



GFO-23-503 Pre-Application Workshop

Feasibility of Underground Hydrogen Storage in California

Energy Research and Development Division, California Energy Commission

Presenter: Jeffrey Sunquist, Mechanical Engineer; Pooya Khodaparast, Utilities Engineer

Date: April 17, 2024



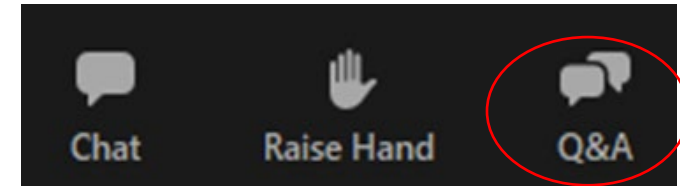
Agenda

Time	Item
2:00 p.m.	Welcome and Introduction
2:05 p.m.	Solicitation Background <ul style="list-style-type: none">• Gas R&D Program• Purpose of Solicitation• Available Funding
2:25 p.m.	Application Requirements <ul style="list-style-type: none">• Project Requirements• Attachments• Submission Process• Evaluation Process
3:00 p.m.	Questions & Answers
4:00 p.m.	Adjourn



Housekeeping

- This workshop will be recorded and posted to the CEC website at: <https://www.energy.ca.gov/event/funding-workshop/2024-04/pre-application-workshop-gfo-23-503-feasibility-underground-hydrogen>
- Attendees will be muted during the presentation. Please chat your question using the Q&A window.
- Updates to solicitation documents will be posted at the Grant Funding Opportunity's webpage: <https://www.energy.ca.gov/solicitations/2024-04/gfo-23-503-feasibility-underground-hydrogen-storage-california>





Commitment to Diversity

The Energy Commission adopted a resolution strengthening its commitment to diversity in our funding programs. The Energy Commission continues to encourage disadvantaged and underrepresented businesses and communities to engage in and benefit from our many programs.

To meet this commitment, Energy Commission staff conducts outreach efforts and activities to:

- Engage with disadvantaged and underrepresented groups throughout the state.
- Notify potential new applicants about the Energy Commission's funding opportunities.
- Assist applicants in understanding how to apply for funding from the Energy Commission's programs.
- Survey participants to measure progress in diversity outreach efforts.



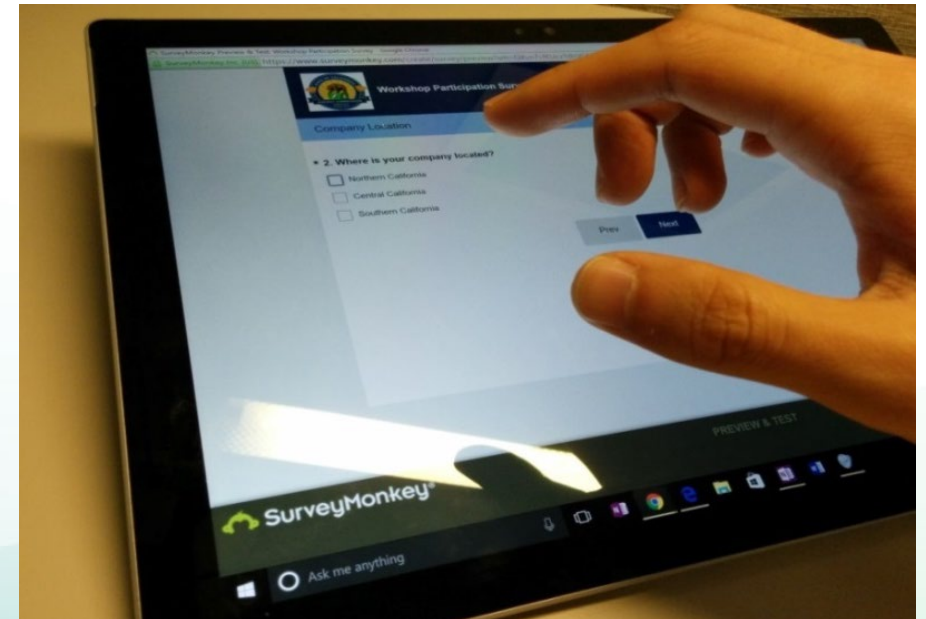
We Want to Hear From You!

Participation Survey

Survey responses will be summarized anonymously to track attendance of underrepresented groups in our workshops for public reporting purposes.

- Please use this link:
<https://forms.office.com/g/Kbq9GsJ2A8>

Thanks!





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Find a Partner on EmpowerInnovation.net

Empower Innovation strives to accelerate your clean tech journey with easy access to funding opportunities from the Energy Commission and other funding providers, curated resources and events, and connections to people and organizations.

<https://www.empowerinnovation.net/en/custom/funding/view/42742>

FIND A PARTNER

Announce your interest in this funding opportunity and message other interested parties to find potential partners.

RESOURCES & TOOLS

Browse the collection of resources for clean tech innovators including Resource Libraries, Funding Sources, Tools, and Databases.



EmpowerInnovation.net





Research Program Background

- Accelerate achievement of policy goals.
- \$24 million annual budget, funded by a gas consumption surcharge.
- Public interest R&D advancing decarbonization, safety and integrity of gas infrastructure.
- Support state energy policy and achieve equitable benefits.



Safety



Decarbonization



Equity



Policy Drivers

- **Senate Bill 1075, Hydrogen**
Tasks the CEC with assessing options for using hydrogen as part of California's decarbonization strategies.
- **Senate Bill 100, The 100 Percent Clean Energy Act of 2018**
Requires all retail sales of electricity in California to come from renewable and zero-carbon resources by 2045.
- **Senate Bill 32, California Global Warming Solutions Act of 2006**
Requires reductions of greenhouse gas emissions to 40% below 1990 levels by 2030.
- **CPUC Resolution G-3592**
Approved the FY22-23 Gas R&D budget with an initiative on assessing the safety and feasibility of geological hydrogen storage opportunities in California



Purpose of Solicitation

- Fund a project that will evaluate the technical and economic feasibility of using existing underground gas storage facilities to store clean renewable hydrogen¹ in California.
- Support California's decarbonization goals and energy reliability during the gas transition.

¹Refer to Section I.B. in the Solicitation Manual for the definition of *clean renewable hydrogen*



Available Funding

Available Funding	Minimum Award Amount	Maximum Award Amount
\$3,000,000	\$2,500,000	\$3,000,000



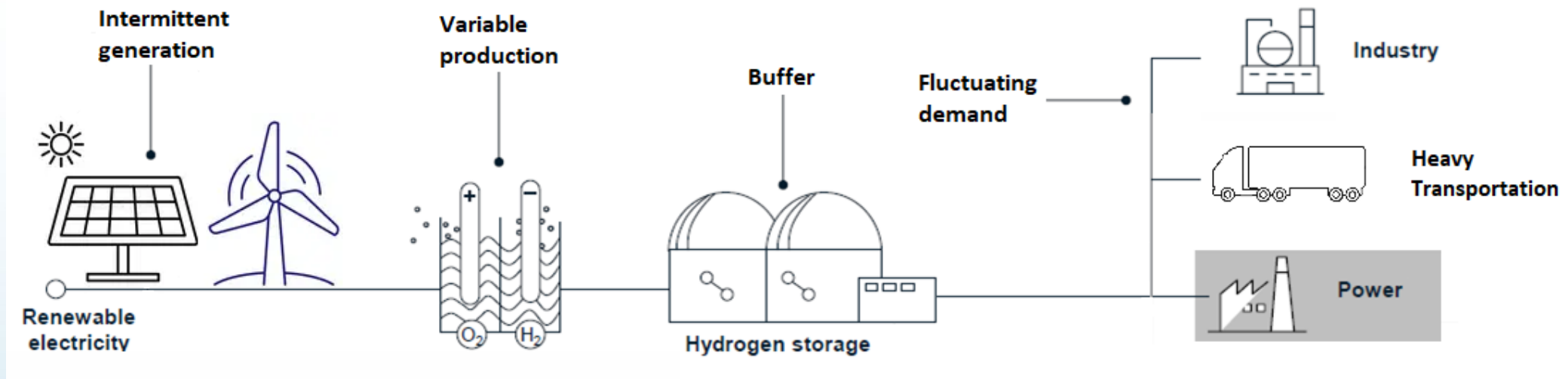
Match Funding

- 5% match funding is required.
- Applications that include match funding will receive additional points during the scoring phase.
- Match funding contributors must submit match funding commitment letters that meet the requirements. Failure to do so will disqualify the match funding commitment from consideration.
- Refer to the Solicitation Manual for more details on match funding.



Background

- Hydrogen may be used in hard-to-decarbonize applications.
- Large-volume hydrogen storage can play a critical role in balancing seasonal fluctuations in supply and demand similar to underground gas storage today.





Background (cont.)

- Above ground storage is uncertain to keep up with the growth of hydrogen production and demand.
- Underground gas storage reservoirs can potentially store more gas than above-ground storage, with a smaller surface footprint and lower cost.
- Site-specific assessments are needed to understand the safety and performance of converting underground gas storage to hydrogen.



Project Focus

- Develop technical and economic assessments for storing and retrieving hydrogen blends and/or pure hydrogen
- Study at least two existing underground gas storage facilities in California for their potential to store clean renewable hydrogen
- Geographically diverse sites are encouraged



Project Requirements

- Engage with local communities and Community Based Organizations (CBOs)
- Assess at least two sites for the potential impacts of introducing hydrogen
 - Well integrity impacts
 - Deliverability and reservoir dynamics
 - Necessary mitigations
- Small-scale pilot testing or field experiments are eligible but must include a robust risk mitigation strategy



Project Requirements (cont.)

- Quantitative risk assessment and techno-economic analysis
 - Compare costs and risks of potential use cases
 - Estimate levelized cost of hydrogen storage, levelized total capital costs, and operations and maintenance costs for the selected sites
- Develop recommendations for Gas IOUs, CBOs, policymakers, and relevant stakeholders



Optional Elements

- Compare the levelized cost and life-cycle emissions between underground hydrogen storage and alternative hydrogen storage options
- Examine potential of storing hydrogen in saline aquifers



Additional Requirements

- Include the following in Project Narrative (Attachment 2).
 - Provide relevant pre-existing information to support the selection of the existing underground gas storage facilities
 - Identify modeling and simulation tools, data sources, inputs, and assumptions and describe how these tools will complement the laboratory testing and field experiments.
 - Describe the experimental approach including the types of samples that will be collected from the field sites.
 - Describe the tests that will be performed and how these tests will inform the quantitative risk assessment.



Benefits

Examples for maximizing benefits to strengthen proposal:

- Reducing energy costs and mitigating supply/demand fluctuations
- Improving energy reliability and safety for vulnerable communities
- Reducing greenhouse gas emissions and criteria pollutants



Eligible Applicants

- This is an open solicitation for public and private entities.
- Applicants must accept applicable PIER terms and conditions.
 - Standard, UC, and DOE T&Cs available online: <https://www.energy.ca.gov/funding-opportunities/funding-resources>
- Applicants are encouraged to register with the California Secretary of State, as all recipients must be registered and in good standing to enter into an agreement with the Energy Commission: <http://www.sos.ca.gov>



Application Requirements

Each Applicant must complete and including the following:

1. Executive Summary (.docx)

2. Project Narrative (.docx)

3. Project Team (.docx, .pdf)

4. Scope of Work (.docx)

5. Project Schedule (.xlsx)

6. Budget (.xlsx)

7. CEQA Compliance Form (.docx)

8. Past Projects Information Form (.docx, .pdf)

9. Commitment and Support Letters (.pdf)

10. Project Performance Metrics

11. Applicant Declaration (.docx)

12. California Based Entity Form (.docx)



Project Narrative (Attachment 2)

- This is your opportunity to explain the entirety of the project. The narrative should explain:
 - Why is your project necessary and important to California?
 - What is your project approach and how will each major task be implemented?
 - How will the project be completed in the term proposed
 - How will the project outcomes benefit gas ratepayers?
 - Address the requirements for your group as described in Section I.C.

Respond to the scoring criteria described in Section IV.F.



Scope of Work (Attachment 4) and Project Schedule (Attachment 5)

- Tell us exactly what you are proposing to do in your project.
- Identify what will be delivered to the Energy Commission.
- Be sure to include in the technical tasks:
 - At least one product deliverable per task.
 - Address requirements in Section I.C. under Project Focus.
- Be sure to include in the Project Schedule (Attachment 5):
 - Product deliverables that correspond with the Scope of Work.
 - Realistic dates on when product deliverables can be completed.



Budget (Attachment 6)

- Identify how the Energy Commission funds and match funds will be spent to complete the project.
- Subrecipients receiving \$100,000 or more Energy Commission funds must complete a separate budget form.
- Ensure that all rates provided are **maximum** estimated rates for the entire project term and any potential increases are included.
- Travel Restrictions:
 - CEC funds should be limited to project task specific in-state travel.
 - Travel to conferences are generally not considered applicable travel for projects and should not use CEC funds.



Commitment and Support Letter Forms (Attachment 9)

- Follow guidelines provided for commitment and support letters.
 - Commitment letters are required for entities or individuals that are committing match funding, testing/demonstration sites, including the **Applicant** (prime).
 - Support letters describe a project stakeholder's interest or involvement in the project.
- All applicants must submit **at least one** support letter.
- Match funding must be supported by a match fund commitment letter(s).
- Any project partners that will make contributions to the project (other than match and sites) must submit a commitment letter.
- Limit to two pages per letter, excluding the cover page.



GFO Submission Requirements

- Applicants must have or must create a user account to submit a solicitation application. To create an account, please see the guidance **User Registration Instructions** at:

<https://www.energy.ca.gov/media/7893>

Note: One account manager per organization, but users can be added by account manager

- Applications must be submitted through the **Energy Commission Agreement Management System (ECAMS)** at: <https://ecams.energy.ca.gov/>

The screenshot displays the California Energy Commission website. At the top left is the logo, and at the top right is a search bar and a 'Sign In' button. Below the navigation bar is a 'Welcome!' message followed by 'Funding Opportunities' and a 'View Solutions' button. A large banner image shows a colorful bus, a wind turbine, solar panels, and a house. Below the banner is a paragraph: 'The California Energy Commission offers a variety of funding opportunities to advance the state's transition to clean energy and transportation through innovation, efficiency, and the development and deployment of advanced technologies.'

The main content area features six tiles:

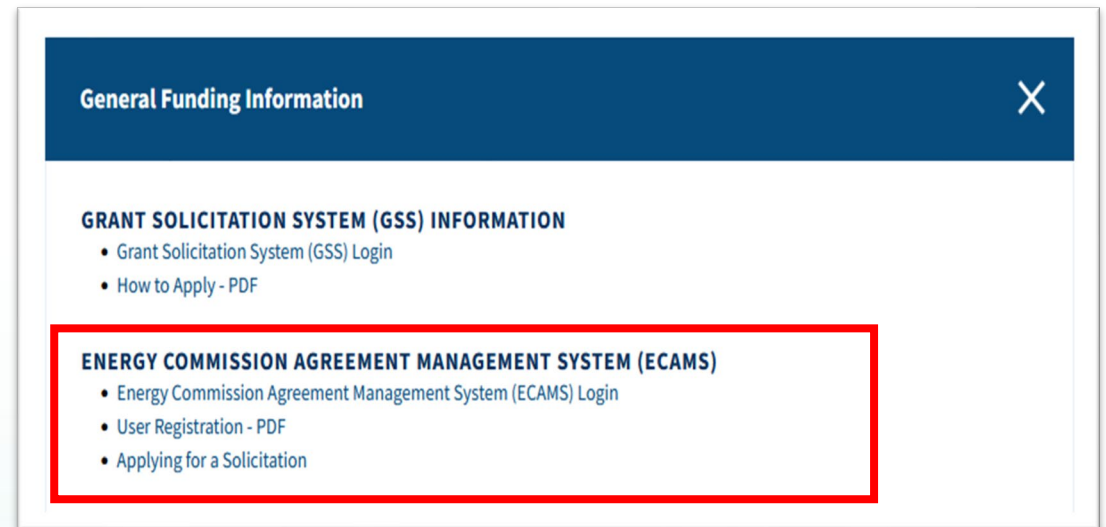
- Funding Workshops:** Find upcoming workshops to learn about solicitations, ask questions, network, and meet potential project partners.
- Awards:** Information about the California Energy Commission's awards, including notices of proposed awards and notices of selection.
- Funding Resources:** Guides, forms, templates, and other resources for individuals applying for funding opportunities that the California Energy Commission offers.
- ECAMS Grant Resources:** Templates, forms, and tools for the invoicing process and agreement management in general.
- Empower Innovation:** Empower Innovation is an initiative of the California Energy Commission, in partnership with leading California technology accelerators, fellowship programs, nonprofits, and private partners.
- Salesforce Training:** How to apply for solicitations and submit invoices.

At the bottom right, there is a 'Contact' section with the email address: ecams.salesforcesupport@energy.ca.gov



GFO Submission Requirements (cont.)

- For detailed instructions on application submittal, please see the *Applying for a Solicitation* at: <https://www.energy.ca.gov/media/7956>
- Both referenced guidance documents are available at: <https://www.energy.ca.gov/funding-opportunities/funding-resources> under General Funding Information.
- Questions with the ECAMS system should be directed to: ECAMS.SalesforceSupport@Energy.ca.gov

A screenshot of a web page titled "General Funding Information" with a close button (X) in the top right corner. The page is divided into two main sections. The first section is "GRANT SOLICITATION SYSTEM (GSS) INFORMATION" and contains two bullet points: "Grant Solicitation System (GSS) Login" and "How to Apply - PDF". The second section is "ENERGY COMMISSION AGREEMENT MANAGEMENT SYSTEM (ECAMS)" and contains three bullet points: "Energy Commission Agreement Management System (ECAMS) Login", "User Registration - PDF", and "Applying for a Solicitation". This second section is highlighted with a red rectangular border.



GFO Submission Requirements (cont.)

- Electronic files, other than those requiring signatures, must be consistent with the specific file format provided in the solicitation.
- Application documents should meet formatting requirements, and page recommendations as specified in the solicitation manual.
- Attachments requiring signatures (Application Form and Support/Commitment Letters) may be signed, scanned, and submitted in PDF format.



Submission Warning

START THE PROCESS EARLY!

- Applications must be fully submitted BEFORE the deadline listed in the solicitation manual.
- The ECAMS system will reject applications submitted after the deadline.
- Applications in the process of being submitted prior to the deadline will NOT be accepted after the deadline.
- ECAMS support is ONLY available from 8am – 4pm Monday-Friday.



Application Submission

- Register as a New User (if applicable)
- Log In
- 4-Step Application Submittal Process:
 1. Select Solicitation
 2. Enter Application Information
 3. Upload Files
 - Select documents for upload
 - Tag files with document type
 - Designate confidential documents (if applicable)
 4. Review and Submit
- Confirmation from ECAMS system that submission was successful

All steps must be complete BEFORE the submission deadline



Application Reminders

We recommend you carefully review your application before submission.

- Verify that all necessary documents have been uploaded.
- Verify that all documents uploaded are the accurate version you intend to submit as your final.
- Verify that your documents are not marked "confidential" unless the solicitation allows specific material to be confidential. Most solicitations do not allow submission of confidential information.
- Verify that your match commitment letters accurately reflect the match amounts included in your budgets, including the match provided by the prime applicant.
- Verify that support and commitment letters are included, if required.
- Verify that amounts entered within the system's budget (if any) concur with information included on uploaded budget worksheets.



How will my Application be Evaluated?

Application Screening

Admin Screening Process

- Energy Commission staff screens applications per criteria in Section IV.E.
- Criteria are evaluated on a pass/fail basis.
- Applicants must pass all screening criteria, or the application will be disqualified.

Some Reasons for Disqualification

- Application is not submitted by the specified due date and time.
- Application does not include one or more support letters.
- Application contains confidential material.



How will my Application be Evaluated?

Application Scoring

- **Evaluation Committee applies the scoring scale to the scoring criteria.**
- **Applications must obtain a minimum passing score of 52.5 points for Criteria 1-4 in order to continue evaluation.**
- **Applications must obtain a minimum passing score of 70 points for Criteria 1-7 in order to be considered for funding.**
- **Review Section IV of the manual and ensure the application provides a clear and complete response to each scoring criteria.**

Scoring Criteria	Maximum Points
1. Technical Merit	15
2. Technical Approach	25
3. Impacts and Benefits for CA IOU Ratepayers	20
4. Team Qualifications, Capabilities, and Resources	15
5. Budget and Cost-Effectiveness	10
6. CEC Funds Spent in California	5
7. Ratio of Direct Labor Costs to Indirect Costs	10
Total	100
Minimum Points to Pass	70



How will my Application be Evaluated?

Application Scoring – Preference Points

- **Passing applications (score of 70 or more from Criteria 1-7) will be considered for bonus points. Criteria for bonus points include:**
 - **Match Funding**
 - **Disadvantaged Communities**
 - **California Based Entities**

Scoring Criteria	Maximum Points
8. California Based Entities Funding	5
9. Match Funds	10
10. Disadvantaged & Low-income Communities	5
Total Bonus Points	20



9. Match Funding Preference Points

Applications may receive up to 10 additional preference points based on the criteria below:

- Up to 5 points will be awarded based on the percentage of proposed cash relative to the total match contributions using the Match Scoring Table in the Scoring Criteria.
- The remaining 5 points may be awarded to applications that exceed the minimum match requirements up to 100 percent using the Exceeds Minimum Match Scoring table.
- Refer to the Solicitation Manual for more details on the match funding scoring criteria.



10. Disadvantaged & Low-Income Communities

Applications may receive up to 5 additional preference points based on the criteria below:

- Describes economic impacts on low-income and disadvantaged communities.
- Describes how the project will increase access to clean energy or sustainability technologies.
- Provides additional letters of support.
- Refer to the Solicitation Manual for more details on this scoring criteria.



Next Steps After Grant Award

- **Notice of Proposed Award:** Shows total proposed funding amounts, rank order of applicants by project group, and the amount of each proposed award.
- **Agreement Development:** Proposal documents will be processed into a legal agreement.
- **Failure to Execute:** The Energy Commission reserves the right to cancel the pending award if an agreement cannot be successfully executed with an applicant.
- **Project Start:** Recipients may begin work on the project **only** after the agreement is fully executed (approved at an Energy Commission business meeting and signed by the Recipient and the Energy Commission).



Key Dates

Activity	Date
Solicitation Release	April 3, 2024
Pre-Application Workshop	April 17, 2024 at 2:00 p.m.
Deadline for Written Questions	April 19, 2024 at 5:00 p.m.
Anticipated Distribution of Questions and Answers	Week of May 6, 2024
Deadline for ECAMS Submission Support	Ongoing until June 28, 2024 at 4:00 p.m.
Deadline to Submit Applications	June 28, 2024, 2024 at <u>11:59 p.m.</u>
Anticipated Notice of Proposed Award Posting	Week of July 29
Anticipated Energy Commission Business Meeting	October 9, 2024
Anticipated Agreement Start Date	November 1, 2024
Anticipated Agreement End Date	September 30, 2027



Questions and Answers

- Please chat your question in the Question and Answers window or raise your hand and you will be called on to unmute yourself. Please remember to introduce yourself by stating your name and affiliation. (Feature found under the Participants panel)
- Keep questions under 2 minutes to allow time for others.
- Note that our official response will be given in writing and posted on the GFO webpage.



Additional Questions

Please send all questions related to GFO-23-503 to:

Crystal Willis

Commission Agreement Officer

1516 Ninth Street, MS-18

Sacramento, CA 95814

(916) 529-1108

Crystal.Willis@energy.ca.gov

Deadline to submit questions:

5:00 PM Friday, April 19, 2024



Thank You!

