

## **SUMMARY**

PG&E filed Advice Letter (AL) 3703-E on July 9, 2010, requesting California Public Utilities Commission (Commission) review and approval of two amended power purchase agreements with BrightSource Energy, Inc. (BrightSource). The PG&E and BrightSource agreements concern two new solar thermal facilities that are being developed in Ivanpah, California. The PPAs for the BrightSource Ivanpah 1 and Ivanpah 3 facilities were originally approved by the Commission on August 21, 2009 in Resolution E-4266. The PPAs are amended to reflect and accommodate significant changes to the project's development required for permitting and project financing purposes.

The amendments reflect changes to the projects' installed capacity, expected generation, commercial online date and the price that PG&E will pay for delivered energy. Other major terms of the PPAs as originally approved in Resolution E-4266 are unchanged and continue in full force and effect.

The following table summarizes specific features of the facilities and compares the terms of original and amended PPAs

<b>Generating Facility</b>	<b>Amended Ivanpah 1</b>	<b>Original Ivanpah 1</b>	<b>Amended Ivanpah 3</b>	<b>Original Ivanpah 3</b>
<b>Capacity (megawatts)</b>	118 MW	110 MW	130 MW	200 MW
<b>Expected Deliveries (gigawatt-hours per year)</b>	304 GWh/yr	284 GWh/yr	336 GWh/yr	516 GWh/yr
<b>Commercial Operation Date</b>	July 1, 2013	July 1, 2012	December 31, 2013	July 31, 2013

## **DISCUSSION**

### **Pacific Gas and Electric Company requests approval of two amended power purchase agreements with BrightSource Energy, Inc.**

On July 9, 2010, Pacific Gas and Electric Company (PG&E) filed Advice Letter (AL) 3703-E requesting Commission approval of amendments to PG&E's 25-year power purchase agreements (PPAs) with BrightSource Energy, Inc. (BrightSource) for the Ivanpah 1 and Ivanpah 3 facilities.

PG&E's original PPAs with BrightSource for generation from the Ivanpah facilities were approved by Resolution E-4266 on August 12, 2009. BrightSource is developing the Ivanpah Solar Power Complex, comprised of three concentrating solar thermal facilities, based on distributed power tower and heliostat mirror technology, in which heliostat (mirror) fields focus solar energy on power tower receivers near the center of each heliostat array.

On August 31, 2007, subsidiaries of BrightSource submitted an Application for Certification<sup>1</sup> (AFC) to the California Energy Commission<sup>2</sup> (CEC) to develop three solar thermal power plants in San Bernardino County, California on federal land managed by the Bureau of Land Management (BLM).<sup>3</sup> The CEC's AFC process, in conjunction with the BLM, and other agencies as necessary, will consider Best Management Practices that have been developed for solar energy projects in order to minimize or mitigate negative impacts on natural resources.<sup>4</sup>

The CEC issued its Presiding Member's Proposed Decision (PMPD) for the Ivanpah Solar Power Complex on August 3, 2010.<sup>5</sup> It is evident through documents filed by BrightSource in the CEC's proceeding and the PMPD that

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<sup>1</sup> The Ivanpah Solar Electric Generating System AFC filed with the CEC is available at: <http://www.energy.ca.gov/sitingcases/ivanpah/index.html>

<sup>2</sup> The California Energy Commission is the lead agency (for licensing thermal power plants 50 megawatts and larger) under the California Environmental Quality Act (CEQA) and has a certified regulatory program under CEQA.

<sup>3</sup> Because the Project would be located on BLM administered land, the Project must also be compliant with the National Environmental Policy Act (NEPA).

<sup>4</sup> The CEC's Best Management Practices are available at: <http://www.energy.ca.gov/2009publications/CEC-700-2009-016/CEC-700-2009-016-SD-REV.PDF>

<sup>5</sup> A copy of the proposed decision is available here: <http://www.energy.ca.gov/2010publications/CEC-800-2010-004/CEC-800-2010-004-PMPD.PDF>

BrightSource has significantly revised the project from what was envisioned under the original PPAs.

The most notable change to the project is that the capacity of Ivanpah 3 will be reduced from 200 megawatts (MW) to 130 MW. During the permitting process for the Ivanpah facilities, stakeholders identified significant environmental concerns, most notably with the Ivanpah 3 facility, which was found to have desert tortoises on site. The desert tortoise, *Gopherus agassizii* is a federally listed threatened species. In order to obtain the necessary permits, BrightSource amended its application to reduce the project's footprint. This modification resulted in a 35% decrease in capacity for Ivanpah 3 and an 8% increase in capacity for Ivanpah 1. The contract quantities, or expected generation, for each PPA were adjusted to account for the modified capacity of each facility. BrightSource's security requirements were also adjusted to reflect the change in contract capacities.

According to PG&E, BrightSource sought amendments to the Ivanpah 1 and 3 PPAs in order to accommodate significant changes to the project and project development plan as a result of the conditions for obtaining permits from the California Energy Commission (CEC) and the Bureau of Land Management (BLM), as well as, conditions for financing the project, including obtaining a Department of Energy (DOE) Loan Guarantee.

AL 3703-E included detailed analysis on the projects' cost, documenting specific cost drivers and how the inputs and assumptions have changed from the original PPAs. Consistent with Resolution E-4199, BrightSource provided cash flow models comparing the original cost assumptions for the Ivanpah 1 and Ivanpah 3 facilities and updated models documenting the cost impacts (positive and negative) associated with unforeseen project development requirements. PG&E asserts that it reviewed the cost information provided by BrightSource to verify whether the cost changes justify the price increase. PG&E also compared the higher priced Ivanpah PPAs to offers received in its most recent RPS solicitation to determine whether the amended PPAs are competitive with other market opportunities.

PG&E involved an independent evaluator (IE), according to the Commission's procurement rules where a contract amendment results in a price that exceeds the market price referent. Consistent with Resolution E-4199, the IE was provided cash flow models from the original PPA and updated to reflect current costs and assumptions. AL 3703-E included an IE report that concluded that the amended PPAs were reasonable considering the modifications made to the project since the PPAs were originally approved. The IE also validated PG&E's assertion that the Ivanpah PPAs at the higher price remain competitive with other

comparable procurement opportunities available to PG&E. Energy Division staff issued a data request to PG&E seeking further clarification on the cost changes discussed in the advice letter and the corresponding changes to the PPA price.

Based on the information provided in AL 3703-E, amendments to the Ivanpah PPAs are [omitted] given the changes in capacity and other environmental mitigation measures, as well as, changes to the projects' development plan in order to facilitate financing.

All other terms and conditions of the Ivanpah PPAs, as originally approved in Resolution E-4266, are unchanged and continue in full force and effect. This resolution only concerns the proposed amendments.

### Cost Reasonableness

In AL 3703-E, PG&E states that it followed the guidance of Resolution E-4199 in assessing the reasonableness of the Ivanpah amendments. Specifically, PG&E reviewed detailed cost models provided by BrightSource to determine if the higher price is justified for each facility. PG&E also re-evaluated the competitiveness of the Ivanpah PPAs compared to projects that PG&E shortlisted in its 2009 RPS solicitation. Lastly, the IE independently reviewed the project cost models and assessed the competitiveness of the Ivanpah PPAs at the higher amended price.

### **Independent Evaluator Review of the Amended PPAs**

The Commission requires the use of an IE when a utility negotiates a price increase to a Commission-approved RPS PPA. PG&E retained Lewis Hashimoto of Arroyo Seco Consulting to evaluate the fairness of the negotiations between the PG&E and BrightSource, to review the developer's cash flow models, and an assessment of the relative value of the amended Ivanpah PPAs compared to other RPS procurement opportunities available to PG&E.

AL 3703-E included a public and confidential IE report. In its report, the IE confirmed that PG&E negotiated the contract amendments fairly. The IE also performed detailed and independent analysis of the projects' cash flow models. While the IE was unable to validate all the cost inputs and assumptions for the projects, the IE concluded that the amended PPAs appear reasonable in light of the modifications that were necessary to facilitate permitting and financing. The IE also concluded that the all-in costs of the amended Ivanpah PPAs are

reasonable when compared to other RPS procurement opportunities including PG&E's most recently conducted RPS solicitation.

### **Project Viability**

In Resolution E-4266, the Commission approved the original Ivanpah PPAs, in part, because PG&E demonstrated that the projects were sufficiently viable. PG&E continues to believe the Ivanpah facilities are viable and will be developed according to the terms and conditions in the amended PPAs. The amendments reflect modifications that BrightSource has made to the Ivanpah 1 and Ivanpah 3 facilities to account for permitting the Ivanpah Solar Power Complex. With the CEC's issuance of the PMPD for the Ivanpah Solar Power Complex, BrightSource is well advanced towards having site control and permitting in place to proceed with the project.<sup>6</sup> The amendments will also facilitate BrightSource's financing of the Ivanpah projects, including receiving a DOE Loan Guarantee.

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<sup>6</sup> The Ivanpah site is on federal lands, which requires BrightSource to obtain a Right of Way from the Bureau of Land Management (BLM). The BLM's review is occurring concurrently with the CEC proceeding and develop the project. Information about the BLM's review process is available here:

[http://www.blm.gov/ca/st/en/fo/needles/nefo\\_nepa.html](http://www.blm.gov/ca/st/en/fo/needles/nefo_nepa.html)