

RENEWABLES PORTFOLIO STANDARD

2014 SOLICITATION BIDDERS' WEBINAR

January 7, 2015

Agenda

Presenters: Sandy Burns, Pauline Cheng

Topics:

- Introduction
- Solicitation Overview
- 2014 Procurement Target
- 2014 Key Changes
- PPA Overview
- Evaluation Methodology
- Offer Submittal Process
- Intermission
- Q & A

Q&A / List of Attendees / Audio Replay

- Participants should email questions to RenewableRFO@pge.com during the Webinar
 - Questions will be answered at the end of the Webinar
 - PG&E may not address all of the questions during the Q&A portion of the Webinar
 - After the Webinar, PG&E will compile and post a Q&A document on PG&E's RFO website at:
<http://www.pge.com/en/b2b/energysupply/wholesaleelectricssolicitation/RFO/RPS2014.page>. The audio portion of the Webinar will be posted on PG&E's website as well.
 - PG&E will be posting 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 us an email to RenewableRFO@pge.com by 5:00 P.M. PPT, January 9th.

Disclaimers



- **This presentation is intended to provide a summary level discussion of the information and requirements established in the RFO materials (it does not include all of the detailed information in the RFO materials)**
- **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 shall govern**
- **PG&E encourages Participants to review carefully RPS Solicitation Protocol and all RFO materials dated January 5, 2015**
- **PG&E reserves the right, in its sole discretion, to terminate the Solicitation for any reason (See Protocol Section XVI)**

Solicitation Overview

RFO Schedule



DATE / TIME	EVENT
January 7, 2015	Bidders' Webinar
January 5- January 28, 2015 1:00 P.M., Pacific Prevailing Time ("PPT")	Stage 1: Window to submit the Introductory Letter, Attachment D and Attachment L. Include the Phase II study or equivalent study along with your submittal. Stage 1 will close on January 28 at 1:00 P.M. PPT. Participants may submit Attachment I, and J1-J6 during this window.
January 29 – February 4, 2015 1:00 P.M. PPT	Stage 2: Window to submit the Attachments: I, J1 through J6. Stage 2 closes on February 4 th at 1:00 P.M. PPT.
April 2, 2015	PG&E notifies Shortlisted bidders and requests Offer deposit
April 6, 2015 12:00 P.M. PPT	Participant notifies PG&E whether it accepts Shortlist position from PG&E
April 7, 2015	PG&E submits Shortlist to Commission and Procurement Review Group
April 20, 2015	Participant that accepted Shortlist position posts offer deposit and submits signed Confidentiality Agreement
May 7, 2015	PG&E submits report on evaluation criteria and selection process; Independent Evaluator submits preliminary reports
TBD	PG&E and Participants negotiate and execute Agreements subject to Regulatory Approval; PG&E submits Agreements for Regulatory Approval.
April 6, 2016	PG&E 2014 RPS Solicitation Shortlist Expires

Independent Evaluator (“IE”)

- **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 bids are treated consistently
 - Report on 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**
- **2014 IE is Arroyo Seco Consulting (Lewis Hashimoto)**

Eligible RPS Offers

- **Eligible resources**
 - All eligible renewable resources as determined by CEC. The CEC Guidebooks available at <http://www.energy.ca.gov/renewables/> explain the criteria for RPS eligibility of renewable energy resources
 - New, existing and repowered facilities are eligible
- **Minimum project capacity**
 - Projects offering As-Available or Baseload products must have a minimum capacity of 0.5 MW
- **Interconnection Status**
 - Participants must have at least a Phase II Study from the CAISO or equivalent; for existing and repowered facilities, Participants must provide confirmation that their plans can be accommodated under the existing interconnection agreement
 - Participants may submit offers as energy-only or with partial or full capacity deliverability status
- **Environmental Permitting Status**
 - Projects must have achieved, at a minimum, the “application deemed complete” (or equivalent) status under the land use entitlement process by the lead permitting agency
- **Delivery Term**
 - Delivery Term to start on 1/1/2020 or later
 - Minimum offer term of 10 years unless
 - Offers for short-term extensions of existing projects may be considered to the extent the deliveries are eligible for banking under statute and applicable CPUC decisions
- **Offer Structure**
 - PPA structure only—no ownership offers or site offers accepted

2014 Procurement Target

Bundled Load and RPS Procurement Need



- PG&E's procurement target for this RFO is between ZERO and 1,600 GWh
- PG&E's October 2014 load forecast assumes 35% of bundled sales to be met by Community Choice Aggregation, Direct Access and Distributed Generation
- This substantial reduction means that PG&E will be well positioned to meet its 33% RPS obligation through the middle of the next decade, and would not have an incremental procurement need in this RFO
- However, if the load does not migrate to CCA, DA or DG as anticipated then PG&E will have an incremental RPS around 2020
- PG&E will seek to enter into RPS PPAs resulting from this RFO only if it appears there will be incremental need

2014 Key Changes

Key Changes from 2013 RPS

- **PG&E accepting offers from projects with delivery dates on 1/1/2020 or later**
- **Minimum size reduced from 1.5 MW to 0.5 MW**
- **Sellers required to submit at least two offer variations for operational flexibility**
 - **One variation must allow PG&E to economically bid the project into the CAISO market at all hours; this variation would include unlimited buyer curtailment for which the seller would be compensated at contract price**
 - **Seller must submit at least one other variation that includes fewer hours of Buyer Curtailment, for which Seller would be compensated at contract price or other price to be specified by Seller**
- **Integration Cost adder to be included in net market value calculation**

Key Changes from 2013 RPS

- **Additional Deliverability Flexibility:** Seller may specify a date after COD upon which it will provide full capacity deliverability (FCDS) status
 - Project will be evaluated as energy-only until that date
 - Seller subject to damages for up to two years if deliverability is not achieved
 - After 2 years, event of default
- Seller asked to provide more detailed information about project design in Appendix IV (Project Specifications and Contract Capacity Calculation)
- Requirement to submit GIS files pursuant to D.14-11-042
- Environmental Permit Status requirement for projects to have achieved, at a minimum, the “application deemed complete” (or equivalent) status under the land use entitlement process by the lead permitting agency pursuant to D.14-11-042
- Diverse Business Suppliers updated to include Lesbian, Gay, Bisexual, and Transgender-owned Businesses per G.O. 156

Key Changes from 2013 RPS (Storage)

- **Sellers required to submit at least two offer variations for projects with storage (with and without storage)**
- **Offer Pricing Structure:**
 - **PPA anticipated to allow RPS project to continue delivery of energy if storage fails to meet contractual obligations**
 - **Seller to offer two prices for projects with storage—One \$/MWh price for product when storage meets contract obligations and another in the event of storage failure**
- **Seller asked to provide more detailed operating characteristics of storage for better evaluation of flex RA and ancillary services benefits**

PPA Overview

Form Contracts

- **Three form contracts**
 - **Attachment H1: Form of Power Purchase Agreement (“PPA”) for Category 1 and Category 2 Products**
 - **Attachment H2: Form of Renewable Energy Credit Purchase Agreement (“REC Agreement”) for Category 3 Products**
 - **Attachment H3: Form of Sale Agreement**
- **Your comments are not required on the PPA or REC Agreement at time of your initial offer submission. However, PG&E strongly encourages you to become familiar with, and take into consideration, the terms and conditions of applicable agreement while you put together your offer. Your offer should not anticipate deviating from the terms of the contract unless the delivery structure or other elements of your offer would require modification.**

PPA – Key Commercial Terms and Changes for 2014



- **Seller commits to Guaranteed Project Milestones**
 - Construction start date
 - Commercial operation date
 - There are provisions for excused delay relating to force majeure, transmission and permitting
- **Third Party Sale Option:**
 - Includes the ability for Seller to make a one-time election to sell to a Third Party before the Initial Energy Delivery Date (IEDD) to PG&E
- **Credit Requirements**
 - Project development security (PDS) for all technologies is \$60/kW for As-Available resources and to \$90/kW for baseload and dispatchable resources. This is the amount posted by Seller prior to the IEDD.

PPA – Key Commercial Terms

- **Excess network upgrade cost termination right**
 - Pursuant to D. 12-11-016, PG&E may terminate the PPA if the results of any interconnection study or agreement indicate that network upgrade costs will exceed the amount agreed upon (“transmission cost cap”) between Seller and PG&E
 - In lieu of contract termination, seller may buy-down the excess transmission costs above the transmission cost cap, subject to FERC/CAISO approval of any modified interconnection agreement

PPA – Key Commercial Terms

- The delivery Point shall be the PNode designated by the CAISO for the Project
- Contract price must be in \$/MWh (all-in) for all products except for dispatchable (\$/kW-year for capacity, \$/MWh for energy)
 - Prices should be fixed
 - Indexed prices not accepted, though prices may be different from year to year
- Seller receives contract price as adjusted by TOD factors; TOD factors, and TOD periods remain unchanged from 2013; TOD factors do not apply to projects with dispatchable storage
- Annual payments for baseload projects based on prices adjusted for TOD will be limited to 105% of the contract price. This limit can result in sellers reimbursing PG&E if the seller delivers excessive amounts of energy during peak period
- Minimum output requirements apply to all technologies except small hydro
- Certain non-modifiable terms (highlighted in form PPA)

PPA – Key Commercial Terms

- **PG&E is scheduling coordinator for projects in CAISO control area**
- **As-available resources**
 - Sellers provide weather and availability data and other information to PG&E
 - PG&E forecasts and schedules energy from the project and bears imbalance risk. Seller and PG&E shall cooperate to minimize such risk.
 - PG&E may assess “Forecasting Penalty” in order to offset PG&E’s imbalance costs during certain periods due to the Seller’s failure to meet the data and other requirements under the Agreement
- **Baseload resources**
 - Seller provides schedule
 - Seller is responsible for all costs, charges, and imbalances and CAISO penalties assessed by the CAISO

PPA – Key Commercial Terms

- **Curtailment**
 - Seller must curtail energy deliveries in response to curtailment requests from the CAISO or PG&E. Review the Agreement carefully to better understand under what circumstances Seller will or will not be reimbursed for curtailed energy deliveries.
 - PG&E has the right to require the seller to curtail energy deliveries during the “Buyer Curtailment Period” and PG&E will pay for such curtailed energy at the contract price
- **Deliverability**
 - New for 2014: Agreement allows Seller to specify a date after IEDD by which it will achieve deliverability; Seller may pay RA deficiency amount for up to 2 years if date is not met; After 2 years failure to achieve deliverability is an event of default
 - Offers from projects that will be energy-only or provide partial capacity deliverability must modify the Agreement as necessary

PPA – Key Commercial Terms

- **Seller is liable for a damage payment for an event of default prior to IEDD**
 - The Damage Payment is equal to the amount to be held as Project Development Security
- **Seller is required to meet operational parameters as specified in PPA**
 - 2014 PPA includes additional information on operational characteristics of facility
- **Supplier Diversity:**
 - Targets and reporting obligations for Delivery Term

Time of Delivery (“TOD”) Factors for TOD Period



TOD FACTORS: FULL CAPACITY DELIVERABILITY STATUS

TOD PERIOD

Monthly Period	Peak	Shoulder	Night
Jul – Sep	2.2304	0.8067	0.9569
Oct – Mar	1.1982	0.7741	0.9399
Apr – Jun	1.1941	0.6585	0.9299

TOD FACTORS: ENERGY ONLY

TOD PERIOD

Monthly Period	Peak	Shoulder	Night
Jul – Sep	1.4514	0.8317	1.0144
Oct – Mar	1.2855	0.8312	1.0092
Apr – Jun	1.1327	0.7036	0.9977

The TOD Periods and Factors remain the same as those from the 2013 RPS RFO

TOD Factors



- **Payment**
 - Contract Price * TOD Factor * MWh
- **Peak**
 - Hours ending 16-21 Pacific Prevailing Time (“PPT”) all days in the applicable monthly period
- **Shoulder**
 - Hours ending 7-15 PPT all days in the applicable monthly period
- **Night**
 - Hours ending 1-6, 22, 23 and 24 PPT all days in the applicable monthly period

Hours apply 7 days per week including NERC holidays.

Evaluation Methodology

Evaluation Methodology

- **Quantitative criteria**
 - Net Market Value
 - Portfolio Adjusted Value
- **Qualitative criteria**
 - Project viability
 - RPS goals
 - Supplier diversity
- **Other Considerations**
 - Contribution to energy storage targets
 - Contract Modifications
 - Creditworthiness
 - Seller Concentration
 - Delivery Term
 - PG&E prior experience with Seller
 - Safety

See Attachment K of the Solicitation Protocol for details of the evaluation criteria

$$\text{(Adjusted) Net Market Value} = E + C + S - (P + T + G + I)$$

- **E - G = Energy benefit – Congestion Cost**
 - Based on market prices and Locational Marginal Pricing (LMPs) multipliers applied to reflect congestion and losses
 - Includes energy value from Buyer Curtailments for avoiding (presumably negative) wholesale market price for the Offer's energy delivery
- **C = Capacity benefit** is based on
 - PG&E's internal estimate of avoided cost of capacity, and
 - Offer's contribution to meeting PG&E's future Resource Adequacy requirements
- **S = Ancillary Service benefit** based on Offer's Ancillary Service capability. Assumed to be zero for non-dispatchable offers.
- **P = Post TOD Adjusted PPA Price** based on Offer's contract price and TOD factors and includes debt equivalence
- **T = Transmission Network Upgrade Cost** based on study results or interconnection agreement
- **I = Integration Cost** calculated pursuant to D. 14-11-042

Market Valuation (Storage)

Projects with Dispatchable Storage may have additional benefits not provided by other projects

- Energy Value
 - Includes value of being able to shift energy from hour to the next, depending on hours of storage provided
- C = Capacity benefit
 - Includes Offer's contribution to meeting PG&E's future flex RA requirements
- S = Ancillary Service benefit
 - Dispatchable storage may include Ancillary Service capability.

Market Valuation (Renewable Integration Charge)



- The Renewable Integration Cost Adder (RICA) is calculated as the sum of two cost components: 1) variable costs; and 2) fixed costs
- The **variable cost component** is set at \$3/MWh for solar and \$4/MWh for wind
- The **fixed cost component** is calculated as the product of two parameters:
 1. The monthly increase (or decrease) in the need for flexible RA associated with one MW of installed capacity of wind or solar (“Contribution to Flexible Capacity Needs”) expressed as MW of flexible capacity needed per MW of wind or solar capacity; and
 2. PG&E’s internal/confidential projection of a monthly premium (which can be zero or positive) for flexible RA expressed as \$/kW-month

Portfolio Adjusted Value (“PAV”)

- 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
- PG&E will evaluate PAV by adjusting NMV by the following components:
 - Location
 - RPS Portfolio Need
 - Energy Firmness
 - Curtailment
- PAV is intended to represent the value of an Offer in the context of PG&E’s portfolio by making explicit and systematic adjustments for PG&E’s preferences on each component

PAV Adjustments – Location

- PG&E has a preference for resources located in NP15
- PAV adjusts the value of energy and capacity for offers from resources in SP15
 - Energy Benefit Adjustment
 - PAV Energy Benefit for projects in SP15 or outside of CAISO is no greater than the Energy Benefit calculated using NP15 energy prices
 - Capacity Benefit Adjustment
 - SP capacity prices are no higher than the short-run avoided cost of capacity, and less than the NP capacity prices
 - The adjustment reflects the fact that PG&E may be more likely to be long in capacity from SP15 in counting toward PG&E's RA requirements

PAV Adjustments – Curtailment Hours Offered



- **PG&E has a preference for offers that allow PG&E to curtail generation at any time at Buyer’s discretion for which the Seller will be compensated. Bids offering more buyer curtailment hours and at a lower contractual price if curtailed are preferred.**
- **PG&E prefers offers with less restrictive buyer curtailment provisions because they may help:**
 - Avoid negative prices
 - Reduce imbalance charges from CAISO
 - Avoid involuntary curtailment orders
 - Avoid extreme volatility in spot market prices
 - Reduce operational complexity

Project Viability

- All offers will be evaluated and scored using current version of the CPUC Project Viability Calculator (PVC)
- Company/Development Team
 - Project development experience
 - Ownership and O&M experience
- Technology
 - Technical feasibility
 - Resource quality
 - Manufacturing supply chain
- Development Milestones
 - Site control
 - Permitting status
 - Project financing status
 - Interconnection progress
 - Transmission system upgrade requirements
 - Reasonableness of Commercial Operation Date

- RPS Goals will take into account State goals:
 - Environmental and economic benefits to communities afflicted with poverty or high unemployment, or that suffer from high emissions levels of toxic air contaminants, air pollutants, and greenhouse gases.
 - Impact on water quality and consistency with the CPUC's Water Action Plan adopted on December 15, 2005 and updated October 2010
 - Governor's executive order S-06-06 on biomass

Supplier Diversity

- **Supplier diversity is an important initiative at PG&E**
- **Diverse Business Enterprise definition has been expanded to include LGBT suppliers**
- **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**

Offer Submittal Process

Offer Requirements

- An offer refers to a particular project at a particular site. An offer variation refers to changes in an offer for the same site.
- No limit on number of offers allowed per seller. Each offer may have up to 7 variations, excluding the primary offer
 - Submittal of primary offer is required. This offer must comply with the terms and conditions, credit and guaranteed energy production requirements of the PPA, and includes unlimited buyer curtailment.
 - Submittal of at a secondary offer variation that caps the annual number of hours that may be curtailed is required
 - Offers with storage should include as their primary offer a variation that does not include the storage component
- Contract Price offered in each offer must be independent
 - The contract price offered for one project cannot be dependent on whether PG&E elects to execute a PPA with another project
- Offers variations may include:
 - Size
 - Delivery term
 - Commercial operation date
 - Price (e.g. fixed vs. escalating prices)
 - Delivery Profile
- Sellers should select their most competitive and viable projects for submission

Offer Submittal Process

- Offers must be submitted via the online platform Power Advocate
- Participants must register through Power Advocate at <https://www.poweradvocate.com/pR.do?okey=46159&pubEvent=true>. PG&E strongly encourages you to register well in advance of Offer due dates. Only accepted registrants are permitted to submit Offers.
- Detailed instructions for submitting Offer(s) and using Power Advocate are available on PG&E's website www.pge.com/rfo under “2014 Renewables RFO”.
- Offer package must contain all required information and must be organized as described in the Solicitation Protocol Section VI. Submittal Process Overview, Required Information, and Submittal Deadline
- For Stage 1 window, Participants are able to submit all requested information between January 5- January 28, 2015 1:00 P.M. PPT. Information due:
 - Introductory Letter
 - Attachment D1 or D2: Offer Form, as applicable
 - Attachment L: Transmission and Interconnection¹

¹ Includes the Phase II study or equivalent, and if applicable, the interconnection agreement

Offer Submittal Process

- For Stage 2 window, Participants must submit all other requested information during January 29 – February 4, 2015 1:00 P.M. PPT. Information due:
 - Attachment I: Term Sheet
 - Attachment J1 to J6: Project Information
- Any Participant that does not submit information required during Stage 1 will not be allowed to participate in the RFO
- PG&E strongly encourages you to submit early and not wait until January 28th to submit your Offers online
- You may submit your Stage 2 deliverables during Stage 1. However, please follow the instructions posted on the website.
- Information due on Monday, April 20, 2015 if Shortlisted
 - Attachment B: Form of Letter of Credit
 - Attachment G: Confidentiality Agreement
 - Attachment F: Request for Taxpayer ID Number (W-9)

Offer Form Overview

- Two different offer forms
 - Attachment D1: Category 1 product
 - Attachment D2: Category 2 and 3 products
- A few new data points requested
- Instructions
 - Be sure to enable macros when opening the offer form
 - Instructions tab provides clear directions on completing the offer form
 - Please make sure you submit an excel form. No other formats will be accepted.
 - Each cell with a light yellow background must be filled out. 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
 - If the word “Complete” does not appear at the top of the page, the form will be deemed invalid and returned to you

Attachment D1: Offer Form Structure

- Instructions
- Participant Information
- Product Description
- Gen Pricing
- Gen Profile
- Supplier Diversity
- Dispatchable (if applicable)
- Operating Information (if applicable)—new
- Degradation (if applicable)—new
- Storage Details (if applicable)—new
- Alternative Production Profile (if applicable)
- Project Viability Worksheet
- Validation

Offer Form – Product Description

Transmission & Generator Information		
Interconnection App. Status	Phase II study or equivalent complete	Expected Interconnection Point
Interconnecting Utility	PG&E	Closest Substation
Other Utility	[Redacted]	
Interconnection Point Status	Does not exist & not fully permitted to construct	
Interconnection Queue	CAISO - GIP	Direct Assigned Cost (\$)
Queue Number		\$10,000
Interconnection part of Cluster 5 or Later Studies?	Yes	Area Delivery Network Upgrade Costs (\$)
Interconnection Applied For?	Full Capacity Deliverability	\$1,000,000
Interconnection Choice	Option A	Local Delivery Network Upgrade Costs (\$)
Interconnection Agreement Capacity	75 MW	\$500,000
Interconnection Voltage	60 kV	Reliability Network Upgrade Costs (\$)
Interconnection Level	Transmission	\$750,000
Delivery Market	NP15	Total Network Upgrade Costs (\$)
Delivery Market Other	[Redacted]	\$2,250,000
Reliance on major transmission line?	None	Network Upgrade Construction Time (months)
		60
		Deliverability % (for partial deliverability, list % of full deliverability)
		75.00%
	Other Characteristics	

Interconnection Choice: Select Option A or Option B

For Partial Deliverability, enter the percentage of interconnection agreement capacity that is being (or has been) studied for deliverability. For Full Capacity Deliverability enter 100%.

Offer Form – Product Description



Offer Information			
Product Type	<u>As Available</u>	Capacity (MW)	20.00
Capacity Type	<u>Full Capacity Deliverability</u>	Avg Pre-TOD Price (\$/MWh)	\$0.00
Guaranteed Construction Start Date		Storage Included	Yes
Initial Online Date		Storage Dispatchable	Yes
Contract Start Date		Description	
Full Deliverability Date			
Delivery Term (months)	240		20.00 years

If your project includes storage and can be dispatched by PG&E, select 'Yes'. The 'Operating Information' and 'Degradation' tabs will be visible.

If the storage cannot be dispatched by PG&E, select 'No'. The Storage Details tab will appear.

Offer Form – Energy Pricing

Existing TOD Factors for each TOD Period TOD Performance Requirements						
Time of Delivery (TOD) Periods & Factors						
Monthly Period	1. Peak		2. Shoulder		3. Night	
	Energy	Full Deliv	Energy	Full Deliv	Energy	Full Deliv
July - September	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
October - March	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
April - June	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

TOD Factors equals 1 for all seasons and periods for offers with dispatchable storage.

Enter 0 for fixed pricing or a percentage for escalating pricing.

Contract Price Escalation Rate

Storage Price Escalation Rate

Step 1

Step 3 - Calculate

Step 4 - Instructions

For offers with dispatchable storage, the Storage Price and Storage Price Escalation rate appears.

Contract Capacity (MW)	Expected Annual Capacity Factor (%)	Contract Quantity: Expected Annual Net Energy (MWh)

Contract Price (\$/MWh)	Storage Price (\$/MWh)

Step 2

Offer Form – Energy Pricing

Curtailment Provisions

The primary offer variant 'a' must reflect PG&E's unlimited right to economically curtail the resource (consistent with resource operating constraints). The offer's contract price should include the assumption that all curtailed energy will be paid at the contract price.

Annual hours project may be curtailed hours

Can the project respond within 5 minutes to Dispatch instruction?

If not 5 minutes, please specify (in minutes or in hours) the advance notice necessary for Dispatch instruction?

Maximum number of Buyer Bid Curtailment and/or Buyer Curtailment Orders per calendar day

If not unlimited, please enter the maximum number per calendar day

Ramp rate minutes

Minimum Operating Capacity hours

MW/minute

MW

Additional Curtailment Information

Curtailment Pricing Options	
(a) \$/MWh (Pre-TOD)	(b) % of Contract Price
	100.00%

This field defaults to 8760 for the primary offer variant 'a'.

The contract price defaults to 100 % for the primary offer variant 'a'.

Offered response time should reflect operational constraints of the project. PG&E expects projects to be able to respond in the Real-Time CAISO Market (currently 5 minute intervals) unless there are technology constraints.

Offered maximum number should reflect operational constraints of the project.

Offer Form – Energy Pricing



Enter the number of hours for the secondary offer variant 'b'.

Curtailment Provisions

*The second offer variant 'b' must cap the number of hours that PG&E may economically curtail.
For this second bid variant, the Seller may specify a different price to be paid for the hours that may be curtailed.*

Annual hours project may be curtailed hours

Can the project respond within 5 minutes to Dispatch instruction?

If not 5 minutes, please specify (in minutes or in hours) the advance notice necessary for Dispatch instruction? minutes
 hours

Maximum number of Buyer Bid Curtailment and/or Buyer Curtailment Orders per calendar day

If not unlimited, please enter the maximum number per calendar day

Ramp rate MW/minute

Minimum Operating Capacity MW

Curtailment Pricing Options
[Populate either (a) or (b)]

(a) \$/MWh (Pre-TOD)	(b) % of Contract Price

Additional Curtailment Information

Enter the contract price defaults for the secondary offer variant 'b'.

Offer Form – Operating Information



Signal Response and Control

Is storage dispatchable by PG&E?

Is the energy storage resource capable of receiving and responding to CAISO control signals, including ADS and AGC?

Is the energy storage resource capable of being controlled by utility standard SCADA signal?

Describe any user software available to monitor/control your energy storage technology (if not applicable or unknown at this time, please indicate that in your response):

Describe the process and requirements from the time a signal is received to startup (if not applicable or unknown at this time, please indicate that in your response below):

If your offer includes storage and it can be dispatched by PG&E, this tab appears.

PG&E will evaluate the dispatchability of the storage in its evaluation using storage characteristics provided

Storage Unit Specification

Storage Method

Storage Unit Technology

Specific Storage Technology

Lithium Battery Type

Other Lithium Battery Type

Storage Technology Description

Offer Form – Operating Information

Charging/Discharging Parameters

- 100% State of Charge (SOC) is defined as the highest state of charge to which the system can be consistently charged without damage beyond expected degradation from normal use.
- 0% SOC is the lowest state of charge to which the system can be consistently discharged without damage beyond expected degradation from normal use.
- If Seller normally specifies highest and lowest SOC values differently, Seller should normalize minimum and maximum SOC to 0% SOC and 100% SOC, respectively.
- Seller should also normalize reporting of energy stored such that the amount of energy stored at 0% SOC is 0 MWh and that the energy stored at 100% SOC is fully available for discharge.

To complete this section begin by making a selection in the Monthly Variations column. Select "Yes" to unlock the month columns. Select "No" to enter a single value for the row in the January Value column.

Parameters	January Value	Unit	Monthly Variations?	Monthly Variations Over the First Contract Year									
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Design Dmax	0.00	MW	<Choose>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Design Dmin	0.00	MW	<Choose>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Design Discharge Duration	2.00	Hrs	<Choose>										
Design Dmax Duration	2.00	Hrs	<Choose>										
Design Storage Energy	0.00	MWh	<Choose>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Design Duration Energy	0.00	MWh	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Design Cmax (this is a negative value)	0.00	MW	<Choose>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Design Cmin (this is a negative value)	0.00	MW	<Choose>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ancillary Services Information

	Regulation	Spinning Reserves	Non-spinning Reserves
Provided to PG&E to schedule?	Yes	Yes	Yes
Maximum amount of MWs that a Facility can provide when discharging			
Maximum amount of MWs that a Facility can provide when charging			

Ramp Rates

Please provide the average ramp rates. This is calculated by dividing the change in MW for the specified ramping range, by the minutes required for the facility to change between the specified operating levels. Exclude the time it takes to produce an AC electrical response from the time that a communication signal for instruction is received.

Dmin to Dmax		MW/min
Cmin to Cmax		MW/min
Dmax to Dmin		MW/min
Cmax to Cmin		MW/min

Examples of storage parameters that are requested.

Glossary of Terms available on Energy Storage RFO website.

Offer Form – Degradation



Power Degradation				
Power (MW) Degradation Driver:	<input type="text" value=" <Choose One>"/>			
If Other, specify:	<input type="text"/>			
Power (MW) Degradation Curve				
Degradation Interval	% Design Dmax ⁽¹⁾	% Design Dmin ⁽¹⁾	% Design Cmax	% Design Cmin
0	100.00%	100.00%	100.00%	100.00%

Description

The purpose of this tab is to solicit information regarding degradation of your storage component. You can choose “Contract Year, Hours, Delivered Discharge Energy, Other”.

There is an illustrative example provided to assist you.

*** DEGRADATION EXAMPLE ***		
Example: Degradation and Overhaul Impacts on Design Dmax and Design Storage Energy		
Degradation Intervals (hours)	% Design Dmax ⁽¹⁾	% of the Design Storage Energy
0	100.00%	100.00%
100	95.00%	96.00%
500	89.00%	91.00%
500	97.00%	98.00%
1,000	91.00%	92.00%
1,500	83.00%	85.00%
1,500	96.00%	97.00%

Description

This section is for example purposes only.

Offer Form – Storage Details

Storage Unit Specification	
Storage Method	<Choose One>
Storage Unit Technology	
Specific Storage Technology	
Lithium Battery Type	
Other Lithium Battery Type	
Storage Technology Description	

If your offer includes storage and the storage cannot be dispatched by PG&E, this tab appears.

Offer Information	
Design Dmax (maximum power steady state power discharge from 100% to 0% State of Charge, measured as MWh/hr, which is equivalent to MW)	MWh

Charging/Discharging Parameter	
Design Storage Energy	MWh

Offer Form – Validation



Attachment D1 Validation Worksheet

Please make sure your form is complete before you submit it. If the form is not complete, please do not submit it as it will be returned to you.

This form is not complete. Please do not submit the form until you have filled in all the required information.

Tab Name	Message
Participant Information	There are 28 or more missing values or un-satisfied requirements on this tab
Product Description	There are 40 or more missing values or un-satisfied requirements on this tab
Gen Pricing	This tab is visible only the "Product Type" selected on the "Product Description" tab is not "Dispatchable"
Gen Profile	Complete
Operating Information	This tab is visible only if both "Storage Included" and "Storage Dispatchable" equal "Yes" on the "Product Description" Tab
Degradation	This tab is visible only if both "Storage Included" and "Storage Dispatchable" equal "Yes" on the "Product Description" Tab
Storage Details	This tab is visible only if "Storage Included" equals "Yes" and "Storage Dispatchable" equals "No" on the "Product Description" Tab
Dispatchable	This tab is visible only if "Product Type" equals "Dispatchable" on the "Product Description" Tab
Alternative Production Profile	This tab is visible only if "Project has Alternative Production Profile?" equals "Yes" on the "Gen Profile" Tab
Project Viability Worksheet	There are 33 or more missing values or un-satisfied conditions on this tab
Supplier Diversity	Complete

You must submit an offer form with the “Complete” message or it will be returned to you.

Attachment D2: Offer Form Structure

- Instructions
- Participant Information
- Product Description
- Pool Offer Information (if applicable)
- Pricing
- Delivery Profile
- Project Viability Worksheet
- Supplier Diversity
 - Supplier Diversity tab is the same as Attachment D1

Intermission

Q & A