workshops to discuss how scenarios can be used to identify baseline costs to the energy system to maintain reliability, and additional costs that may result from the selection of varying resources, so as to identify the least cost, best fit alternatives.

The third element, with respect to project viability, is discussed above in response to Question 7. Project viability assessments are highly dependent on how far in advance contracting occurs relative to the COD. Advanced contracting allows for reduced costs and enhanced ability to efficiently plan transmission; while it does reduce concrete milestones available for assessment as of the time of contract approval, it also allows more time to resolve issues that arise during development. The availability of concrete milestones would provide a misleading sense of comfort, as significant hurdles often become apparent only near the end of permitting. The most important criteria to determining project viability is the experience of the

development team in designing, financing, constructing and deploying similar projects. An evaluation of the effectiveness of the project viability calculator, and an assessment of the factors that are most likely to indicate the ultimate success and timeliness of projects, may be appropriate to provide a more realistic and meaningful assessment that would meet the requirements of 399.14(a)(4)(iii).

Last, with respect to workforce matters, uniform reports on employment, including skill level, training and recruitment could be adopted to develop the information required by 399.14(a)(4)(iv), and BrightSource would be happy to assist in developing the format for such reports.

25 [sic]. For each of these four topics, please compare your implementation proposal with the existing LCBF methodology as set out in D.04-07-029 and applied in the 2011 RPS Procurement Plans approved in D.11-04-030.

With respect to 4 (ii), based on our experience in recent Commission proceedings and commercial negotiations, BrightSource believes that the benefits of concentrated solar power with thermal storage are not fully and appropriately valued under existing least cost, best fit valuation in several major areas, as described below. Regardless of the technology to which least cost, best fit is applied, if this full range of capabilities is not appropriately valued, electrical corporations' portfolios will not achieve the lowest net value (i.e., costs minus benefits).

As background, BrightSource notes that concentrated solar power with thermal storage is similar to geothermal plants, in that it combines the attributes of a thermal power plant that includes a synchronous generator with a clean energy source. However, unlike most current geothermal plants, concentrated solar power with thermal storage also offers the potential for dispatchability — the ability, within the constraints of the plant, to shift energy optimally to

higher value hours, or within hours, as these change from day to day. These plants can also provide ancillary services. Concentrated solar power plants with different designs and thermal storage capacities can be flexible operational resources that support the power system without added emissions as wind and solar penetration increases.

Turning to the categories of value, below are some of BrightSource's concerns regarding the interpretation of least cost, best fit in relation to the assessment of plant operations:

- Energy valuation. While least cost, best fit does recognize energy value, most utility procurement procedures are not configured to model a partially dispatchable renewable plant, where stored energy will be available on a variable basis, and can be shifted across days.
- Ancillary services. While least cost, best fit may allow valuation of ancillary services, this is still in nascent stages.⁵ Concentrated solar power with thermal storage may be the first renewable energy technology to offer these services, but other technologies should be given the incentive to offer these benefits as well.
- Capacity value. While least cost, best fit does consider capacity value, neither (i) future reductions in capacity value of nondispatchable renewable resources that are designed to provide power at solar or wind peaks, which will no longer reflect load peak, nor (ii) the enhanced capacity value of plant dispatchability has not yet been incorporated into this

⁵ For the first studies to model CSP with thermal storage providing ancillary services is Madaeni, S.H., R. Sioshansi, and P. Denholm, "How Thermal Energy Storage Enhances the Economic Viability of Concentrating Solar Power," *Proceedings of the IEEE* (2012).

analysis. Without consideration of these issues, capacity value over the life of long term renewable energy contracts cannot be accurately assessed.⁶

- Power quality. Least cost, best fit does not provide the opportunity to quantitatively value power quality for two reasons: first, power quality attributes are not valued through markets; second, while there is clear evidence that the operational attributes that concentrated solar power with thermal storage brings to the power system, such as frequency response,⁷ will be valued under future conditions, there is no consensus on what the level of that economic value will ultimately be.

Second, least cost, best fit does not acknowledge several areas of comparative valuation, under which concentrated solar power with thermal storage has greater value than competing, inflexible renewable resources.

- Integration and curtailment costs. While the Commission does not currently allow consideration of integration costs under least cost, best fit, it has been clearly demonstrated that concentrated solar power with thermal storage has lower integration costs than solar PV and may in fact provide operational attributes that could enhance the reliable integration of PV, and reduce curtailment.⁸ There is little uncertainty about the

⁶ See, e.g., Denholm, P., S. H. Madaeni and R. Sioshansi, Capacity Value of Concentrating Solar Power Plants, National Renewable Energy Laboratory, Technical Report, NREL/TP-6A20-51253 (June 2011). See <http://www.nrel.gov/docs/fy11osti/51253.pdf>.

⁷ See, e.g., GE Energy Consulting, California ISO (CAISO) Frequency Response Study, Final Draft, Prepared by Nicholas W. Miller, Miaolei Shao, and Sundar Venkataraman (Nov. 9, 2011), at <http://www.caiso.com/Documents/Report-FrequencyResponseStudy.pdf>.

⁸ On the curtailment implications of different CSP and PV portfolios, see Denholm, P. and M. Mehos, Enabling Greater Penetration of Solar Power via the Use of CSP with Thermal Energy Storage, National Renewable Energy Laboratory, Technical Report, NREL/TP-6A20-52978 (Nov. 2011), at <http://www.nrel.gov/csp/pdfs/52978.pdf> (hereinafter "NREL Tech Report").

need for additional ancillary services and “net” load following requirements as renewable penetration increases.⁹ While there may be uncertainty about the resulting integration costs, ignoring them clearly distorts procurement and will increase future grid costs and reliability challenges.

- Effects of higher RPS on valuation. A number of national lab studies and surveys have confirmed that concentrated solar power with thermal storage retains capacity value and energy value as system conditions change with increasing solar penetration.¹⁰ These are not insignificant value differences, and in fact in themselves can possibly close the gap between current concentrated solar power and PV bids.

26 [sic]. For each of these four topics, and for your least cost, best fit proposal as a whole, please explain how your proposal would affect costs ultimately paid by ratepayers for RPS-eligible energy, using quantitative examples where relevant.

By utilizing a holistic procurement approach that integrates renewables and other resources, and focusing on the likely needs of the future grid so as to avoid procurement that will increase reliability and integration challenges, ratepayers would ultimately pay less for reliable energy service. The cost of any individual element has relatively little impact on rates; it is the functioning of the system as a whole, much like an ecosystem, that ultimately determines the costs ratepayers will see. This is the fundamental problem with overemphasis on the price of

⁹ See, e.g., CAISO, Integration of Renewable Resources: Operational Requirements and Generation Fleet Capability at 20% RPS, August 31, 2010 at <http://www.caiso.com/2804/2804d036401f0.pdf>; California ISO (CAISO), “Track I Direct Testimony of Mark Rothleder on Behalf of the California Independent System Operator Corporation,” Before the Public Utilities Commission of the State of California, Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans, Rulemaking 10-05-006, (filed July 11, 2011).

¹⁰ See, e.g., , Mills, A., and R. Wiser, “An Evaluation of Solar Valuation Methods Used in Utility Planning and Procurement Processes,” Lawrence Berkeley National Laboratory, forthcoming 2012; Mills, A., and R. Wiser, “Changes in the Economic Value of Variable Generation at High Penetration Levels: Pilot Case Study of California”, June 2012b, Lawrence Berkeley National Laboratory, LBNL-5445E, at <http://eetd.lbl.gov/ea/emp/reports/lbnl-5445e.pdf>; see NREL Tech Report.

bids in solicitations, rather than the effect on overall ratepayer costs of additions to the energy supply, which is necessarily a portfolio-based assessment. For example, wind turbines in one area may be less expensive than in other areas of the state, but overconcentration of wind turbines in one region exposes the grid to increased volatility as the wind resource in that area fluctuates, increasing actual cost to ratepayers. This is equally true for technology diversity as it is for geographic diversity; the heterogeneous nature of renewables necessitates a strategic, portfolio-based approach to ensure reliable availability of the full suite of characteristics needed to maintain reliability.

There are several quantitative studies that are showing convergence in the valuation of concentrated solar power with thermal energy storage under different scenarios, and more will be released shortly. Several recent studies clarify that concentrated solar power with thermal energy storage achieves dramatically increased comparative economic value at higher solar penetrations.¹¹ For example, Mills and Wiser calculate that in California, concentrated solar power with 6 hours of storage offers a \$19/MWh benefit over solar PV at 5% penetration of solar energy, and a \$35/MWh benefit by 10% penetration — roughly the penetration levels currently being planned towards in California under the 33% RPS.¹² Yet other studies of solar PV integration costs generate higher values than assumed these studies, in the range of \$5-10/MWh, suggesting that the value difference may be greater.¹³

27 [sic]. For each of the four topics, and for your least cost, best fit proposal as a whole, please explain how your proposed criteria would contribute to the efficiency of the RPS procurement process.

¹¹ Id.

¹² Id.

¹³ Id.

Please see response to Question 26.

28 [sic]. What additional topics, if any, should be part of the least cost, best fit process? Please provide a detailed discussion of each topic, using quantitative examples where relevant.

As discussed above, it is essential to the long-term reliability and cost-effectiveness of the grid to anticipate future needs, as the procurement of today will provide resources that will supply energy for decades into the future. As academic research is increasingly converging on a shared view of the grid's future, the results of that research should be explicitly taken into consideration in procurement planning. As part of the least cost, best fit evaluation process, the utilities should project the ability of the fleet procured to date to meet anticipated future needs, and identify the areas in which those future needs are not well-covered. Procurement should then prioritize the needs that are not as well-covered, rather than more generally focus on overall RPS targets, current resource adequacy definitions, or the like. This will better ensure the efficient and reliable functioning of the future grid, as well as ensuring the costs that ratepayers are exposed to are kept to a minimum.

5.2 Green Attributes Standard Term and Condition

29 [sic]. In view of the adoption of RECs as the basis for RPS compliance, is STC 2 still necessary in its entirety? Please explain in detail, with reference to: 1) current commercial practice; 2) the regulatory requirements of the Commission and any other relevant agencies (e.g., the California Energy Commission (CEC) and the California Air Resources Board (CARB)); and 3) recent legislation related to biofuels (Assembly Bill (AB) 1900 (Gatto); AB 2196 (Chesbro); and SB 1122 (Rubio)).

BrightSource believes the current definition of Green Attributes has been widely accepted by market participants. Changing the definition at this time could be disruptive, and the benefits of proposed changes have not been clearly identified.

30 [sic]. Are specific elements of STC 2 still necessary? If so, which ones? Please explain in detail, with reference to: 1) current commercial practice; 2) the regulatory requirements of the Commission and any other relevant agencies (e.g., CEC and CARB); and 3) recent legislation related to biofuels (AB 1900 (Gatto); AB 2196 (Chesbro); and Senate Bill (SB) 1122 (Rubio)).

Please see response to Question 29.

31. Even if not necessary, is STC 2, or are some elements of STC 2, still useful in RPS procurement contracts? Please explain in detail, with reference to: 1) current commercial practice; 2) the regulatory requirements of the Commission and any other relevant agencies (e.g., the CEC and CARB); and 3) recent legislation related to biofuels (AB 1900 (Gatto); AB 2196 (Chesbro); and SB 1122 (Rubio)).

Please see response to Question 29.

III. Conclusion

BrightSource appreciates the efforts apparent in the ACR to bring greater structure and certainty to RPS procurement. As the nature of the energy grid and its sources of energy supply are changing rapidly, and the needs of grid reliability are changing, it is essential that RPS procurement rules recognize that the market must be given time to adjust to those changing needs. The more rigid aspects of the proposed standards of review, and particularly the highly negative approach applied to technology advancement and contract modification, would be better suited to a mature, stable market with relatively few anticipated future changes. If RPS procurement is fixed on yesterday's needs, the program will fail to cost-effectively and reliably meet tomorrow's challenges. BrightSource respectfully requests that contracts for new technologies, and contract modifications to adopt technology advancements, be more favourably

treated than in the proposals in the ACR.¹⁴

Respectfully Submitted,

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¹⁴ Project viability screens, focused on developer experience and success in designing, project financing and constructing projects, should of course be applied to both new and commercially deployed technologies.

VERIFICATION

I, Joseph Desmond, am the Senior Vice President of Government Affairs and Communications of BrightSource Energy, Inc. I am authorized to make this Verification on its behalf. I declare that the statements in the foregoing copy of the attached COMMENTS OF BRIGHTSOURCE ENERGY, INC. ON THE ON THE SECOND ASSIGNED COMMISSIONER'S RULING ISSUING PROCUREMENT REFORM PROPOSALS AND ESTABLISHING A SCHEDULE FOR COMMENTS ON PROPOSALS 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 November 20, 2012 at Oakland, California.

/s/ Joseph Desmond

Joseph Desmond