

## Energy Storage Participants' Conference Q&A

December 18, 2014

### Program – General:

- 1) **What happens to deposits (1) if the bid is shortlisted and (2) if it is not shortlisted?**  
*Deposits are only required at the time bids are shortlisted. If the bid is not shortlisted, no deposit is required.*
- 2) **An initial slide showed a 10 MW target for 2014 for customer connected storage – will this be included in a separate RFO? What will be the likely size? How about the 2016, 2018, 2020 customer connected targets?**  
*The target for the 2014 customer connected energy storage will be met through existing customer side programs, such as SGIP.*

*The targets that the CPUC set for 2016 are 15 MW, 2018/25 MW and 2020/ 35 MW. These future targets are also expected to be met through current programs; we will see how it goes in the later years.*

*As noted below, we will consider Offers in this RFO from customer connected energy storage projects that can provide a distribution/ISO wholesale market service, such as Resource Adequacy (RA). If successful in this RFO, such an Offer would count towards meeting PG&E's transmission or distribution target, as applicable.*

### Eligibility:

- 3) **Does 4 MW, 4 hour storage mean that you are looking for the entire 4 MW facility to operate for 4 hours (or 4 MW/16 MWh) or is it a 4 MW facility running for 1 hour (or 4 MW/4 MWh)?**  
*Four MW, 4 hour storage means that 4 MW operating for 4 hours. That is a 16 MWh system.*
- 4) **Are there discharge capabilities that you prefer (example: long discharge, fast response, etc.)?**  
*No, there is no particular preference. You tell us the costs and capabilities, and we will compare the benefits.*
- 5) **Can you submit an ESA and RA agreement, or is it one or the other?**  
*You may submit both. They would be submitted as separate Offers.*
- 6) **Does an SBA Hub Zone company meet the supplier diversity requirement?**  
*For our compliance purposes, companies need to be registered with the CPUC diversity database.*
- 7) **Pumps in a flow battery move the reactants through the systems. This makes them an innate part of the energy storage architecture, like the uphill turbine of a pumped-hydro storage facility. The flow battery pump are not part of the system auxiliary components**

**that maintain suitable conditions, like lighting, HVAC, etc. So then, why would flow battery pumps be considered station power?**

*This is currently a topic in the CAISO Roadmap implementation. Our interpretation is based on what we think is out there now. That definition may change dependent on the results of the proceeding.*

**8) Please explain the reasons why PG&E is requiring a minimum of 10 MW for transmission level interconnection?**

*For this first ever Energy Storage RFO we have set 10 MW as the minimum for operational efficiency on our side.*

**Valuation:**

**9) How will PG&E assign a market value to Flexible Resource Adequacy?**

*PG&E uses its internal estimate of avoided cost of flexible Resource Adequacy (RA) capacity for each future delivery year, just like PG&E uses its internal estimate of avoided cost of system RA capacity to estimate the generic RA value.*

**10) What discount rate is used in NMV calculation?**

*7%, which is PG&E's After-tax Weighted Average Cost of Capital approved by CPUC.*

**11) How fast must a battery respond to qualify for Ancillary Services (A/S)?**

*The resource must be able to deliver the A/S Awards within 10 minutes. Additionally for Regulation, the resource must be able to receive AGC signals, which are in four-second intervals.*

*The CAISO Tariff has more information about Ancillary Services.*

<http://www.caiso.com/Participate/Pages/MarketProducts/AncillaryServices/Default.aspx>

**12) How is Dmax calculated? Are charge rate and discharge rate factored into it? If so, then how?**

*The seller specifies Dmax (Maximum Discharge Rate) as maximum steady state power (MW) that the system can discharge between 100% and 0% SOC (State of Charge), as measured by the Electric Revenue Meter at the Electrical Delivery Point.*

*The Charge rate factors similarly into Cmax (Maximum Charge Rate).*

**13) Shorter term agreements may increase the \$/kW-year price. Will PG&E consider this impact? How will PG&E evaluate the cost and benefits of contract terms?**

*We will take the net present value (NPV) of costs and benefits over the contract delivery term in our quantitative evaluation. Shorter term agreements may increase the \$/kw-yr price, but **may** reduce PG&E's customers' exposure in the NPV basis. Note that it is also possible that long-term agreements may be evaluated higher in the NPV basis depending on the benefits and costs of short-term and long-term agreements. PG&E does not have additional quantitative adjustment for the length of the contract terms. You are welcome to submit Offers with differing term lengths as long as the total number of submitted Offer variations does not exceed our limit of 5.*

**14) For customer connected storage Offers, could you elaborate on what additional or alternative information you will require in order to evaluate against grid-connected Offers?**

We will require proof/validation that the project can provide a distribution/ISO wholesale market service, such as Resource Adequacy (RA). Additionally, PG&E will need information to be able to determine NQC or EFC that such Offers can provide, if they want to be valued for RA or Flexible RA. Also if the project would be dispatchable by PG&E, we need information about the parameters and constraints for dispatch.

**15) Where does the energy storage system round-trip efficiency enter into the valuation since variable cost calculation was for “other than grid energy?”**

The cost of grid energy will be included in the Energy Value of the NMV (Net Market Value), and adjusts for round-trip efficiency.

**16) What if efficiency is better than the Guaranteed Efficiency?**

There is no contractual benefit to achieving an efficiency that is better than the Guaranteed Efficiency. We will consider the Guaranteed Efficiency in evaluating the offer, so, all else being equal, offers with better Guaranteed Efficiencies will outrank offers with poor Guaranteed Efficiencies.

**Interconnection:**

**17) It sounds as if selected bidders will need to show proof of application for interconnection prior to contract execution. However, shortlisted bidders are notified on April 24<sup>th</sup>. It then only leaves one week to apply for Cluster 8. Is it possible to adjust your shortlist date?**

Our shortlist date is a result of many factors, not just this RFO. At this time April 24 is the shortlist date.

**18) Some bidders will have Phase 1 interconnection studies back at the time of bid. Those studies will not have accurate estimates as the projects were not studied using an energy storage methodology. Will PG&E use the cost estimate numbers in the Phase 1 studies for analysis? If so, how?**

Yes, PG&E will use available cost estimates from Cluster 7 Phase I studies as part of the analysis both in terms of project viability and ratepayer impact from the reimbursable portion of your interconnection costs. If you have a Cluster 7 Phase I interconnection study you must submit it with your bid.

CAISO developed a framework through the recently concluded Energy Storage Interconnection initiative to accommodate storage under the existing interconnection tariff procedures. This framework has already been applied to Cluster 7 Phase I interconnection studies and will be applied similarly to Cluster 8 Interconnection Requests. The Cluster 7 Phase I interconnection studies do consider the charge and discharge modes of storage projects. Please review section 5 of the CAISO's [Draft Final Proposal](#) for more information.

- 19) If my company owns solar assets, and we are planning to add energy storage to an existing interconnection, what is the best way to get the energy storage addition added and approved for the existing interconnection? Assuming the best way for approval is via a material modification (MMA) with PG&E and CAISO, what is the timeline for submittal of this MMA, and also the timeline when the MMA could be approved?**

The CAISO's recently concluded Energy Storage Interconnection initiative clarifies the existing processes to modify a project to add storage. Please review section 5 of the CAISO's [Draft Final Proposal](#) for more information.

An MMA request to add storage must occur before the project's commercial online date (COD). However, there is also a post COD modification process and a process to repower an online project. Alternatively, a new Interconnection Request provides another opportunity to add storage. Differing approaches to add storage may work better for some projects than others. Please consult the CAISO [Generator Interconnection and Deliverability Allocation Procedures \(GIDAP\)](#) for more information.

**ESA:**

- 20) Are there locations you prefer for RA or ESA projects?**

We prefer projects in PG&E service territory, which is mainly north of Path 26.

We may look at local RA needs for PG&E.

Otherwise, in general, we will look at LMP prices, not just at the DLAP but also at the SLAP, so congestion may be a consideration depending on the timing of the congestion.

- 21) Regarding efficiency in the ESA, many storage systems will vary depending on usage. Must we guarantee a minimum efficiency even though actual efficiency could be better? Would the owner be compensated for better efficiency similar to the penalty for under efficiency?**

The Offer should specify operating assumptions and any operational limitations to enable a guaranteed monthly efficiency. There will be no compensation for actual efficiency that is better than guaranteed efficiency.

**PSA:**

- 22) Regarding the five PSA distribution deferral projects, do any of the distribution substations have land owned by PG&E which can be used for storage system installation? If it exists, can PG&E provide more details for each site?**

PG&E is not offering substation land (inside or outside of the substation) to sellers during this RFO cycle. The seller is responsible for securing the necessary site control for their proposed project.

- 23) Can a distribution deferral PSA project be sited in the PG&E substation? Can PG&E make site layouts of the substations available to RFO participants?**

No, PG&E is not offering substation land (inside or outside of the substation) to seller during this RFO cycle. The seller is responsible for securing the necessary real estate for the proposed project.

**24) Distribution Deferral Projects: Is it possible PG&E would shortlist two or more bidders using the same parcel of land?**

*Yes. PG&E could shortlist both projects. But as negotiations progress, the one that has affirmative site control will move forward.*

**25) Is there is any flexibility in the May 1, 2017 COD?**

*There will be delay damages if the guaranteed COD date is not met, calculated up to one year. If you pass beyond one year from the guaranteed COD date, PG&E has the right to terminate the contract,*

**26) Please provide more clarity on the payment schedule. In particular, what is implied by the closing date and would other milestone payment options be considered?**

*The PSA document has a definition for closing. Basically, closing means the project is constructed and operational and has passed the CAISO/commission testing.*

*We will not consider other milestone payment options.*

**27) For PG&E-owned energy storage at PV sites, is it correct that the storage will be on/within the PG&E owned site?**

*Yes, for the PV sites, PG&E land will be made available.*

**28) Who will be responsible, PG&E or the seller, for the RIG connection to CAISO?**

*For PG&E-owned energy storage at PV sites, the PV sites already have a RIG box in place at the sites, and we expect that the interconnection point would be the PV side of the RIG box.*

*At this time we are not sure if the interconnection process requires the RIG box to have some additional communication package.*

**29) Who will be responsible for environmental review/permitting?**

*Seller will be responsible for obtaining all permits.*

**30) How will price/cost be determined for license agreement for access?**

*No separate cost, but additional collateral to be posted and if everything is successful the collateral will be reimbursed.*

**31) Will an RFO participant need to apply for interconnection for the PV PSA projects?**

*Refer to the Presentation P37, Key Commercial Terms:*

- *seller will be responsible for all interconnection,*
- *PG&E will have sole authority for execution of any amendment or new contract relating to PV projects.*

**32) Will the PV site PSA look more like a turnkey EPC contract than a development agreement? It seems like PG&E is the developer and owner?**

*No it will not, we will provide a place for you to flange up to an existing asset, and then you will build and connect to that point.*

**33) Will PG&E provide available site dimensions/site layout for the PV PSA projects?**

*Site layout, in kmz file format, is included in the RFO documents.*

**34) Can we visit the sites to estimate installation costs?**

*If necessary, a site visit can be arranged. Do not just drive up to the site and expect to get access.*

**35) Does duty cycle at PG&E owned PV sites also include the one 50% cycle per day in addition to the one full cycle per day like in the distribution deferral PSA?**

*No, just one complete charge and discharge cycle.*

**36) Similar to the ESA, do we need site control at the time of bid for PSA?**

*No, but you need to identify the site.*

*Look in the posted PSA document Appendix F4-PSA, Distribution Deferral/Schedule 2.4/ Site Control, Milestone Table shows the site control requirement.*