

Mid-Term Reliability Request for Offers (RFO) – Phase 2 Participants' Webinar

April 26, 2022



Together, Building
a Better California



Q&A / Audio Replay

- At any time during this presentation participants should email their questions to Solicitation mailbox: MidTermRFO@pge.com
- There will be time to answer questions 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 website at: <http://www.pge.com/rfo/midtermrfo-phasetwo>
- The audio portion of the webinar will also be posted on PG&E's website as noted above



Document Conflicts

- This presentation is intended to be a summary level discussion of the information and requirements established in the Solicitation materials (it does not include all of the detailed information in the Solicitation materials).
- To the extent that there are any inconsistencies between the information provided in this presentation and the requirements in the Solicitation materials, the Solicitation materials shall govern.
- PG&E encourages participants to carefully review the **Mid-Term Reliability RFO – Phase 2 Protocol**.
- If Participants have questions regarding the Solicitation documents, PG&E asks Participants to seek clarity by submitting their questions to the Solicitation mailbox (MidTermRFO@pge.com) prior to submitting an Offer.



Objective & Agenda

- The purpose of this webinar is to provide information to Participants who may submit Offers into PG&E's Mid-Term Reliability RFO – Phase 2.
- Topics
 - Solicitation Schedule
 - Independent Evaluator
 - California Public Utilities Commission (CPUC) Proposed Decision Overview
 - Solicitation Overview
 - Eligibility Requirements
 - Agreement Overview
 - Intermission
 - Q&A



Solicitation Schedule

Date/Time	Event
April 26, 2022	Participants' Webinar
June 1, 2022 at 1PM (PPT)	Deadline for Participants to submit Offers via Power Advocate
By August 1, 2022	PG&E notifies selected Participants of Shortlist Status
By August 8, 2022	Deadline for Shortlisted Participants to accept Shortlist status and post Shortlist Offer Deposit
August 15, 2022	Shortlisted Offers should provide redlines of commercial agreements
November 30, 2022	Target timeframe of Execution: 2024 online dates, Battery Long Duration Storage, Zero Emitting, Firm Zero Emitting
Q1 2023	Target execution of remaining projects
Q1 2023	Target Advice Letter filing date for CPUC approval

* PG&E will look to notify Sellers of Shortlist status earlier than August 1 if possible



Independent Evaluator (IE)

- Primary role of the IE is to:
 - Monitor solicitation processes to ensure fair and equal treatment of all potential counterparties.
 - Monitor evaluation processes to ensure PG&E has implemented methodology as described and that offers are treated consistently
 - Report on Solicitation process and proposed transactions to the CPUC when filed for CPUC approval.
- The IE may review all proposal data and communications with Participants
- Mid-Term Reliability RFO – Phase 2 IE is Merrimack Energy.
 - Wayne Oliver & Keith Oliver: MerrimackIE@merrimackenergy.com

CPUC Decision 21-06-035 Overview



Together, Building
a Better California



Overview of CPUC Decision 21-06-035

- Requires procurement of at least 11,500 MWs of additional net qualifying capacity (NQC) by all load-serving entities (LSEs) to be online by June 1, 2026.
- Capacity requirements per year:
 - 2,000 MW by August 1, 2023
 - 6,000 MW by June 1, 2024
 - 1,500 MW by June 1, 2025
 - 2,000 MW by June 1, 2026
- Establishes specific categories of procurement
 - Zero-emissions generation, generation paired with storage, or demand response resources, required by 2025, not necessarily in 2025
 - Firm Zero-emitting resources
 - Long-duration storage resources
 - Any other non-fossil fueled resources



PG&E Mid-Term Reliability Phase 1 Summary

- In Phase 1 PG&E sought projects with August 1, 2023 and June 1, 2024 online dates.
- PG&E submitted an Advice Letter on January 21, 2022 for 9 projects, totaling 1,598.7 MW
- PG&E will continue to monitor the progress of these projects as they make additional deposits and move towards development.

Solicitation Overview



Together, Building
a Better California



Overview of Mid-Term Reliability RFO – Phase 2

- PG&E seeks resources to provide system-level qualifying **September** net qualifying capacity (NQC) for June 1 of 2024, 2025, and 2026. All resources will be expected to be considered incremental in counting towards PG&E's procurement responsibilities, as specified in the Decision.
- PG&E will accept offers for 3rd Party Owned projects and Utility Owned projects.
- PG&E is soliciting offers in all procurement categories in Phase 2 for 3rd Party Owned projects
 - Zero-emissions generation, generation paired with storage, or demand response resources
 - Firm Zero-emitting resources
 - Long-duration storage resources
 - Any other non-fossil fueled resources (specifically storage)
- PG&E is soliciting Utility Owned Offers using a Build Own Transfer (BOT) term sheet in the following categories
 - Long-duration storage resources
 - Any other non-fossil fueled resources (specifically storage)



PG&E Mid-Term Reliability Procurement Requirements

PG&E Specific Total Minimum Mid-Term Procurement Requirements (in NQC MW)

Type of Resource	2023	2024	2025	2026	Total
Zero-emissions generation, generation paired with storage, or demand response resources, required by 2025, not necessarily in 2025*	-	-	500	-	500
Zero-emitting resources**	-	-	-	200	200
Long-duration storage resources**	-	-	-	200	200
Any other type of non-fossil-fueled resource	400	1,201	300	-	1,901
Total	400	1,201	300	400	2,302

*The zero-emissions resources required to replace Diablo Canyon must be procured by 2025, but may occur in any of the years 2023-2025; therefore, the columns do not add to the total

**The LLT resource requirements are divided into half from long-duration storage and half from firm, zero-emitting generation resources.



Phase 2 Products and Resources

Product	Procurement Category	Example Resources ¹	Delivery Term (Years)	Minimum Size (MW)	Required Online Dates
Resource Adequacy (System, Local, Flex)	Zero Emitting	Co-located, Contractually Paired RPS and Storage, Hybrid RPS and Storage	10 or 15	10	By June 1, 2025
	Firm Zero Emitting	RPS-eligible Geothermal, Biomass	10 or 15	10	By June 1, 2026
	Long Duration Storage	Pumped Hydro Storage, Lithium-ion, Flow Battery, Compressed Air Energy Storage, etc.	10 or 15	10	By June 1, 2024 (battery), By June 1, 2026
	Other non-fossil fueled resources	Energy Storage	10 or 15	10	By June 1, 2024
All market attributes (Utility Ownership)	Long Duration Storage	Pumped Hydro Storage, Lithium-ion, Flow Battery, Compressed Air Energy Storage, etc.	10 or 15	10	By June 1, 2024 (battery), By June 1, 2026
	Other non-fossil fueled resources	Energy Storage	10 or 15	10	By June 1, 2024

¹Includes incremental capacity additions located at existing projects

Eligibility Requirements



Together, Building
a Better California



Resource Eligibility

- **Eligible Resources:**

- Zero Emitting Resources:

- (a) Be from a generation resource, a generation resource paired with storage (physically or contractually), or a demand response resource;

- (b) Be available every day from 5 p.m. to 10 p.m. (the beginning of hour ending 1800 through the end of hour ending 2200), Pacific Time, at a minimum; and

- (c) Be able to deliver at least 5 megawatt-hours of energy during each of these daily periods for every megawatt of incremental capacity claimed.

- Firm Zero Emitting Resources: RPS-eligible resource that has at least an 80% capacity factor, must not be use limited or weather dependent, cannot include storage

- Long Duration Storage Resources: must be able to deliver at maximum capacity for at least 8 hours

- Energy Storage “Other” Resources: must be at least 4-hours in duration and meet all applicable rules to count for Resource Adequacy

- **All Projects will be In-front of the meter projects except Demand Response.**



Zero Emitting Project Definitions

- **Zero Emitting Project configurations**
 1. **Co-located:** 2 separate CAISO resource IDs behind a single point of interconnection
 2. **Contractually Paired:** 2 separate CAISO resource IDs at two separate points of interconnection
 3. **Hybrid:** Paired generation + storage with 1 CAISO resource ID behind a single point of interconnection
- PG&E has a qualitative preference for Co-located resources in this category.
- Hybrid resource offers are asked to explain in Appendix B why the project prefers a Hybrid configuration as opposed to Co-located.
- Demand Response projects in this category are directed to fill out an Appendix B and submit it to the solicitation mailbox, explaining how the project will meeting the MTR Decision requirements and the additional guidance in the Energy Divisions FAQ response.



Resource Eligibility Cont.

- **Project Size:** The minimum size is 10 MW
- **Site Control:** Participants must demonstrate site control at the time of Offer Submission.
- **Performance & Operational Requirements:** Projects must meet the applicable CPUC and CAISO requirements to qualify for RA. The exception is the renewable generation component of paired zero emitting offers which can be Energy Only.
 - Projects must meet any other requirements that will enable PG&E to receive all the RA benefits
- **Electric Interconnection:** Participants must have documentation showing at a minimum that the Project is in the CAISO interconnection queue and on track to receive Full Capacity Deliverability Status (FCDS)
 - Projects will be evaluated qualitatively on their interconnection status. PG&E will prefer projects that are more advanced in the interconnection process with greater certainty on the ability to meet the online date requirements and greater certainty on transmission upgrade costs.
- **Incrementality:** Resources must be incremental to the 2019-2020 IRP RESOLVE/SERVM baseline used in need determination.
 - Resources would need to be contracted and approved by the Commission after June 30, 2020

Agreement Overview



Together, Building
a Better California



General Guidelines

Procurement category	Agreement type
Zero-emitting (co-located and contractually paired)	Zero Emitting term sheet AND Long Term Resource Adequacy Agreement with Energy Settlement
Zero- emitting (hybrid)	Zero Emitting term sheet AND Long Term Resource Adequacy Agreement with Energy Settlement AND Hybrid Zero Emitting term sheet
Firm zero-emitting	Firm Zero Emitting term sheet
Long-duration storage	Long-Term Resource Adequacy Agreement with Energy Settlement Build Own Transfer (BOT) term sheet
Energy storage	Long-Term Resource Adequacy Agreement with Energy Settlement OR Build Own Transfer (BOT) term sheet

Zero Emitting Term Sheet



Together, Building
a Better California



Transaction

- Zero-emitting term sheet outlines the commercial terms for renewable component
 - Includes compensation structure for co-located and contractually paired resources
 - Hybrid resources should use hybrid zero-emitting term sheet for compensation structure
- Product
 - All Energy, Green Attributes, and Capacity Attributes associated with the Project
- Seller acts as Scheduling Coordinator
 - Seller retains CAISO revenues



General commercial terms

- **Contract Quantity**
 - Seller commits to generating a certain amount of Energy every contract year
 - PG&E will pay less for any amount generated above Contract Quantity in a contract year
- **Guaranteed Energy Production**
 - Seller must generate at least 70% of Contract Quantity every year or pay damages for any shortfall
- **Renewable Energy Credits**
 - Seller will ensure the facility is able to generate RECs
- **Events of Default**
 - Failure to generate any Energy in a contract year
 - Failure to meet GEP and cure with payment of damages
 - Any default applicable to storage component



Compensation: co-located and contractually paired

- **Seller provides two \$/MWh prices:**
 - Proxy Contract Price
 - Meter Contract Price

- **Contract has a Settlement Amount every month:**
 - Proxy Payment minus Market Price Payment, plus
 - Meter Payment

- If Settlement Amount is positive, PG&E owes Seller the Settlement Amount;
- If Settlement Amount is negative, Seller owes PG&E the absolute value of Settlement Amount



Proxy Payment minus Market Price Payment

- Way for PG&E to capture CAISO market revenues
 - If Market Price > Proxy Contract Price, Seller pays PG&E that difference
 - If Market Price < Proxy Contract Price, PG&E pays Seller that difference
- **Proxy Payment:** Proxy Contract Price multiplied by Proxy Quantity
- **Market Price Payment:** Market Price multiplied by Proxy Quantity
 - Market Price is day ahead price at the settlement point
- Settlement occurs on **Proxy Quantity**
 - Defined as CAISO Day Ahead PIRP Forecast
 - Settlement occurs regardless of whether resource actually generated or not
- Settlement still occurs for negative prices, but utilizes a market price of \$0/MWh (PG&E does not incur cost of negative prices)



Meter Payment

- Meter Quantity is based on actual generation
- Utilizes traditional framework of tying payment to actual generation



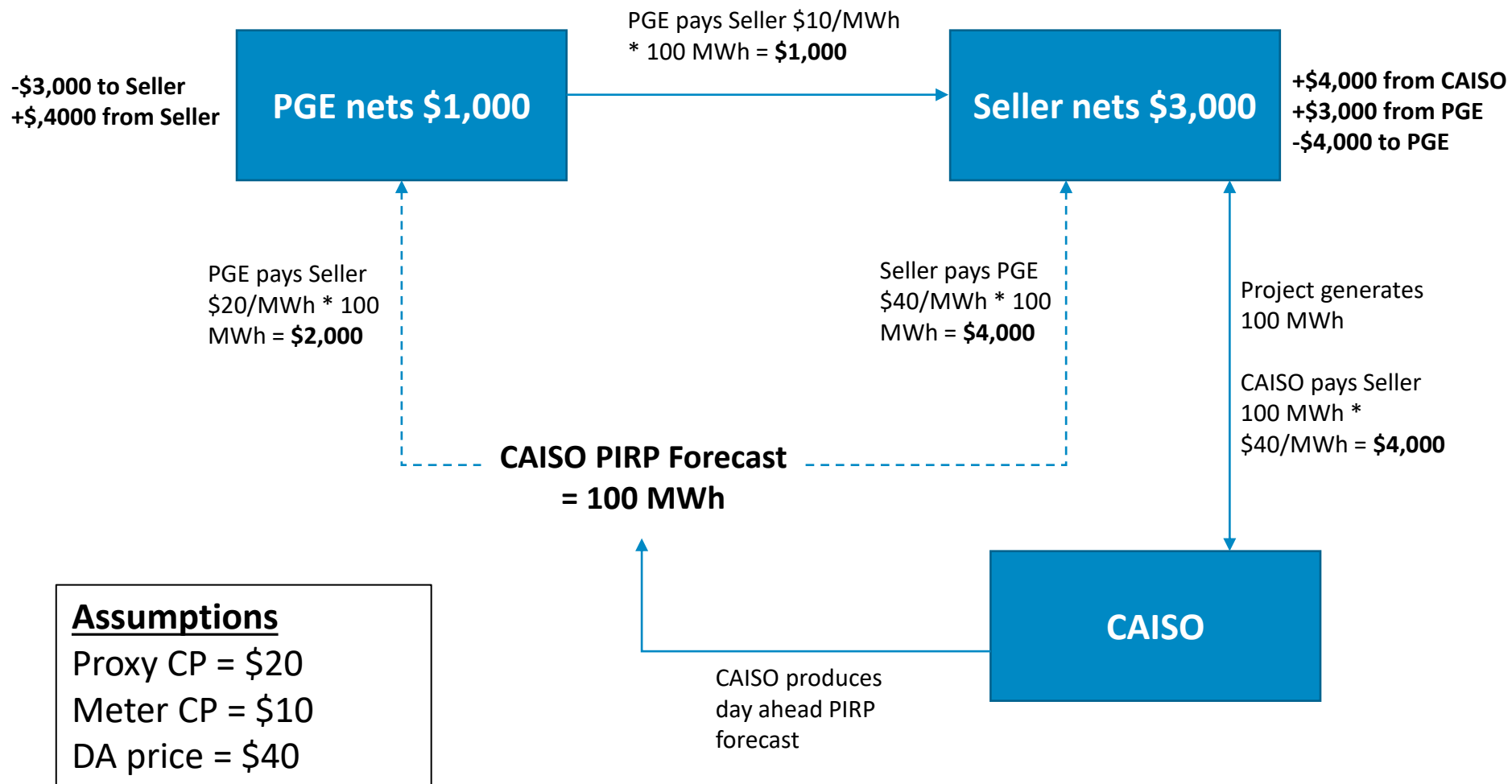
Example Settlement Amount

- Since Settlement Amount is negative, Seller owes PG&E \$1,000 for this interval

Proxy Quantity (CAISO DA PIRP forecast)	100 MWh
Proxy Contract Price	\$20 /MWh
Market Price	\$40 /MWh
Proxy Payment minus Market Price Payment	-\$2,000 \$
Meter Quantity	100 MWh
Meter Contract Price	\$10 \$/MWh
Meter Payment	\$1,000 \$
Settlement Amount	-\$1,000 \$



Example Settlement Amount: Flow of funds



Long Term RA Agreement with Energy Settlement



Together, Building
a Better California



Transaction

- Same form agreement from previous storage solicitations
- **Product:** All Capacity Attributes associated with the Project
 - System and local RA, plus any future defined characteristics that can be applied to Compliance Obligations
- Amount of Capacity Attributes is based on operational characteristics specified in Appendix III
 - Seller owes PG&E any attribute (current or future) that can be calculated from these characteristics
- Seller is Scheduling Coordinator
 - Seller retains CAISO revenues



Delivery of Product

- Seller must submit Supply Plans for all Capacity Attributes of the Product in each Compliance Showing
- If all Capacity Attributes of the Product are not delivered, the Payment Quantity will be reduced proportionately (Confirmed Quantity)
- Example of Confirmed Quantity calculation:

Payment Quantity	10 MW
Sum of Capacity Attributes of Delivered Quantities	7 MW
Sum of all Capacity Attributes of Product	10 MW

$$\text{Confirmed Quantity} = (7 \text{ MW}/10 \text{ MW}) \times 10 \text{ MW} = \mathbf{7 \text{ MW}}$$



Term, Early Termination & Events of Default

Early Termination Rights

- Either party may terminate if CPUC Approval is not received within 180 days of the latest filing date for such approvals

Events of Default

- Material misrepresentation in metering, Supply Plan or Notice of delivery of Product
- Seller must provide an average of at least 80% of all Capacity Attributes from the Project over rolling 12 months and an average of at least 85% of Capacity Attributes from the Project over rolling 24 months



Compensation

- **Compensation:** Monthly Payment in \$/kW-month based on Confirmed Quantity minus Energy Settlement
- **Energy Settlement**
 - Requires Seller to pay PG&E the difference between the highest priced hours and the lowest priced hours each day
 - Provides PG&E with the energy arbitrage value of the resource
- For any day, Energy Settlement is based on the “z” highest DA Energy Prices, with “z” representing the duration in hours of the resource
 - Payment Quantity * Max (0, ((Highest DA Energy Price – (Lowest DA Energy Price / round trip efficiency)) – VOM))
 - Seller bids VOM value as part of Offer Form

Hybrid Zero-Emitting Term Sheet



Together, Building
a Better California



Transaction

- Combines the general commercial terms of the zero-emitting term sheet and LTRAA w/ES
 - Delivery of Energy and Green Attributes (zero-emitting term sheet)
 - Delivery of Capacity Attributes (LTRAA w/ES)
- Compensation is a hybrid of the two agreements



Compensation

- Combination of two payments
 - Fixed Price: \$/kW-month based on Confirmed Quantity minus Energy Settlement
 - Variable Price: \$/MWh for Meter Quantity
- Energy Settlement
 - Seller pays PG&E the DA Energy price at the settlement point for the Proxy Quantity
 - Proxy Quantity is the generation shape Seller provides in the Offer
- Variable Price
 - PG&E pays Seller Variable Price for every MWh actually generated

Firm Zero-Emitting Term Sheet



Together, Building
a Better California



Transaction

- Follows the zero-emitting term sheet with enhanced provisions around delivering Capacity Attributes
- Product
 - All Energy, Green Attributes, and Capacity Attributes associated with the Project
- Seller acts as Scheduling Coordinator
 - Seller retains CAISO revenues



General commercial terms

- **Contract Quantity**
 - Seller commits to generating a certain amount of Energy every contract year
 - PG&E will pay less for any amount generated above Contract Quantity in a contract year
- **Guaranteed Energy Production:** Seller must generate at least 80% of Contract Quantity every year or pay damages for any shortfall
- **Renewable Energy Credits:** Seller will ensure the facility is able to generate RECs
- **Capacity Attributes:** Seller owes PG&E any capacity attribute (current or future) that can be calculated from specified operational characteristics
 - Seller should include any formulas/data for how ambient conditions may affect delivery of Capacity Attributes
 - Seller's payment will be adjusted if it does not deliver full amount of Capacity Attributes every month



Compensation (1/2)

- Same concept as current PG&E RPS PPAs, where PG&E pays a fixed price and receives the market revenues
- Seller provides one price
 - Meter Contract Price (\$/MWh) paid for every MWh actually generated
 - To the extent Seller's resource can provide more flexibility/dispatchability, a different structure may be negotiated
- Seller owes PG&E market revenues based on day-ahead price at settlement point (Market Price) for every MWh generated
 - If Market Price > Meter Contract Price, then Seller pays PG&E
 - If Market Price < Meter Contract Price, then PG&E pay Seller
- No settlement when prices are less than \$0/MWh



Compensation (2/2)

- Confirmed Quantity Ratio will be calculated for every month
 - Ratio of (all Capacity Attributes delivered) / (all Capacity Attributes calculated)
- Payment will be reduced proportionately if Confirmed Quantity Ratio < 1
 - No payment reduction if Confirmed Quantity Ratio is < 1 due to a planned outage during winter months (November to April)
- No planned outages in summer months (May to October)



Events of Default

- Failure to generate any Energy in a contract year
- Failure to meet GEP and cure with payment of damages
- Material misrepresentation in metering, Supply Plan or Notice of delivery of Product
- Seller must provide an average of at least 80% of all Capacity Attributes from the Project over rolling 12 months and an average of at least 85% of Capacity Attributes from the Project over rolling 24 months

Utility Owned Build Own Transfer Term Sheet



Together, Building
a Better California



Transaction

- **Product:** Minimum 10 MW power output as measured at the point of interconnection and a minimum duration of 8 hours for the long duration category and 4 hours for the 2024 online date category.
- **Compensation:** Participant will submit a Purchase Price in the Offer Form.
 - PG&E does not pay until the successful completion of all performance tests and satisfaction of all Closing conditions. PG&E will pay 100% of the Purchase Price at Closing.
- **Performance Guarantee:** Seller will provide Long Term Performance and Maintenance Agreement which will guarantee key operating characteristics



Project Requirements

- **Safety:**
 - All vendor's involved with the project must be in compliance with PG&E's Contractor Safety Program
 - Initial Site Safety Plan required by Execution Date
 - Includes description of potential hazards and risks to life, safety, public health, property, and environment
- **Specifications:** Project must be constructed following "Prudent Utility Practices." See "Storage Technology" section of BOT term sheet for definition.
- **Long Term Performance and Maintenance Agreement:**
 - Includes preventative and major maintenance work
 - Emergency Maintenance
 - Training for operations personnel
 - Monthly performance reporting
 - Remote monitoring

Intermission



Together, Building
a Better California

Q&A



Together, Building
a Better California