

CPUC Energy Storage Proceeding A.14.02.006

**Staff Discussion Paper**  
**for Storage Workshop on June 2, 2014**

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## 1. Introduction

This Staff Discussion Paper addresses the topics proposed for further discussion at the June 2, 2014 Workshop to be hosted by Energy Division in response to requests by parties. The paper is intended as a thought piece to help parties consider various issues and nuances related to the topics as they prepare for the workshop. Please note that no part of this paper should be considered a Staff proposal or interpreted as offering Staff recommendations. The paper presents analysis, poses key questions for parties to contemplate, and in some cases describes potential responses and their implications for parties to consider.

It is suggested that parties review this paper in advance of the June 2<sup>nd</sup> workshop and come prepared to discuss the specific issues described here and provide their feedback. The goal of the workshop is to facilitate a robust, focused exchange of ideas, with the objective of reaching consensus where possible or simply sharing information that can inform the comments filed by parties in response to the ALJ scoping memo released on May 27, 2014.

## 2. Workshop Meeting Notice & Logistics

### Public Workshop Notice – IOU Energy Storage Procurement Issues

**June 2, 2014**  
9:30 am – 5 pm

*Hiram W. Johnson State Office Building  
Milton Marks Auditorium  
455 Golden Gate Avenue  
(Corner of Polk and Golden Gate Avenue)  
San Francisco, CA 94102*

*Please allow extra time to get through the security clearance in the lobby. There is no public Wi-Fi available in the auditorium.  
No RSVP or advance reservations are required to participate.*

**To participate online:**

Go to <https://van.webex.com/van/j.php?MTID=m812bd49243b83c7ff3ad40ac405c4513>

**Meeting Number:** 747 731 159

**Meeting Password:** storage

*No RSVP or advance reservations are required to participate.*

**To participate by phone:**

**Call-in:** 866-687-1443 (This will be a listen-only line)

**Participant passcode:** 1186966#

*No RSVP or advance reservations are required to participate.*

As directed in the PHC for the Energy Storage Procurement proceeding (A.14-02-006), the Energy Division will host a workshop on Monday June 2, 2014. The scope of the workshop includes: 1) energy storage definitions, 2) evaluation protocols, and 3) procurement/RFO requirements. Please check the “energy storage” page on CPUC website for workshop related materials (to be available by 5/29/14). Participation details are provided above. Please note that NO RSVP or advance reservations are required to participate.

### 3. Scoping Memo & Ruling

For procedural details relating to the proceeding (A.14-02-006), the commenting and the record development process and the role of this workshop within the proceeding, please refer to the “SCOPING MEMO AND RULING OF ASSIGNED COMMISSIONER AND ADMINISTRATIVE LAW JUDGE” issued on May 27, 2014. The memo can be found at this link:

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M091/K331/91331219.PDF>

### 4. Workshop Agenda

<b>0</b>	<b>Auditorium Available for Early Arrivals</b>	<b>9:00a</b>
1	Introduction – Energy Division	9:30
2	Energy Storage Definitions & Eligibility	10:00
<b>3</b>	<b>Lunch</b>	<b>Noon</b>
4	IOU RFO Requirements	1:00
5	IOU Bid Evaluation Protocols	3:00
7	Adjourn	5:00

## 5. Energy Storage Definitions & Eligibility

Some parties identified a need for the Storage Procurement proceeding to clarify the concept of energy storage applicable to the storage procurement program authorized by D.13.10.040. This section discusses some of the related issues and potential options. At the workshop during this segment, ED Staff will lead a discussion based on this content and parties should be prepared to provide their feedback as needed.

### 5.1 Definition per PUC

The Phase 1 Final Staff Report presented in R.10.12.007 (April 3, 2012) refers to the definition of energy storage systems provided in Assembly Bill (AB) 2514 (Stats. 2010, ch. 469), now PUC 2835. The applicable language is quoted below (reformatted for clarity):

- (1) “Energy storage system” means commercially available technology that is capable of absorbing energy, storing it for a period of time, and thereafter dispatching the energy. An “energy storage system”:
- may have any of the characteristics in paragraph (2),
  - shall accomplish one of the purposes in paragraph (3), and
  - shall meet at least one of the characteristics in paragraph (4)
- (2) An “energy storage system” may have any of the following characteristics:
- (A) Be either centralized or distributed.
- (B) Be either owned by
- a load-serving entity or local publicly owned electric utility,
  - a customer of a load-serving entity or local publicly owned electric utility, or
  - a third party, or
  - is jointly owned by two or more of the above.
- (3) An “energy storage system” shall be cost effective and either
- reduce emissions of greenhouse gases,
  - reduce demand for peak electrical generation,
  - defer or substitute for an investment in generation, transmission, or distribution assets, or
  - improve the reliable operation of the electrical transmission or distribution grid.
- (4) An “energy storage system” shall do one or more of the following:
- (A) Use mechanical, chemical, or thermal processes to store energy that was generated at one time for use at a later time.
- (B) Store thermal energy for direct use for heating or cooling at a later time in a manner that avoids the need to use electricity at that later time.
- (C) Use mechanical, chemical, or thermal processes to store energy generated from renewable resources for use at a later time.
- (D) Use mechanical, chemical, or thermal processes to store energy generated from mechanical processes that would otherwise be wasted for delivery at a later time.

## 5.2 Discussion

We highlight the several critical portions of the above definition that appear to be controlling in determination of whether an asset type is to be considered energy storage, and omit less critical language

(1) “Energy storage system” means **commercially available** technology that is capable of **absorbing energy, storing it** for a period of time, and thereafter **dispatching the energy**. An “energy storage system”:

- may have any of the characteristics in paragraph (2),
- shall accomplish one of the purposes in paragraph (3), and
- shall meet at least one of the characteristics in paragraph (4)

(2)...may be [centralized] [distributed] [different ownership models]

(3) ...shall [satisfy specified policy objectives]

(4) An “energy storage system” shall do one or more of the following:

(A) Use mechanical, chemical, or thermal processes to **store energy that was generated at one time for use at a later time**.

(B) Store **thermal energy for direct use for heating or cooling at a later time** in a manner that **avoids the need to use electricity** at that later time.

(C) Use mechanical, chemical, or thermal processes to **store energy generated from renewable resources for use at a later time**.

(D) Use mechanical, chemical, or thermal processes to **store energy generated from mechanical processes that would otherwise be wasted for delivery at a later time**.

### Part (1)

Part (1) of the above statutory definition indicates that a storage asset, besides being commercially available, must perform three specific functions:

- absorb energy
- store above energy
- dispatch above energy

But being able to perform all of these three functions is not a sufficient condition for an asset to be considered energy storage. In addition to the functional requirements, part (4) of the statutory definition indicates that a storage asset must have at least one of four specified characteristics.

### Part (4)

Each of the four specified characteristics is analyzed separately below.

1. The characteristic specified in part **4A** requires the storage asset to store energy via one of three specified processes (mechanical or chemical or thermal). Additionally, the energy being stored by the asset must be “**generated** at one time” for “**use** at a later time.”

- a. **Q1:** How should the term “generated” be interpreted?

In the energy context, “generation” generally means *conversion* of energy in one form into energy of another form. The conversion could be via a natural process (nuclear => solar via fusion, solar => chemical via photosynthesis, etc.) or via an artificial or man-made process or mechanism (solar => electricity via PV system, thermal => electricity via CT, chemical => electricity via diesel gen, chemical => thermal via furnace, etc.) Additionally, an even narrower interpretation could be applied to the concept of storing “generated energy” in 4A as limited to storing *specifically electrical* energy generated via a man-made mechanism connected to the electric grid.

**Q2:** For the purposes of storage targets, should the term “generated” be interpreted broadly (the conversion process could be natural or a man-made mechanism) or narrowly (specifically limited to a man-made mechanism only) or even more narrowly (specifically limited to electrical energy from a man-made mechanism)?

- i. If **broadly interpreted** (natural or man-made process), then this suggests that following examples should/could be considered energy storage applicable to the targets because they involve storage of energy generated via a natural process (in some cases, the natural process may be “assisted” by a man-made process, such as refinement of fossil fuel into diesel):

- CSP
- Biogas Plant
- Diesel Generator
- Biomass

- ii. If **narrowly interpreted** (man-made process only), then this suggests that the “storage” examples listed above should/could be disregarded as not applicable to storage targets. However, the following examples should/could be considered storage, notwithstanding other requirements.

- Off-grid battery connected to an off-grid PV system
- Rooftop solar thermal designed for household heating
- Thermal energy storage (TES) co-located with a thermal generator (charging from the output of the generator and not from the electric grid)

- iii. If **the narrowest interpretation** (electrical energy only from the grid) is applied, then this suggests that the examples listed above should/may not be considered storage applicable to the targets. However, the following examples should/could still be considered storage, notwithstanding other requirements.

- TES co-located with a thermal generator (charging from the grid)
- Grid-connected battery charging from the grid
- Backup battery charging from the grid
- Electric water heater
- Controlled charging of the EVs from the grid

b. **Q3:** How should the term “use” be interpreted?

A narrow interpretation of “use” could be that the stored energy must be used in some manner connected to the grid, as in used specifically to affect the state of the electric grid (directly supply energy to the grid, or reduce the load on the grid – directly or indirectly).

A broad interpretation of “use” could be that the stored energy is used to enable any useful activity or function.

**Q4:** For the purposes of the storage targets, should the term “use” be interpreted broadly (any activity) or narrowly (affect the state of the electric grid)?

- i. If **broadly interpreted**, then this suggests that following examples should/could be considered energy storage applicable to targets, notwithstanding other requirements:

- Off-grid battery connected to an off-grid PV system
- Backup battery charging from the grid, but discharging off the grid to support load (while the grid is down)
- Electric water heater
- Controlled charging of the EVs from the grid, but the stored energy is used off the grid for transportation (“V1G”)
- City buses running on EV batteries (but not buses running off electric lines)
- TES co-located with a thermal generator (charging from the output of the generator and not from the grid) and discharging to increase the output of the generator
- TES co-located with a thermal generator (charging from the grid) and discharging to increase the output of the grid

- ii. If **narrowly interpreted**, then this suggests that all of the above storage examples should/could be disregarded as not applicable to storage targets. However, the following examples, should/could still be considered storage applicable to the targets:

- EV battery charging from the grid and discharging into the grid (V2G) or to reduce onsite load



- TES charging from the grid and discharging to reduce cooling load on the grid
2. The characteristic specified in **4B** requires the storage asset to store thermal energy at one time specifically for the purpose of using it later for heating or cooling in such a way as to avoid the use of electricity at that later time. This is equivalent to stating that the stored energy is used to reduce the load on the grid normally associated with heating or cooling.

An example of this is TES used for permanent load shifting (PLS).

3. The characteristic specified in **4C** requires the storage asset to store energy (via any of the specified three means - which are same as in part 4A) specifically “generated” from a “renewable source” for “use” at a later time.
- a. The same analysis re the terms “generated” and “use” as already discussed for characteristic 4A could be applied here.
  - b. The term “renewable source” can of course be referenced back to PUC and PRC.

This characteristic suggests that the following examples should/could be considered storage applicable to the targets:

- Grid-connected battery **charging 100%** from an attached PV system and discharging into the grid or to reduce onsite load
  - Grid-connected battery **charging mostly** from an attached PV system (and sometimes from the grid ) and discharging into the grid or to reduce onsite load
  - Grid-connected battery **charging sometimes** from an attached PV system (but mostly from the grid) and discharging into the grid or to reduce onsite load
4. The characteristic specified in **4D** requires the asset to store energy (in any of the specified three means - which are same as in 4A) specifically “generated” from a “mechanical process” for use or “delivery” at a later time.

**Q5:** Should “delivery” be interpreted in a similar manner as “use” (as discussed in connection with characteristic 4A)?

An example of this characteristic could be the storing of energy “re-generated” from the braking action of a train.

Again, a storage asset must at least satisfy *one* of the above four characteristics.

## Other Conditions & Eligibility Criteria

**Q6:** Are there other conditions or requirements that should supplement the statutory definition that would need to be met by an asset to be considered energy storage applicable to the targets?

Examples of additional conditions could be:

- a. The discharge function of the asset must be controllable independently of and separate from the operation of another load or generator asset.
- b. The asset must be procured, built, or maintained primarily for:
  - i. Storing generated energy (per characteristic 4A, 4C, 4D) in one interval AND
  - ii. Discharging the stored energy to affect the state of the grid (as described under 1b of this section) in another interval.

**Q7:** Does the “commercially available” criterion, noted in PUC 2835, need to be clarified? If so, how?

**Q8:** Does the “viable” storage systems criterion, noted in PUC 2836, need to be clarified? If so, how?

It is not clear if the Commission needs to clarify these criteria or if the IOUs already have adequate precedence in their existing procurement practices for other resources or other guidance in the PUC or the Decision to apply these concepts to storage procurement.

In the Decision, the Commission referred to the storage market as “nascent” (p.25) and sought to achieve storage “market transformation” through the adoption of the “Energy Storage Procurement Framework” that “balances ratepayer protection with the promotion of new energy storage technologies” (p.42).

In this context, there is the question of how much “risk” the utilities should be willing to take on in procuring “new” storage technologies while being mindful of the potential impact on the ratebase. Some related issues that could be discussed are:

- Are there some types or elements of risk associated with new technologies that are appropriate for utilities and other risk factors that should be assumed by other entities (project developer / vendor, society, etc.)?
- What approaches should be considered for mitigating risks, ensuring project performance, and sharing rewards?
- To what extent should actual operational data and track record be a prerequisite for the storage technology to be considered for procurement?

## Summary

In summary, the two statutory requirements (perform the three functions in part (1) of PUC 2835 and satisfy one of the four characteristics in part (4) of PUC 2835) could be considered a minimum set of necessary conditions for an asset to be regarded as energy storage applicable to the targets (in addition to commercial availability and meeting policy objectives identified in Part 3 of PUC 2835).

If the **broadest interpretations** are selected, the implications in terms of which use cases should/could be considered energy storage applicable to the storage targets are shown in Table 1 on the next page.

**Table 1: Broad Interpretations**

Case	Use Case	ES?	AKA
1	CSP	Yes	Generator
2	Biogas plant	Yes	Generator
3	Diesel gen	Yes	Generator
4	Off-Grid Storage connected to off-grid PV	Yes	Non-grid asset
5	Rooftop solar thermal (household heating)	Yes	Non-grid asset
6	Hybrid thermal gen + TES	Yes	Enhanced Generator
7	Grid-connected battery charging from and discharging to the grid	Yes	Storage
8	Grid-connected <b>backup</b> battery (discharges only off-grid)	Yes	Load
9	Grid-connected <b>backup</b> battery (discharges <b>occasionally into</b> the grid)	Yes	Load
10	EV charging (stored energy used for transportation only – V1G)	Yes	Load modifier / DR
11	Electric water heaters	Yes	Load / DR
12	EV charging (storage energy discharges into the grid or to reduce onsite load – V2G)	Yes	Storage
13	TES for PLS	Yes	Storage
14	Grid-connected battery <b>charging 100%</b> from an attached PV system and discharging into the grid or to reduce onsite load	Yes	Enhanced Generator
15	Grid-connected battery <b>charging mostly</b> from an attached PV system (and sometimes from the grid) and discharging into the grid or to reduce onsite load	Yes	Enhanced Generator
16	Grid-connected battery <b>charging sometimes</b> from an attached PV system (but mostly from the grid) and discharging into the grid or to reduce onsite load	Yes	Storage
17	Absorb/store train's braking energy and discharge to grid	Yes	Storage
18	Pre-cooling	Yes	Load modifier / DR
19	Irrigation / water pumping (TOU)	Yes	Load mgt

If the **narrowest interpretations** discussed above are selected, along with one of the “other conditions” listed above, the statutory definition could be refined or supplemented with a consolidated set of requirements as described below.

- To be applicable to the storage procurement targets, an energy storage system shall:*
- 1) Absorb generated energy from the grid, a renewable energy source, or a mechanical process,  
AND*
  - 2) Store above energy:*
    - a) Via a mechanical, chemical, or thermal process, AND*
    - b) In an asset procured, built, or maintained primarily for:*
      - i) Function 1 (above) during some time interval, AND*
      - ii) Function 3 (below) in some other interval,  
AND*
  - 3) Discharge above energy to affect the state of the grid by:*
    - a) Directly supplying energy to the grid OR*
    - b) Directly or indirectly reducing the load on the grid*

The implications of the above set of requirements (associated with the narrowest set of interpretations discussed above) in terms of which use cases should/could be considered energy storage applicable to the storage targets are shown in Table 2 on next page.

**Q9:** Considering the range of interpretations discussed in this section, how should the statutory definition of energy storage be clarified or supplemented?

**Table 2: Narrow Interpretations**

Case	Use Case	ES?	Why?*	AKA
1	CSP	No	1	Generator
2	Biogas plant	No	1	Generator
3	Diesel gen	No	1	Generator
4	Off-Grid Storage connected to off-grid PV	No	3	Non-grid asset
5	Rooftop solar thermal (household heating)	No	3	Non-grid asset
6	Hybrid thermal gen + TES	No	3	Enhanced Generator
7	Grid-connected battery charging from and discharging to the grid	Yes		Storage
8	Grid-connected <b>backup</b> battery (discharges only off-grid)	No	3	Load
9	Grid-connected <b>backup</b> battery (discharges <b>occasionally into</b> the grid)	No	2b	Load
10	EV charging (stored energy used for transportation only – G2V)	No	3	Load modifier / DR
11	Electric water heaters	No	3	Load / DR
12	EV charging (storage energy discharges into the grid or to reduce onsite load – V2G)	Yes		Storage
13	TES for PLS	Yes		Storage
14	Grid-connected battery <b>charging 100%</b> from an attached PV system and discharging into the grid or to reduce onsite load	Yes		Enhanced Generator
15	Grid-connected battery <b>charging mostly</b> from an attached PV system (and sometimes from the grid) and discharging into the grid or to reduce onsite load	Yes		Enhanced Generator
16	Grid-connected battery <b>charging sometimes</b> from an attached PV system (but mostly from the grid) and discharging into the grid or to reduce onsite load	Yes		Storage
17	Absorb/store train's braking energy and discharge to grid	Yes		Storage
18	Pre-cooling	No	2b	Load mgt / DR
19	Irrigation / water pumping (TOU)	No	2b	Load mgt / DR

\*Entries in the “Why?” column indicate which requirement (among the three requirements listed in the narrow version of ES definition provided in the Summary section) a particular use case fails to meet.



## 6. Procurement/RFO Requirements

The IOUs have proposed specific RFO requirements in their storage procurement applications. These requirements are subject to change by the time the RFOs are issued in December. The requirements for each IOU are summarized in the tables below. Parties are requested to review the summary tables and provide feedback at the workshop on the following questions:

**Q10:** Should any of the RFO requirements be modified (if so, how) or set as fixed?

**Q11:** Are there any other requirements that should be added?

During this segment of the workshop, the format will be Staff-led interactive discussion and there will be ample opportunity for parties to seek clarifications from the IOUs on proposed requirements and offer constructive suggestions on how and why a requirement should be modified.

**Table 3.1**

Detail	SCE	SDG&E	PG&E
Location Requirements	<ul style="list-style-type: none"> <li>Market function: CAISO (including SCE system)</li> <li>Customer-side: SCE system</li> <li>T&amp;D deferral: SCE system</li> </ul>	<ul style="list-style-type: none"> <li>All domains: Within the SDG&amp;E local reliability area</li> </ul>	<ul style="list-style-type: none"> <li>Market function: CAISO (including PG&amp;E system)</li> <li>T&amp;D deferral: PG&amp;E system</li> <li>Customer-side: procured thru other methods</li> </ul>
Minimum Offer Size	<ul style="list-style-type: none"> <li>1MW for T- &amp; D-connected</li> <li>500kW for Customer-side (aggregated total)</li> </ul>	<ul style="list-style-type: none"> <li>None specified</li> </ul>	<ul style="list-style-type: none"> <li>10 MW for T-connected</li> <li>1 MW for D-connected</li> <li>Specific T&amp;D deferrals may specify smaller minimums</li> </ul>
Maximum Offer Size	<ul style="list-style-type: none"> <li>None specified</li> </ul>	<ul style="list-style-type: none"> <li>Transmission: <math>\leq 10</math> MW</li> <li>Distribution (CAISO): <math>\leq 2</math> MW;</li> <li>Distribution Reliability: <math>\leq 4</math> MW</li> </ul>	<ul style="list-style-type: none"> <li>None specified</li> </ul>
Functions Being Solicited	<ul style="list-style-type: none"> <li>Market function storage (e.g. participates in CAISO energy market, A/S, RA, etc)</li> <li>Customer-connected storage that provides load reduction</li> </ul>	<ul style="list-style-type: none"> <li><b>T&amp;D:</b> Market function ES (e.g. participates in CAISO energy market, A/S, Local RA, etc)</li> <li>D-reliability / power quality (for utility ownership)</li> </ul>	<ul style="list-style-type: none"> <li>Market function ES (e.g. participates in CAISO energy market, A/S, RA, etc)</li> <li>T and/or D system investment deferrals</li> </ul>
RFO Process	<ul style="list-style-type: none"> <li>Shortlist, then negotiate and execute with a subset of the short list.</li> <li>SCE <i>may</i> require price refresh</li> </ul>	<ul style="list-style-type: none"> <li>Shortlist, then negotiate and execute with a subset of list</li> <li>LTPP bi-lateral contracting authority may be used, but preference for RFO process</li> </ul>	<ul style="list-style-type: none"> <li>Shortlist, then negotiate and execute with a subset of list.</li> <li>Continuously competitive</li> </ul>

Table 3.2 (continued)

Detail	SCE	SDG&E	PG&E
Interconnection Requirements	<ul style="list-style-type: none"> <li>Interconnection study required by final offer submission</li> </ul>	<ul style="list-style-type: none"> <li>Flexible: network upgrade cost estimate may be included as a cap in the contract; must request FCDS</li> </ul>	<ul style="list-style-type: none"> <li>Interconnection application required by contract execution</li> </ul>
Points of Interconnection	<ul style="list-style-type: none"> <li>T-, D-, or Customer-connected</li> </ul>	<ul style="list-style-type: none"> <li>T&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>T- or D- connected</li> </ul>
Minimum Discharge Duration	<ul style="list-style-type: none"> <li>15 minute minimum</li> </ul>	<ul style="list-style-type: none"> <li>For CAISO market participation: 4 hours / 3 consecutive days</li> <li>D-Reliability &amp; pwr quality: none specified</li> </ul>	<ul style="list-style-type: none"> <li>15 minute minimum</li> </ul>
Contract Terms	<ul style="list-style-type: none"> <li>No minimum or maximum duration of contract</li> </ul>	<ul style="list-style-type: none"> <li>5 – 20 years</li> </ul>	<ul style="list-style-type: none"> <li>ESA: 10 years</li> <li>Amendment to existing Tolling Agreement with PG&amp;E: lesser of 10 years or remaining term of existing agreement</li> <li>RPS PPA: 20 years</li> <li>RA Confirm: 10 years.</li> </ul>
Contract Execution to Online Date	<ul style="list-style-type: none"> <li>Online by 2024 with a preference for Johanna-Santiago projects that are online within 4 yrs</li> </ul>	<ul style="list-style-type: none"> <li>Projects must be online no later than 2024</li> </ul>	<ul style="list-style-type: none"> <li>Projects must be online by 12/31/2024</li> </ul>
Site Control	<ul style="list-style-type: none"> <li>Not required for Indicative Offer, but necessary prior to of Final Offer</li> </ul>	<ul style="list-style-type: none"> <li>Not specified at this point, but will be when solicitation issued</li> </ul>	<ul style="list-style-type: none"> <li>Not required at time of bid but bid must identify a specific site.</li> </ul>

**Table 3.3 (continued)**

<b>Detail</b>	<b>SCE</b>	<b>SDG&amp;E</b>	<b>PG&amp;E</b>
Deposits	<ul style="list-style-type: none"> <li>• Bid Deposit: None</li> <li>• Shortlist Deposit: None</li> <li>• \$45/kW Delivery Date Security after execution</li> </ul>	<ul style="list-style-type: none"> <li>• Not specified at this point, but will be when solicitation issued</li> </ul>	<ul style="list-style-type: none"> <li>• Bid Deposit: None</li> <li>• Shortlist Deposit: \$3/kW</li> <li>• ESA Project Development Security: \$15/kW after execution; \$60/kW after CPUC approval</li> </ul>
New vs Existing Storage	<ul style="list-style-type: none"> <li>• Will consider any existing storage that was installed after Jan 1, 2010</li> </ul>	<ul style="list-style-type: none"> <li>• Will consider any storage projects that were installed after Jan 1, 2010</li> </ul>	<ul style="list-style-type: none"> <li>• Will consider any existing storage that was installed after Jan 1, 2010</li> </ul>
Earliest Delivery Date	<ul style="list-style-type: none"> <li>• January 1, 2017</li> </ul>	<ul style="list-style-type: none"> <li>• Not specified at this point, but will be when solicitation issued</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiable</li> </ul>
Contract type	<ul style="list-style-type: none"> <li>• Energy Storage Agreement</li> <li>• Behind-the-meter Agreement</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Storage System Tolling Agreement (wholesale market participation)</li> <li>• RA Confirm</li> </ul>	<ul style="list-style-type: none"> <li>• ES Agreement</li> <li>• Purchase and Sale Agreement Term Sheet</li> <li>• RPS PPA</li> <li>• RA Confirm</li> <li>• Existing PG&amp;E Agreement</li> </ul>
Other		<ul style="list-style-type: none"> <li>• Local &amp; flexible capacity requirements: meet RA counting rules</li> </ul>	



## 7. Evaluation Protocols

The IOUs are required by the Decision to conduct a least cost/best fit analysis on offers received in a solicitation. As directed, the IOUs have jointly -developed and -proposed a “consistent evaluation protocol” in their applications to be used for reporting and benchmarking purposes. In addition, the applications include a description of the proprietary evaluation protocol to be used for selecting the best bids for negotiations. Both evaluation protocols were also discussed by the IOUs at the March 14<sup>th</sup> Storage Workshop. At the upcoming workshop, parties are requested to provide feedback on the following questions:

**Q12:** Does the consistent evaluation protocol (CEP) need to be augmented? If so, how?

**Q13:** Is the quantification of benefits adequately addressed in the CEP and proprietary protocols? Specifically, should any of the following factors (or benefits) noted by parties in earlier comments be quantified in a better manner in the evaluation protocols? If so, how?

- GHG emissions reduction
- Avoided T&D
- Avoided water use
- Other project level benefits
- System/portfolio level benefits
- Other societal benefits

**Q14:** Should the standard for deferment of the biennial procurement target be clarified?

**Q15:** Should the deadline for requesting deferment of storage targets change from three months after the utilities’ receipt of RFO offers to a longer period (e.g., 12 months after the RFO offers have been shortlisted)?

During this segment of the workshop, selected parties will be given an opportunity to describe their concerns with the proposed protocols and how they could be modified. The IOUs will be given an opportunity to clarify/explain the protocols as needed and respond to suggested modifications.