

# Energy Storage Request for Offers

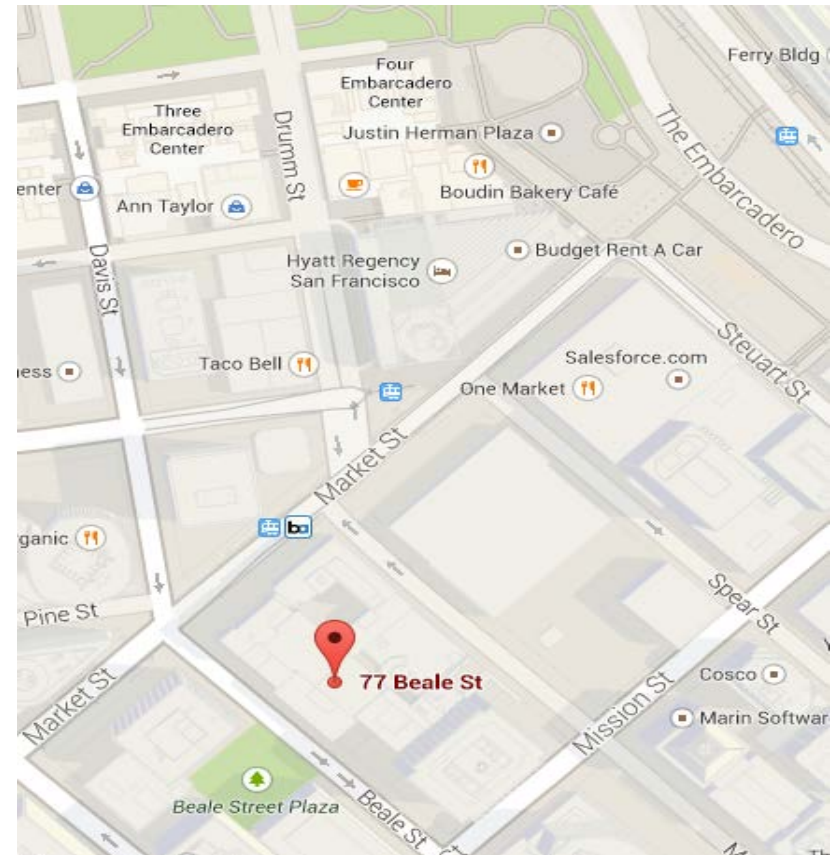
## 2014 SOLICITATION PARTICIPANTS' CONFERENCE

December 18, 2014 (updated 12/23/2014)

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# Safety First

- In case of emergency:  
**PG&E will dial** security at 223-3622;
- In case of evacuation:
  - Primary: Bechtel Plaza
  - Secondary: Justin Herman Plaza
  - **Use crosswalks**
- CPR/First Aid Certified



# Agenda

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## Topics

- Introduction
- Summary of CPUC's Energy Storage Decision
- Solicitation Overview
- ESA Overview
- PSA Overview
- Offer Submittal Process
- Evaluation Methodology
- Interconnection Information
- Keys to a Successful Bid
- Intermission
- Q & A

## Presenter

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Team

# Q&A / List of Attendees / Audio Replay

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- **PG&E will not take questions during the presentation.**
  - Please use the notecards provided to write down your questions and submit them to a PG&E representative.
- **Participants listening in should email questions to [EnergyStorage@pge.com](mailto:EnergyStorage@pge.com) during the presentation.**
  - Questions will be answered at the end of the presentation
  - PG&E might not address all questions during the Q&A portion of this conference
  - After the conference, PG&E will compile and post a Q&A document on PG&E's Energy Storage website, accessed via [www.pge.com/rfo](http://www.pge.com/rfo)
- **PG&E will post a list of attendees on PG&E's website. If you do not want your name or the name of your company published, please let us know by sending an email to [EnergyStorage@pge.com](mailto:EnergyStorage@pge.com) by December 19**
- **PG&E plans to post a recording of the presentation portion of the Webinar on PG&E's website (listed above)**

# Document Conflicts

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- This presentation is intended to provide a summary level discussion of the information and requirements established in the RFO materials
- Participants should carefully review the Energy Storage Solicitation Protocol and all RFO materials, available on PG&E's website: [www.pge.com/rfo/energystorage](http://www.pge.com/rfo/energystorage)
- To the extent that there are any inconsistencies between the information provided in this presentation and the requirements in the RFO materials, the RFO materials published on PG&E's website shall govern

# Summary of Energy Storage Decisions

In October 2013, CPUC issued Decision 13-10-040 on energy storage

- **Targets in 3 grid domains, or “buckets:”**  
(1) transmission, (2) distribution, and (3) customer side storage
- **Flexibility to shift 80% of MW targets between Transmission and Distribution domains**
- **Allows for target deferrals if projects are not cost-effective (up to 80%)**
- **Pumped hydro  $\geq$  50 MW is excluded**
- **Utility ownership should not exceed 50% of all storage across all 3 grid domains**
- **IOUs shall file procurement applications biennially (in 2014, 2016, 2018, and 2020)**

## Targets for PG&E

	2014	2016	2018	2020	Total
Transmission Connected (MW)	50	65	85	110	310
Distribution Connected (MW)	30	40	50	65	185
Customer Connected (MW)	10	15	25	35	85
Total (MW)	90	120	160	210	580

# Summary of Energy Storage Decisions

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- **CPUC decision D.14-10-035, which approved the IOU's Energy Storage Applications, became effective on October 22, 2014**
  - **PG&E is authorized to procure its Transmission- and Distribution-connected storage through this RFO**
  - **PG&E must submit agreements executed through the ES RFO for CPUC approval by December 1, 2015**
  - **The ES RFO is not an opportunity to procure new generation**
  - **PG&E is credited for 6 MW of existing energy storage batteries interconnected at distribution voltage**
  - **Adjusted targets for this RFO:**
    - **Transmission voltage: 50 MW**
    - **Distribution voltage: 24 MW**  
**74 MW**

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# Solicitation Overview



# RFO Schedule

DATE	EVENT
December 1, 2014	PG&E issued Energy Storage RFO and request for Notices of Intent (NOI) to bid
December 18, 2014	Participants' Conference
January 5, 2015	Deadline for NOI responses
January 15, 2015	Offer Form Webinar
February 17, 2015	Deadline for PG&E to receive Offers by 1:00 pm PPT (submitted via Power Advocate)
April 24, 2015	PG&E notifies Participants of their eligibility for Shortlist Negotiations
May 1, 2015	Participants notify PG&E whether they accept Shortlist position by 12:00 pm PPT
May – September 2015	PG&E and Participants negotiate Agreements
September – November 2015	Draft Application(s) for CPUC approval of executed Agreements
October 2015	Target for Agreement Execution
December 1, 2015	Deadline for PG&E to file Application(s) for approval of executed Agreements

# Independent Evaluator (“IE”)

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- **Primary role of the IE is to:**
  - **Monitor RFO processes to ensure fair and equal treatment of all Participants**
  - **Monitor evaluation processes to ensure PG&E has implemented methodology as described and that offers are treated consistently**
  - **Report on RFO and proposed transactions to CPUC when filed for CPUC approval**
- **The IE performs an independent review of all offers**
- **The IE may review all proposal data and monitor all negotiations of Agreements**
- **IE for the 2014 Energy Storage RFO is Wayne Oliver of Merrimack Energy Group**
  - **Copy Wayne Oliver on all correspondence at [waynejoliver@aol.com](mailto:waynejoliver@aol.com)**

# Energy Storage Agreement Types

	Contract Type	Configuration	Which Projects Will Use this Contract?
A	Energy Storage Agreement (ESA)		Projects connecting at the transmission or distribution level to the CAISO grid.
B	Resource Adequacy (RA) Confirmation		Projects that will provide RA products only
C	Amendment to Conventional PPA		ES projects co-located with existing natural gas facilities currently under contract with PG&E
D	Purchase and Sale Agreement (PSA)	Energy storage providing distribution deferral benefits (could be dual use)	Projects located near sites specified by PG&E, intended to defer distribution transformer upgrades for 10 years. These projects must be turnkey projects that are sold to PG&E once complete.
		Energy storage at PG&E owned PV sites	Projects located at PG&E-owned PV sites specified by PG&E. These projects must be turnkey projects that are sold to PG&E once complete and successfully tested.
		Stand-alone energy storage	Projects that would be developed entirely by a third party and would be sold to PG&E upon completion and successful testing.

# Key Solicitation Conditions

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- **PG&E will have a technology-neutral procurement approach.**
- **2014 Customer-connected ES targets have largely been met through existing CPUC programs.**
  - **However, PG&E will entertain customer-connected projects that wish to compete with T&D connected projects in this RFO.**
- **Energy Storage projects must meet at least 1 of the CPUC's 3 guiding principles:**
  - (1) Optimization of the grid**
  - (2) Integration of renewable energy**
  - (3) Reduction of greenhouse gas emissions**
- **Projects must be able to evidence a path toward completing site control, permitting, development, and if applicable, interconnection by the proposed online date. PG&E is not seeking technology-only or equipment-only offers.**

# Key Solicitation Requirements

Contract Type	Online Date	Minimum Offer Size*	Minimum Duration
Energy Storage Agreement (ESA)	By December 31, 2022	10 MW – Transmission 1 MW – Distribution	15 minutes
Amendment to Existing PPA			
PSA (Stand-Alone Storage)			
Resource Adequacy Confirmation	Same as ESA	Same as ESA	As then currently defined by the CPUC**
PSA (Distribution Deferral Sites)	Later of 2017 or 2018, as applicable, or 1 year after CPUC Approval	1 – 4 MW, depending on project site	2 – 4 hours, depending on project site
PSA (PG&E's PV Generation Sites)	Later of May 1, 2017 or 1 year after CPUC Approval	4 MW	4 Hours

\* Size is measured in terms of the “Design Dmax” of the Project, as defined in the relevant agreement

\*\*CPUC currently defines the Project’s Qualifying Capacity for RA as its ability to generate power over a continuous four hour period, for three consecutive days, or as modified per the CPUC.

# Key Solicitation Requirements

- **Minimum Size Requirements**
  - For transmission-connected projects, multiple ES resources can be aggregated in order to achieve the minimum project size for transmission interconnected offers, so long as:
    - (1) the aggregate Design Dmax is at least 10 MW,
    - (2) no single facility is less than 1 MW,
    - (3) the aggregate product has a single CAISO Resource ID,
    - (4) the aggregate product can be settled similar to having a single CAISO meter,
    - (5) the aggregate product has one Locational Marginal Price Node,
    - (6) the aggregate product complies with the CAISO Tariff, and
    - (7) the aggregate product is capable of being scheduled and dispatched by the CAISO or PG&E and optimized by PG&E as if the aggregated ES resources were one project, subject to the terms agreed upon by the Participant and PG&E.
- **Delivery Term for 3<sup>rd</sup> Party-owned Agreements**
  - ESA and RA Confirm – no maximum, but prefer Delivery Terms 10 years or less, due to limited experience with storage technologies at this point.
  - ESA or Amendment to Conventional PPA – For storage projects co-located with existing RPS or conventional facilities, up to the remaining Delivery Term under the existing contract.

# Key Solicitation Requirements

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- **Site Control**
  - Site control not required, but Participant must have exact site identified and must be on track to obtaining site control.
- **Interconnection Status**
  - No interconnection study required at the time of Offer submission.
    - However, Participants must have submitted their application for an interconnection study by execution of an Agreement (except distribution deferral PSAs).
    - For projects that must be studied via a cluster process:
      - CAISO's transmission interconnection application cluster window closes on April 30, 2015
      - PG&E's wholesale distribution cluster window closes on March 31, 2015
    - For distribution deferral PSAs, no WDT interconnection study required by Participant
- Participants offering a PSA for a Stand-Alone energy storage project must also offer an ESA for that same project

# Key Solicitation Requirements

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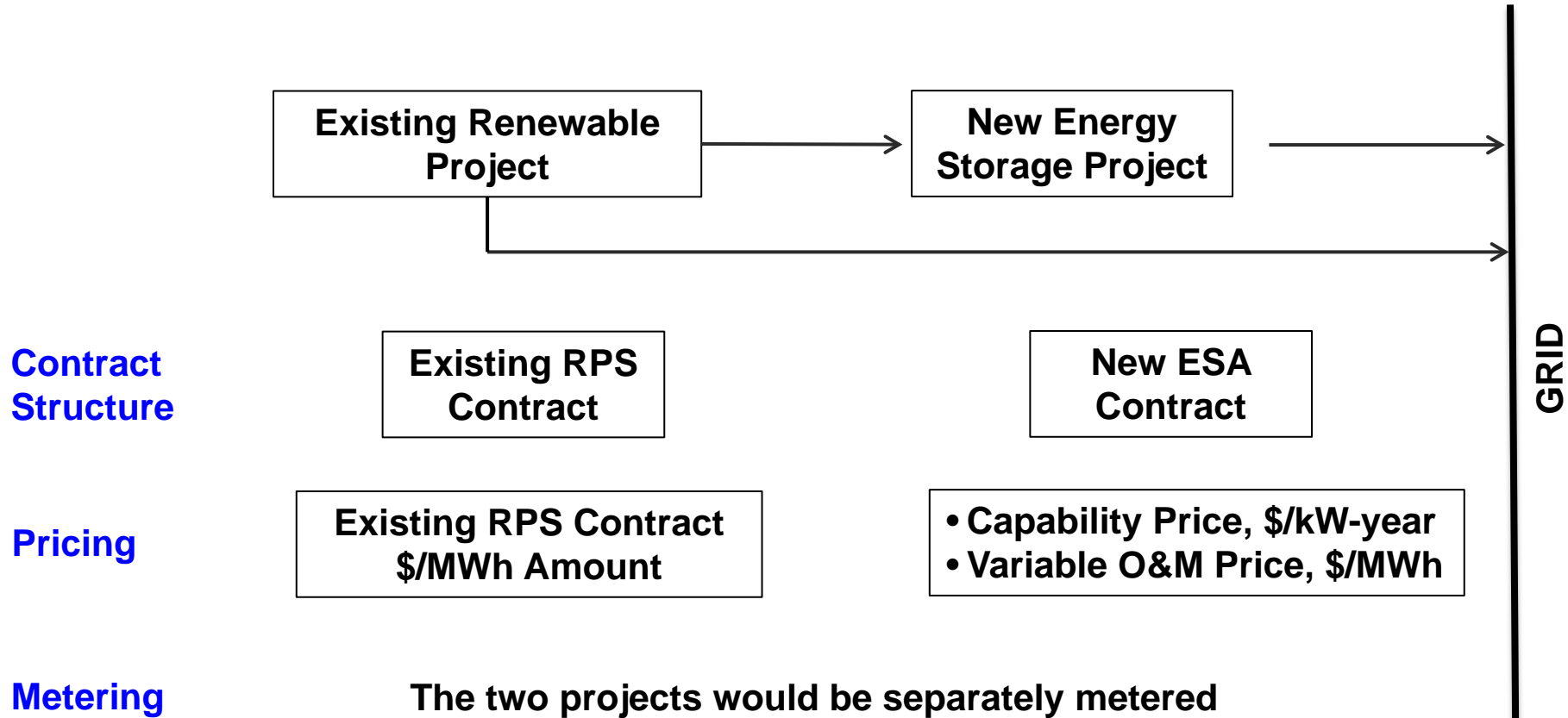
- **Site Control**
  - **Participants planning to offer energy storage projects co-located with existing renewable or conventional generation resources currently under contract with PG&E should contact PG&E in advance of making the offer**
    - **Send an e-mail to the energy storage mailbox, [EnergyStorage@pge.com](mailto:EnergyStorage@pge.com), with a copy to the Independent Evaluator at [waynejoliver@aol.com](mailto:waynejoliver@aol.com). Also copy the PG&E contract manager for your current contract.**
    - **The e-mail should include information on your current contract, your proposed energy storage project size, charging source(s), operating characteristics, site layout and metering arrangement.**



# Key Performance and Operational Requirements

- **Minimum discharge duration requirements**
- **Wholesale market resources**
  - **Must directly interconnect into the CAISO or applicable distribution provider**
  - **Must have a single exclusive CAISO Resource ID**
  - **Must have a single dedicated CAISO-approved meter located on the high side of a step-up transformer that is dedicated solely to the project**
  - **Must be able to respond to the electronic signals of PG&E, third-party Scheduling Coordinator, or CAISO systems (e.g., SCADA, AGC)**
  - **If Participant's Offer includes Resource Adequacy (RA) as part of the Product, then the Project must meet the applicable CPUC requirements for duration and CAISO requirements for deliverability as well as any other requirements**
- **Except for RA-only Products, PG&E requires Offers in which PG&E is the sole off-taker of the Products from the Project.**
- **Specific operating flexibility or constraints must be defined by the Participant.**

# Example of Co-Located RPS and Storage



# Key Solicitation Requirements

## Credit/Collateral Requirements for PSAs

Contract Options	PSA (Distribution Deferral Sites)	PSA (PG&E's PV Generation Sites)	PSA (Stand-Alone Energy Storage)
<b>Pre-Commercial Operation Date (COD)</b>			
Project Development Security ("PDS")	\$15/kW at Execution, and 10% of purchase price at CPUC Approval	\$15/kW at Execution; and at least an additional \$45/kW plus \$x – for security for license for potential dismantling/de-commissioning, at CPUC Approval plus \$x – if upgrades or other modifications needed to be paid to Distribution Provider	\$15/kW at Execution, and an additional \$45/kW at CPUC Approval
<b>Post-COD</b>			
Delivery Term Security ("DTS")	N/A	N/A	N/A
Post Closing Collateral for Performance and Warranty Periods	10% of the purchase price plus an acceptable warranty by an issuer acceptable to PG&E	10% of the purchase price plus an acceptable warranty by an issuer acceptable to PG&E	10% of the purchase price plus an acceptable warranty by an issuer acceptable to PG&E

# Key Solicitation Requirements

## Credit/Collateral Requirements for non-PSAs

Contract Options	Energy Storage Agreement	Amendments to Existing Power Purchase Agreements	Resource Adequacy Confirmation
<b>Pre-Commercial Operation Date (DOC)</b>			
<b>Project Development Security (“PDS”)</b>	<b>\$15/kW at Execution, and an additional \$45/kW at CPUC Approval (total posted PDS of \$60/kW)</b>	<b>\$15/kW at Execution and an additional \$45/kW at CPUC Approval (this PDS requirement is for the energy storage portion only)</b>	<b>\$15/kW at Execution, and an additional \$45/kW at CPUC Approval (total posted PDS of \$60/kW)</b>
<b>Post-COD</b>			
<b>Delivery Term Security (“DTS”)</b>	<b>\$125/kW or 10% of monthly fixed payments up to 3 years, whichever is higher</b>	<b>\$125/kW or 10% of monthly fixed payments up to 3 years, whichever is higher (this DTS requirement is for the energy storage portion only)</b>	<b>\$125/kW or 10% of monthly fixed payments up to 3 years, whichever is higher</b>
<b>Post Closing Collateral for Performance and Warranty Periods</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

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# ESA Overview

# Energy Storage Agreement

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- **Energy Storage Agreement is designed for stand-alone storage projects that are interconnected to the CAISO grid**
  - **Point of delivery is at the CAISO grid**
- **It is technology neutral—please include any technology-specific modifications necessary in the term sheet**
- **Projects must be designed to offer PG&E full dispatch and charging rights**
  - **Use Resource Adequacy confirm for other offers**
- **Projects providing Resource Adequacy must be fully deliverable by the Initial Delivery Date**

# Product and Attributes

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- **Read definitions carefully!**
- **PG&E is buying Energy Storage Services, which encompasses the project's ability to:**
  - Charge energy
  - Store energy
  - Discharge energy
- **Seller conveys to PG&E the exclusive rights to all Product (i.e. Energy, Ancillary Services, Other Products, Capacity Attributes)**
- **PG&E is interested in knowing the full shape of the charging and discharging cycle, from 100% State of Charge to 0% State of Charge, which may include curtailment in charge and discharge rates as the projects approach 100%/ 0% State of Charge**

# Compensation

- **“Tolling” arrangement, whereby PG&E will provide the Charging Energy, which the Project will store and make available for later discharge**
  - **Charging Energy does not include Station Use, which must be separately metered**
  - **Seller is responsible for all costs other than Charging Energy**
- **Compensation**
  - **Monthly Fixed Payment, (\$/kw-year)**
  - **Monthly Variable Payment, (\$/MWh) based on Project’s variable costs**
- **Monthly Fixed Payments may be reduced based on different performance factors**
  - **Availability to charge, store, and discharge energy at the contractual rates**
  - **Availability to providing Product other than Energy, such as A/S**
  - **Guaranteed Efficiency—actual efficiency compared to its guaranteed efficiency**
- **Seller will also be responsible for costs associated with deviations from PG&E’s Schedule**



# Dispatch

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- **PG&E has the right to bid and schedule the Project at all times across all CAISO markets**
  - **Seller will need to install communications systems per PG&E's specifications**
- **PG&E will be Scheduling Coordinator after Initial Delivery Date**
  - **Seller will provide notices of availability of the Project's capability to charge, store, and discharge energy and the availability of Other Product**
- **Projects are considered unavailable during outages, except to the extent the outage is an Excused Scheduled Maintenance Outage or due to a Force Majeure event**

# Term and Conditions Precedent

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- **Seller will specify an Expected Initial Delivery Date (EIDD)**
  - Delay beyond EIDD will be subject to damages of \$160/MW/day, unless such delay is caused by Force Majeure
  - PG&E has right to terminate if delay extends beyond one year
- **CPUC Approval**
  - Must be obtained for the Agreement to be effective; parties have mutual right to terminate if not obtained by one year after filing
- **Initial Delivery Date occurs only after satisfaction of certain Conditions Precedent (the following list is not exhaustive):**
  - Interconnection Facilities and Electric System Upgrades complete for full charging and discharging
  - CAISO Commercial Operation Date (COD) and Project COD have been achieved
  - All systems in place to allow PG&E to fully bid, schedule, and settle
  - All CAISO agreements in place
  - All certifications for Product are in place

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# Amendment to Existing Agreements for the Addition of Energy Storage

# Amendment to Existing Agreements – Eligibility Requirements

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- **If the project charges from the existing resource, PG&E and a Participant may execute an amendment to the existing agreement**
  - **If the project charges from the grid or can be separated from the existing resource then this would be considered a stand-alone energy storage resource that would execute an ESA**
- **Offers must be with an existing resource currently under contract to PG&E**
  - **Per the CPUC Decision, the RFO is not an opportunity to offer new generation**
- **Contract term for the Offer could only be up to the remaining term of the existing agreement**
  - **The RFO is not an opportunity to extend the term of the existing agreement**
- **Participants should not make any material modifications to the existing agreement**



# RA Confirm

# RA Confirm – Eligibility Requirements

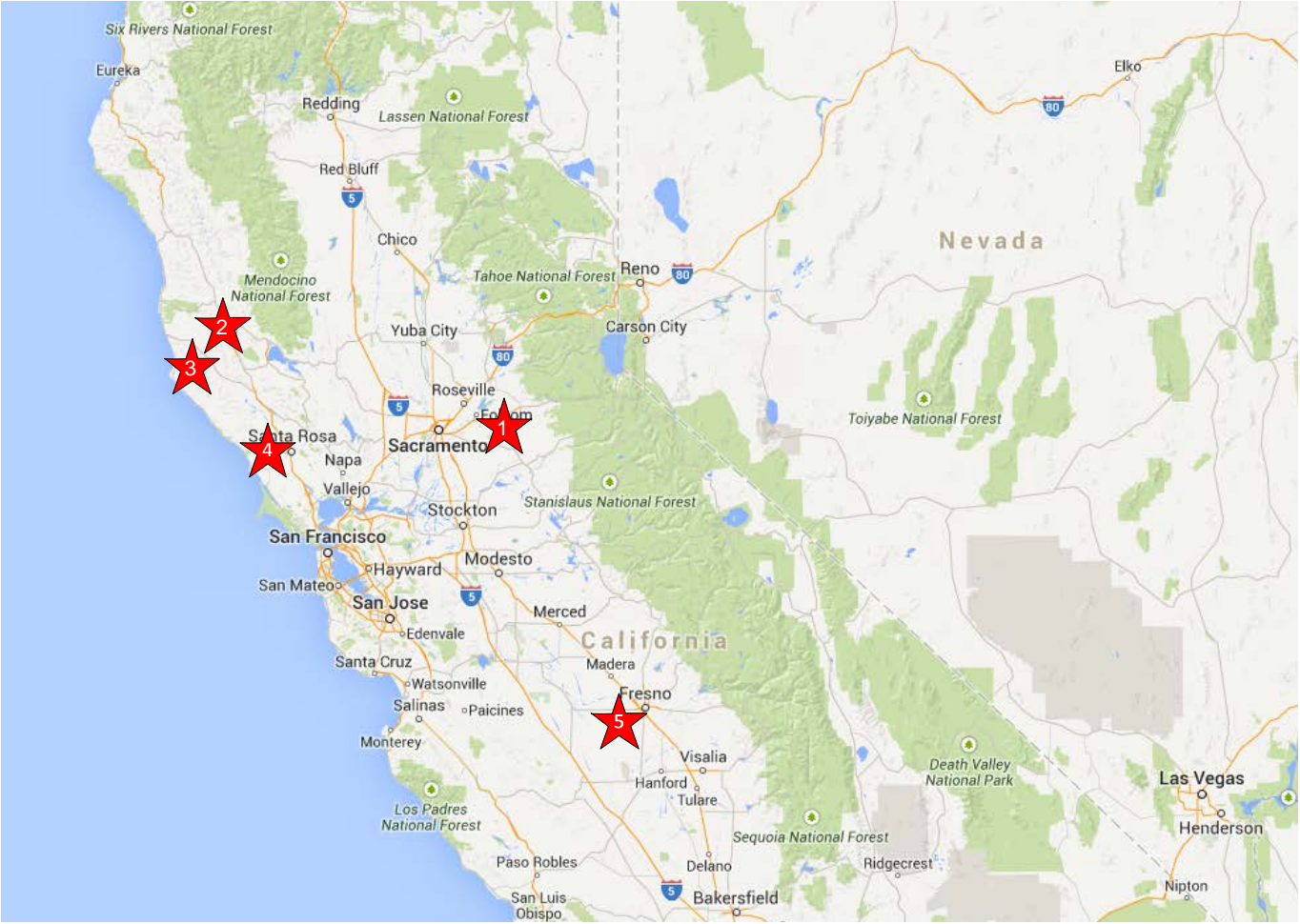
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- **Participants must meet the applicable CPUC requirements for duration and CAISO requirements for deliverability as well as any other requirements that will enable PG&E to receive all of the RA benefits associated with the Project.**
- **Project must be able to deliver RA by the start of the contract term. Payment is based on the RA the project delivers.**
- **RA confirm will be further modified to reflect Project characteristics.**
- **Must have a EEI Master Agreement with PG&E in place prior to executing an RA Confirm**

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# PSA Overview for 5 Distribution Deferral Projects

# PSA – Distribution Deferral Project Locations



- 1 - Shingle Springs
- 2 - Mendocino
- 3 - Point Arena
- 4 - Molino
- 5 - Old Kearney

Overall Substation Location Map



# PSA:

## Distribution Deferral Project Requirements

Distribution Substation*	Guaranteed Dmax (MW) at Year 1-10	Guaranteed Discharge Duration (hours)	Guaranteed Site Specific Required Duty Cycle	Guaranteed Commercial Operation Date (later of)
Shingle Springs – Bank #2 Cameron Park, CA 95682	4	4	1/day for up to 365 days/year	May 1, 2017, or 12 months after CPUC approval
Mendocino – Bank #2 Redwood Valley, CA 94570	1	2	1/day for up to 365 days/year	May 1, 2018, or 12 months after CPUC approval
Point Arena – Bank #1 Point Arena, CA 95468	1	2	1/day for up to 365 days/year	May 1, 2017, or 12 months after CPUC approval
Molino – Bank #1 Sebastopol, CA 95472	1	2	1/day for up to 365 days/year	May 1, 2017, or 12 months after CPUC approval
Old Kearney – Bank #3 Fresno, CA 93706	1	2	1/day for up to 365 days/year	May 1, 2018, or 12 months after CPUC approval

\*The Project may be near the vicinity of the distribution substations or near the main line of the distribution feeder(s) that is connected to the specified substation transformer bank.

# PSA (Deferral Sites) - Key Commercial Terms

<b>Asset</b>	<b>An energy storage system including all assets to interconnect into and to support the PG&amp;E Distribution System (“Project”) in order to defer certain substation capacity asset investments.</b>
<b>Storage Technology</b>	<b>No specific storage technology.</b>
<b>Contract Structure</b>	<b>Purchase and Sale Agreement (PSA). Seller develops, constructs, tests and commissions the Project in utility commercial operation by the Guaranteed Commercial Operation Date (GCOD) in accordance with PSA standards.</b>
<b>Other Performance Guarantees</b>	<b>Bidder will provide additional operating characteristics to the minimum performance requirements listed in previous slides.</b>
<b>Payment Schedule</b>	<p><b>If Project meets minimum performance guarantees by certain dates and other PSA requirements, PG&amp;E will pay</b></p> <ol style="list-style-type: none"> <li><b>1) At Closing- 90% of Purchase Price as reduced by results of Performance Tests less amount for punchlist items.</b></li> <li><b>2) At Project Completion - remaining amount of initial 90% less any withheld for work not completed.</b></li> <li><b>3) No later than 2 years after Closing- 10% of Purchase Price as reduced by results of Performance Tests.</b></li> </ol>

# PSA (Deferral Sites) - Key Commercial Terms (continued)

<b>Project Milestones</b>	The PSA will include project development milestones site control, permitting, interconnection, financing, mechanical completion, and substantial completion.
<b>Grid Interconnection</b>	Seller will enter into a separate agreement with PG&E Distribution. Seller is responsible for costs.
<b>Delay Damages and Termination Fees</b>	Please refer to PSA for specifics.
<b>Maintenance Agreement</b>	Seller must complete a term sheet for ten (10) year maintenance contract that specifies costs as well as forecast of planned and forced outages.
<b>PG&amp;E review of EPC and documents</b>	<ul style="list-style-type: none"> <li>• PG&amp;E will have the right to approve Seller's EPC contract and certain contract documents.</li> <li>• PG&amp;E will review project documents and schedules.</li> <li>• Seller must provide PG&amp;E with access to all Project Assets and with rights to witness and inspect including the manufacture of major equipment components.</li> </ul>
<b>Warranties</b>	Seller to provide warranties as required in PSA.
<b>Summary Comments</b>	Please refer to RFO Appendix F7 for comments to PSA. Please focus on items that are critical for financing or other requirements to develop, construct and commission the Project.

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# PSA Overview for Projects at 3 PG&E-Owned PV Sites

# PSA - PG&E PV Site Requirements

Site	Nominal Voltage At Connection Point (See Note 1 Below)	Guaranteed Dmax (MW) at Year 1- 10 (See Note 2 Below)	Guaranteed Discharge Duration (hours)	Guaranteed Site Specific Required Duty Cycle
Guernsey 21024 10-1/2 Avenue Hanford, Ca. 93234	12.47kVAC	4MW	4	1 full discharge and charge per day, for 365 days per year for minimum of 10 years
Huron Corner of West Gale Avenue and South Lassen Ave (Hwy 269), Huron, Ca. 93234	12.47kVAC	4MW	4	1 full discharge and charge per day, for 365 days per year for minimum of 10 years
Stroud W. Kamm Ave west of S. Lassen Ave (Hwy 145), Helm, Ca.	12.47kVAC	4MW	4	1 full discharge and charge per day, for 365 days per year for minimum of 10 years

**Notes:**

1. The voltages listed are nominal only.

A. The equipment connected to the 12.47kVAC bus shall be at least 15kV class equipment, typical voltage range is from 0VAC to 13.8kVAC.

2. These values are minimum total output power for the Energy Storage Systems (ESS) at each site. Dmax of 4 megawatts is the minimum output for duration of 4 hours. This system should consist of a modular system made up of smaller units (say 500kW or 1 MW) in parallel to give the total of 4 megawatts.

# PSA (PG&E PV Sites) - Key Commercial Terms

<b>Asset</b>	<p>An energy storage system including all assets to interconnect to certain existing PV sites to provide storage services (“Project”).</p>
<b>Storage Technology</b>	<p>No specific storage technology.</p>
<b>Contract Structure</b>	<p>Purchase and Sale Agreement (PSA). Seller develops, constructs, tests and commissions the Project by the Guaranteed Commercial Operation Date (GCOD) in accordance with PSA standards.</p> <p>Seller will enter into License Agreement for use of PG&amp;E’s land.</p>
<b>Additional Performance Guarantees</b>	<p>Bidder will provide additional operating characteristics to the minimum performance requirements listed in previous slides.</p>
<b>Payment Schedule</b>	<p>If the Project meets the minimum performance guarantees by certain dates and other PSA requirements, then PG&amp;E will pay:</p> <ul style="list-style-type: none"> <li>• At Closing- 90% of Purchase Price as reduced by results of Performance Tests less amount for punchlist items.</li> <li>• At Project Completion- remaining amount of initial 90% less any withheld for work not completed.</li> <li>• No later than 2 years after Closing- 10% of Purchase Price as reduced by results of Performance Tests.</li> </ul>

# PSA (PG&E PV Sites) - Key Commercial Terms

<b>Project Milestones</b>	<b>The PSA will include project development milestones including permitting, interconnection, financing, mechanical completion and substantial completion.</b>
<b>Grid Interconnection</b>	<b>Seller will be responsible for all interconnection. PG&amp;E will have sole authority for execution of any amendment or new contract relating to PV projects.</b>
<b>Delay Damages /Termination Fees</b>	<b>Please refer to PSA for specific amounts.</b>
<b>Maintenance Agreement</b>	<b>Seller must complete a term sheet for ten (10) year maintenance contract that specifies costs as well as forecast of outages.</b>
<b>PG&amp;E review of EPC and documents</b>	<ul style="list-style-type: none"> <li><b>PG&amp;E has the right to approve Seller's EPC contract and certain documents. PG&amp;E will review other project documents and schedules.</b></li> <li><b>Seller must provide PG&amp;E with access to all Project Assets and with rights to witness and inspect including the manufacture of major equipment components.</b></li> </ul>
<b>Warranties</b>	<b>Seller to provide warranties as required in PSA.</b>
<b>Comments</b>	<b>Refer to RFO Appendix F7 for comments to PSA. Please focus on items that are critical to develop, construct and commission the Project.</b>

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# PSA stand-alone



# PSA Stand-alone

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- **Participants who are providing offers for an ESA may provide an alternative offer for a fully permitted and constructed ES System.**
- **All projects must be located in PG&E's service territory and interconnected to PG&E's Transmission or Distribution System. Please note that all parameters below must match the bid offer for the ESA equivalent.**
- **Participants submitting Summary Sheet in Appendix F7 should be prepared to provide a complete markup of Appendix F7, PSA Summary Sheet with modifications to the Electric Interconnection, Performance Guarantees, Warranty, Electrical Interconnection Facilities exhibit, General Facility Description exhibit, Storage Operational Characteristics and Limitations exhibit, and any other provisions or exhibits that require modification due to the proposed technology or location of the facility.**

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# Offer Submittal Process

# Website and Communications

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- The Energy Storage RFO website (select “2014 Energy Storage RFO” link at [www.pge.com/rfo](http://www.pge.com/rfo)) includes everything you need to submit for an offer, including but not limited to:
  - RFO documents
  - Detailed instructions for submitting offer(s) through Power Advocate
  - Announcements, updates, and Q&A
- All communications should be directed to: [EnergyStorage@pge.com](mailto:EnergyStorage@pge.com), with a copy to the Independent Evaluator at [waynejoliver@aol.com](mailto:waynejoliver@aol.com)

# Offers and Variations Allowed Per Participant

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- Participants may submit up to twelve (12) Offers
  - An Offer is defined as a specific Project at a particular location, using one type of technology, and under a specific agreement type
  - Varying these attributes are substantial changes and are considered a new Offer
- Participants may submit up to five (5) variations of each offer, including the base offer (i.e., base offer plus 4 variations).
  - A variation may alter attributes such as delivery term, price, commercial operation date, capacity, duration, or other operational characteristics such as ramp rate

# Offer Submittal Process

- Offers must be submitted via the online platform Power Advocate.
  - In order to submit an Offer, participants *must first pre-register* with Power Advocate, at:  
<https://www.poweradvocate.com/pR.do?okey=46155&pubEvent=true>
  - PG&E strongly encourages you to register well in advance of Offer due dates.
- Detailed instructions for submitting offer(s) and using Power Advocate are available on PG&E’s website [www.pge.com/rfo](http://www.pge.com/rfo) under “2014 Energy Storage RFO.”
- Offer package must contain all required information, and must be organized as described in the Solicitation Protocol Section VI.D, Required Information.
- PG&E will consider submitted Offers that, as of the submittal deadline (February 17, 2014 by 1:00 PM PPT), are complete and conforming Offers
- Failure to respond to inquiries by PG&E regarding incomplete or incorrect information could result in disqualification for the RFO
- By submitting an Offer in this RFO, each Participant is required to abide by the confidentiality obligations specified in Section IX of the Solicitation Protocol and by selecting “Yes” in the Acknowledgements and Authorizations section of the Developer Experience tab of the Offer Form.

# Offer Submittal

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## **Complete Energy Storage Offer Package (by February 17, 2015 by 1:00 PM PPT)**

- **Introductory Letter**
- **Appendix A: Offer Form (excel)**
- **Appendix B1: Project Description**
- **Appendix B2: Site Control**
- **Appendix B3: Project Milestone Schedule**
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- **Appendix D: Confidentiality Agreement**
- **Appendix F1b – F7: Relevant Term or Summary Sheet for Agreement**

## **Post-Shortlist Documents (by May 8, 2015 by 5:00 PM PPT)**

- **Appendix F or Existing Agreement: Redline of relevant Agreement**
- **Appendix G1: Letter of Credit (if applicable)**
- **Appendix G2: Request for Taxpayer ID Form (if applicable)**
- **Interconnection Application**

# Offer Form Overview

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- Be sure to enable macros when opening the offer form
- Instructions tab provides clear directions on completing the offer form
- Instructions tab identifies required tabs to be filled in by Participants
- Please make sure you submit an Excel form. No other formats will be accepted
- Each cell with a light yellow background must be filled in. Once completed the light yellow background will disappear
- Red triangular tab indicates that help captions are available when you position your mouse over the field
- Grayed out cells are auto-calculated cells
- The word “complete” will appear at the top of the page when the required cells are filled in
- PG&E will host a Participant’s Offer Form Webinar on January 15, 2015
  - Participants should try out the Offer Form prior to the Webinar

# Offer Price Assumptions

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The price that Participant submits in the Offer must assume the following:

- **Grid Interconnection Costs**
  - **Direct Assignment Costs**: Seller bears the Direct Assignment Costs because there is no reimbursement of these costs to Seller.
  - **Network Upgrades**: Seller bears the cost of financing the Reliability Network Upgrades<sup>1</sup> for Energy Only projects. If a Seller submits its project as fully deliverable, the Seller must also fund any upgrades required to achieve Full Capacity Deliverability Status<sup>1</sup>.
- **Collateral Requirements**
  - **Factor in costs, if any, to provide Project Development Security and Delivery Term Security**

<sup>1</sup> Developer is entitled to repayment of some or all upgrade costs with interest over a 5-year period following initial operation.



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# Evaluation Methodology

# Evaluation Methodology

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- **QUANTITATIVE CRITERIA**
  - Net Market Value
  - Portfolio Adjusted Value
- **QUALITATIVE CRITERIA**
  - Project Viability
  - Supplier Diversity
  - Credit
  - Technology Diversity
  - On-line Date Diversity
  - Contract Modifications
  - Counterparty Concentration
  - Safety

# Net Market Value (1)

Net (Present) Market Value =  $(E + A + C) - (V + F) = \text{Benefits} - \text{Costs}$

- **E = Energy value** is based on the market value of the energy deliveries for each offer based on price scenarios at Project's location and charging/discharging time series over the offer's delivery term
- **A = Ancillary Services (A/S) value** is based on Offer's co-optimized Ancillary Services time series
  - Spin and Reg Up/Down in a limited-depth market
- **C = Capacity value** is based on
  - Offer's contribution to meeting PG&E's future Resource Adequacy requirements
  - Projected monthly quantity of Net Qualifying Capacity for Generic RA, and Effective Flexible Capacity for Flexible RA. See CPUC decision 14-06-050 re: EFC referenced in offer form

# Net Market Value (2)

Net (Present) Market Value =  $(E + A + C) - (V + F) = \text{Benefits} - \text{Costs}$

- V = Variable Cost is based on
  - Variable Operations and Maintenance (O&M) cost multiplied by the offer's discharge time series
  - Cost of fuel (other than grid energy) and/or start-up costs, if applicable.
- F = Fixed Cost is based on
  - Sum of projected monthly fixed payments (capacity or energy payment prices)
  - Annual fixed overhead , for administrative costs and costs for scheduling into CAISO market
  - For PSA Offers, fixed cost will be determined by PG&E's Cost of Service Model, which will determine revenue requirements

# Portfolio Adjusted Value (“PAV”)

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- **PAV modifies the NMV to account for elements that impact a particular Offer’s value in the context of PG&E’s electric portfolio**
- **PAV calculations make explicit and systematic adjustments to NMV to reflect portfolio effects and preferences that benefit PG&E customers**
- **PAV adjustments may include, but are not limited to:**
  - **Location (preference for projects in PG&E’s service territory)**
  - **Transmission Network Upgrade Cost**
  - **Distribution System Investment Deferral Value (for those projects only)**
    - **Note no Transmission Deferral projects for this round due to CAISO process**
  - **Increased Efficiency of Fossil Generation (includes GHG impacts)**
    - **Based on in-out system-wide production simulation runs; longer duration will show greater benefit**
  - **Renewable Generation Curtailment Support**
    - **Also from production simulation; captures reduced need for RPS procurement**

# Qualitative Factors

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Qualitative factors PG&E may consider include:

- **Project Viability**
- **Supplier Diversity**
- **Credit**
- **Technology Diversity**
- **On-line Date Diversity**
- **Contract Modifications**
- **Counterparty Concentration**
- **Safety**

# Project Viability

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- **Company/development team experience**
- **Technology feasibility**
- **Development milestones**
  - **Site, permitting, project financing status**
  - **Reasonableness of Commercial Operation Date**

# Supplier Diversity

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- **Supplier diversity is an important initiative at PG&E**
- **In 2013, PG&E achieved its highest level of diversity spending at \$2.3 billion or 42.1% of all spending on Diverse Business Enterprises (DBEs)**
- **The company could not have achieved this milestone without the help of our largest suppliers**
- **We urge prime suppliers to give DBEs the maximum practicable opportunity to provide products and services to PG&E**
- **DBEs are women-, minority-, service disabled veterans- and lesbian-, gay-, bisexual-, transgender- business enterprises.**



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# Interconnection Information

# Wholesale Generator Interconnection Study Processes

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**Participants are not required to have an interconnection study completed by the time of offer submission.**

- **Shortlisted Participants will need to have a valid interconnection application by contract execution.**
  - **CAISO Cluster 8 Application window deadline: April 30, 2015**
  - **PG&E's Wholesale Distribution Cluster (WDT) window deadline: March 31, 2015**
  - **First-come-first-serve for qualified projects: Independent Study Process and Fast Track applications under CAISO GIDAP and WDT**
- **Wholesale Electric Interconnection website:**  
[www.pge.com/en/b2b/energytransmissionstorage/newgenerator/index.page?](http://www.pge.com/en/b2b/energytransmissionstorage/newgenerator/index.page?)

# Wholesale Generator Interconnection Study Processes

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- **Processes**
  - **Fast Track**
  - **Independent Study**
  - **Cluster Study**
- **For future RFOs, Participants should initiate the interconnection process early, to ensure that eligibility requirements are met.**

# Fast Track and Independent Schedule – Application through Interconnection Agreement

Fast Track	Window	Initial Review	Supplemental Review	Interconnection Agreement	Timeline
CAISO connections	No window	30-90 calendar days	90 calendar days	~4 months	~6-10 months
PG&E connections	No window	15 business days	20 business days	~4 months	~9 months
Independent Study	Window	SIS	FAS	Interconnection Agreement	Timeline
CAISO connections	No window	60 calendar days	60 calendar days	~4 months	~9 months
PG&E connections	No window	60 business days	60 business days	~4 months	~16 months

# Cluster Schedule – Application through Interconnection Agreement

CAISO Cluster Group	Application Window	Phase I	Phase II	Interconnection Agreement
7	<b>Closed</b>	Target December 2014	Target November 2015	Target Fall 2016
8	April 2015	Target December 2015	Target November 2016	Target Fall 2017

PG&E WDT Cluster	Application Window	Phase I	Phase II	Interconnection Agreement
7	<b>Closed</b>	Target January 2015	Target January 2015	Target April/May 2016
8	March 2015	Target January 2016	Target January 2017	Target April/May 2017

# Post-Interconnection Agreement Process

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- **Post-Interconnection Agreement, PG&E and Participant engineer, design, procure and construct (EPC) electrical. Timeline for completion dependent on scope of capital improvements assigned to project**
  - **PG&E engineers capital improvements per Interconnection Agreement**
  - **Participant engineers electrical system on participant's side of the Point of Change of Ownership and any upgrades to be participant-built and deeded**
- **Post-EPC, PG&E, CAISO and participant coordinate a pre-parallel inspection and commissioning to achieve commercial operation**

# Post-Interconnection Agreement Process

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- **Note some Critical Path Items:**
  - **Long Lead Time Material Procurement**
  - **Clearance Window (typically between April and October each calendar year)**
  - **Local Government Approvals and California Public Utilities Commission (CPUC) Interconnection and County Permitting (could cause a project to take an additional two to three years to complete)**
  - **Land acquisition**
  - **Environmental Evaluation and Permitting (could take two to three years to complete)**

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# Keys to a Successful Bid



# Keys to a Successful Proposal

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- **Expect a strong solicitation response**
- **Submit a competitively priced and thoughtfully outlined Offer**
  - **Projects must be able to evidence a path toward completing siting, development, permitting, and if applicable, interconnection by the proposed online date**
  - **If applicable, be ready to submit CAISO interconnection application by April 30, 2015**
  - **If applicable, be ready to submit to PG&E's wholesale distribution window by March 31, 2015**
- **Submit a complete Offer Package by the deadline**
  - **Project meets the eligibility requirements**
- **Respond promptly and concretely to inquiries by PG&E regarding your Offer**

# Offer Submittal

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# Intermission

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# Q & A