

GFO-22-502 Pre-Application Workshop

Innovative Hydrogen Refueling Solutions for Heavy Transport Energy Research and Development Division, California Energy Commission Presenters: Peter Chen, Mei Chang Date: October 14, 2022



Time	ltem
10:00 am	Introduction and Housekeeping
10:05 am	 Background Solicitation Overview Purpose Groups and Project Requirements Available Funding
10:30 am	 Application Requirements Two-Phase Process Attachments Evaluation Process
11:00 am	Q&As
12:00 pm	Adjourn

Virtual Housekeeping

- This workshop will be recorded.
- Participants will be muted during the presentation until the Q&A session.
- Please enter questions in the Q&A window on Zoom.
- Updates on solicitation documents including this presentation will be posted at the Grant Funding Opportunity's webpage: <u>https://www.energy.ca.gov/solicitations/2022-10/gfo-22-502-</u> <u>innovative-hydrogen-refueling-solutions-heavy-transport</u>

Commitment to Diversity

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

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

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



Participation Survey

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

 Online participants, please use this link: <u>https://forms.office.com/g/UZVjsWwSzD</u>

Thanks!











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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.

FIND A PARTNER

RESOURCES & TOOLS

Announce your interest in this funding
opportunity and message other interestedBrowse the collection of resources for
clean tech innovators including Resource
Libraries, Funding Sources, Tools, andDetails and the secondDetails and the second

Databases.

https://www.empowerinnovation.net/en/custom/funding/view/35447#







- Executive Order B-55-18:
 - Achieve economy-wide carbon neutrality by 2045.
- Executive Order N-79-20:
 - 100% medium- and heavy-duty vehicles be zero-emission by 2045 for all operations where feasible and 2035 for drayage trucks.
 - 100% zero-emission off-road vehicles and equipment by 2035 where feasible.









- \$24 million annual budget, funded by a gas consumption surcharge.
- Fund R&D not adequately addressed by competitive or regulated entities.
- Support state energy policy and provide equitable benefits.
- Recent program plans include hydrogen R&D initiatives to decarbonize hard-to-reach end uses, including heavy transport.







Clean Transportation Program

- Established by Assembly Bill 118 (Nunez, 2007).
- Provides approximately \$95 million per year
- Extended to January 1, 2024 by Assembly Bill 8 (Perea, 2013).



California Budget Acts of 2021 and 2022

 The Budget Act of 2021 appropriated \$785 million from the General Fund to support infrastructure deployments and manufacturing projects for zero-emission light-duty and mediumand heavy-duty vehicles.



Beginning with FY 2021-22

- \$1.165 Billion
- Over 3 years

ZEV 2.0 Beginning with FY 2021-22

• \$2.415B

Over 5 years



Solicitation Overview

Innovative Hydrogen Refueling Solutions for Heavy Transport

GFO-22-502





- Advance innovative hydrogen refueling solutions to support fuel cell technologies in emerging heavy-duty on-road and off-road sectors.
 - Reduce hydrogen delivery and refueling costs
 - Improve reliability
 - Enable higher fill rates
 - Minimize energy losses

Examples of Innovative Hydrogen Refueling Solutions

- Flexible **mobile hydrogen refueler** technologies to enable fuel cell adoption for off-road applications that lack practical access to permanent stations.
- High flow rate gaseous or liquid systems to achieve fast refueling times for larger vehicles.
- Advanced compressors, cryopumps, chillers, or other components with higher efficiency, improved reliability, and/or lower capital costs.
- Innovative station configurations to reduce footprint, accelerate time to deploy, increase utilization, and/or integrate on-site renewable hydrogen production.



Project Group	Eligible Vehicle Types
Group 1: Mobile Off-Road Equipment	 Mobile agricultural equipment Construction equipment Mining equipment Airport ground support equipment Cargo handling equipment
Group 2: Emerging Off- Road Applications	 Freight locomotives Passenger locomotives or multiple units Commercial harbor craft Ocean-going vessels Aircraft
Group 3: MDHD On-Road Vehicles	 Trucks Buses Multi-modal solutions that support both MDHD on-road vehicles and other end-uses with shared equipment

Select a Group and Vehicle Type

- Select a Group based on the vehicle type(s) that the project aims to support using the proposed innovative hydrogen refueling solution.
- Justify choice based on potential market demand, duty cycle compatibility, and favorability of hydrogen fuel cells as a zero-emission pathway.
- Describe baseline use case, expected fueling performance required, and any unique operational considerations when transitioning to hydrogen.



- Address a gap in existing technology using the proposed innovative H2 refueling solution to better enable H2 as a decarbonization pathway for the chosen vehicle type.
- Aim to achieve improvements in at least one of the following target metrics.
- Identify other proposed targets important for economic and operational viability in the Project Performance Metrics (Attachment 11).

Metric	Research Target
Flow rate (average)	>8 kg/min
Hydrogen delivery and refueling costs	\$2 – 4/kg
Reliability (uptime)	>90%
Energy efficiency of hydrogen delivery (after production to vehicle tank) including losses from conditioning, distribution, and storage	>80%

Project Requirements (cont.)

- Conduct lab testing and/or demonstrations to validate the innovative H2 refueling solution.
 - Group 1 and Group 2 projects are highly encouraged but not required to propose demonstrations.
 - Group 3 projects must include demonstrations.
- Obtain the necessary permits, waivers, and approvals to conduct the lab testing and/or demonstration legally and safely.

Demonstration Project Requirements

- Acquire vehicle(s) to demonstrate real world performance using the innovative H2 refueling solution.
- Collect and provide the following data:
 - Number, type, date, and location of hydrogen refueling stations installed.
 - Nameplate capacity of the installed equipment, in kg/day of hydrogen.
 - Location type.
 - Total cost per refueling station, the subsidy from the CEC per refueling station, federal subsidy per refueling station, utility subsidy per refueling station, and privately funded share per refueling station.

Demonstration Project Requirements (cont.)

- Demonstrate the innovative hydrogen refueling solution over a minimum period of 12 months to collect data including, but not limited to the following:
 - Number of refueling sessions
 - Average refueling station downtime
 - Average refueling session duration
 - Average amount of hydrogen (kg) dispensed
 - Refueling rate (kg/min)
 - Delivery and refueling costs (\$/kg)
 - Energy consumption per unit of hydrogen refueled (kWh/kg)

Additional Project Requirements

- Quantify the performance and economics associated with the improved hydrogen refueling solution and inform future development and commercialization efforts.
- Disseminate findings to a variety of stakeholders including but not limited to government agencies, national labs, industry groups, hydrogen safety experts, standards bodies, and commercial fleets.



- Develop a Hydrogen Safety Plan in accordance with DOE's most recent public guidelines title Safety Planning for Hydrogen and Fuel Cell Projects, available at: https://h2tools.org/sites/default/files/Safety Planning for Hy drogen and Fuel Cell Projects.pdf
- Participate in design reviews with the Hydrogen Safety Panel.
- Report unintended hydrogen releases or incidents pursuant to California Health and Safety Code Section 25510(a) and public guidelines.



- Group 1 and 2 are funded by the Gas R&D Program.
- Group 3 is funded by the Clean Transportation Program and General Funds.

Project Group	Available Funding	Minimum Award Amount	Maximum Award Amount
Group 1: Mobile Off-Road Equipment	\$3,000,000	\$1,500,000	\$3,000,000
Group 2: Emerging Off-Road Applications	\$5,500,000	\$3,000,000	\$5,500,000
Group 3: MDHD On-Road Vehicles	\$8,000,000	\$2,000,000	\$4,000,000
Total	\$16,500,000		



- Match funding is required in the amount of at least **25%** of the requested CEC funds.
- Example Calculation:
 - An Applicant requests \$3,000,000 of CEC funds for a project.
 - They must contribute at least \$750,000 in match share.
- Applications with additional match and higher proportions of cash match will receive additional points during scoring.
- 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.



- Forgone Costs
- Discounted or Refunded Equipment Costs
- Vehicle Acquisition Costs applicants may use match funds to purchase or lease vehicles and are encouraged to leverage other programs for funding assistance (ex. CARB's CORE, HVIP, and upcoming Advanced Technology Demonstration and Pilots Solicitation)
- Hydrogen Fuel Costs applicants may use match funds to purchase hydrogen fuel and are encouraged to source low carbon hydrogen to maximize benefits.



- This is an open solicitation for public and private entities.
- Group 1 and Group 2 applicants must accept the PIER terms and conditions. Standard, UC, and DOE T&Cs available online: <u>https://www.energy.ca.gov/funding-opportunities/fundingresources</u>
- Group 3 applicants must accept the ZVI terms and conditions (Attachment 15).
- 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 CEC: <u>http://www.sos.ca.gov</u>

Two-Phase Evaluation Process

The evaluation process will consist of two phases:1) Pre-Application Abstract Screening and Scoring2) Full Application Screening and Scoring



Phase 1: Pre-Application Abstracts

Innovative Hydrogen Refueling Solutions for Heavy Transport

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Each Applicant must complete and include the following:

Pre-Application Abstract Form (Attachment 1A)

Pre-Application Abstract Project Summary (Attachment 2A)

Reference and Work Product Form (Attachment 9)

(Optional) Commitment and Support Letter Form (Attachment 10)

Pre-Application Abstract Project Summary (Attachment 2A)

- The abstract (limited to 5 pages) must provide:
 - A summary of the proposed project
 - Project readiness
 - Implementation schedule
 - Project benefits
 - Cost effectiveness
- Address the Pre-Application Abstract Scoring Criteria described in Section IV.F.

Reference and Work Products Form (Attachment 9)

- Provide references for CEC grants received by the Applicant or team in the last 10 years, or for similar/related types of projects completed in the last 10 years.
- Identify past projects that resulted in market-ready technology, advancement of codes and standards, and/or advancement of state energy policy.
- Indicate whether projects were successfully completed in a timely manner.

(Optional) Commitment and Support Letter Forms (Attachment 10)

- Commitment and support letters are optional for the Pre-Application Abstract.
- If the applicant has a site or match share commitment identified by this time and is able to prepare itself, or obtain, a commitment letter regarding the site or match share, the applicant is encouraged to include such a letter.



How will my Application be Evaluated? Pre-Application Abstract Screening

Admin Screening Process

- CEC staff screens Pre-Application Abstracts per criteria in Section IV.E.
- Criteria are evaluated on a pass/fail basis.
- Applicants must pass all screening criteria or the Pre-Application Abstract will be disqualified.

Some Reasons for Disqualification

- Pre-Application Abstract is not submitted by the specified due date and time.
- Pre-Application Abstract addresses more than one project group.



How will my Application be Evaluated? Pre-Application Abstract Scoring

- Evaluation Committee applies the scoring scale to the scoring criteria.
- Pre-Applications Abstracts must obtain a minimum passing score of 35 points in order to continue evaluation for the Full Application Phase.
- Review Section IV.F of the manual and ensure the application provides a clear and complete response to each scoring criteria.

Scoring Criteria	Maximum Points
1. Project Summary	25
Minimum Passing Score for Criterion 1	17.5
2. Project Readiness and Implementation Schedule	15
Minimum Passing Score for Criterion 2	10.5
3. Project Benefits and Cost Effectiveness	10
Minimum Passing Score for Criterion 3	7
Total	50
Minimum Points to Pass	35



Phase 2: Full Applications

Innovative Hydrogen Refueling Solutions for Heavy Transport

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Full Application Attachments (Group 1 and Group 2)

Group 1 and Group 2 applicants must complete and include the following:

Full Application Form (Attachment 1B)	CEQA Compliance Form (Attachment 8)
Executive Summary (Attachment 2B)	References and Work Products (Attachment 9)
Project Narrative (Attachment 3)	Commitment and Support Letters (Attachment 10)
Project Team (Attachment 4)	Project Performance Metrics (Attachment 11)
Scope of Work (Attachment 5) (Group 1 and Group 2 template)	Applicant Declaration (Attachment 12)
Project Schedule (Attachment 6) (Group 1 and Group 2 template)	California Based Entity (CBE) Form (Attachment 13)
Budget (Attachment 7)	



Group 3 applicants must complete and include the following:

Full Application Form (Attachment 1B)	CEQA Compliance Form (Attachment 8)
Executive Summary (Attachment 2B)	References and Work Products (Attachment 9)
Project Narrative (Attachment 3)	Commitment and Support Letters (Attachment 10)
Project Team (Attachment 4)	Project Performance Metrics (Attachment 11)
Scope of Work (Attachment 5) (Group 3 template)	Applicant Declaration (Attachment 12)
Project Schedule (Attachment 6) (Group 3 template)	Localized Health Impacts Information Form (Attachment 14)
Budget (Attachment 7)	

Project Narrative (Attachment 3)

- The project narrative (limited to 20 pages) is your opportunity to explain the entirety of the project address key questions:
 - 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?
 - o How will the project outcomes benefit California?
 - $_{\odot}$ How will the project address requirements described in Section I.C?
- Respond to the scoring criteria described in Section IV.F.



- Separate templates for Group 1 and Group 2 projects vs.
 Group 3 projects.
- **Group 3** applicants should refer to the Scope of Work Instructions for Group 3 (Attachment 16) for examples and additional directions.
- Tell us exactly what you are proposing to do in your project.
- Identify what will be delivered to the CEC.
- Be sure to include in the technical tasks:

 At least one product per task.
 Address requirements in Section I.C. under Project Focus.



- Separate templates for Group 1 and Group 2 projects vs.
 Group 3 projects.
- Be sure to include in the schedule:

 Products that correspond with the Scope of Work.
 Realistic dates on when products can be completed.



- Identify how CEC funds and match funds will be spent to complete the project.
- Subcontractors receiving \$100,000 or more CEC funds must complete a separate budget form.
- Ensure that all rates provided are **maximum** rates for the entire project term.
- Travel Restrictions:
 - CEC funds should be limited to lodging and any form of transportation (e.g., airfare, rental car, public transit, parking, mileage).
 - If an applicant plans to travel to conferences, including registration fees, they must use match funds.

CEQA Compliance Form (Attachment 8)

- Complete form to determine CEQA compliance obligations.
- Failure to complete the CEQA process in a timely manner may result in cancellation of a proposed award and allocation of funding elsewhere.

Commitment and Support Letter Forms (Attachment 10)

- Follow guidelines provided for commitment and support letters.

 Commitment letters are required for entities or individuals that are committing match funding or testing/demonstration sites, including the Prime applicant.
 - Support letters describe a project stakeholder's interest or involvement in the project.
- All applicants must submit at least one support letter.
- Any project partners that will make contributions to the project must submit a commitment letter.
- Limit to two pages per letter.



California Based Entities (CBE) Form (Attachment 13)

- Group 1 and Group 2 applicants must complete and submit this form.
- Not required for Group 3 applicants.
- Identify any CBEs as instructed in the form. Projects with CEC funds to CBEs are entitled preference points.

Localized Health Impacts Information Form (Attachment 14)

- Group 3 applicants must complete and submit this form.
- Not required for Group 1 or Group 2 applicants.
- CEC requires this information to assist in developing and publishing a localized health impacts report for the Clean Transportation Program.



How will my Full Application be Evaluated? Full Application Screening

Admin Screening Process

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

Some Reasons for Disqualification

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



How will my Full Application be Evaluated? Full Application Scoring

- Evaluation Committee applies the scoring scale to the scoring criteria.
- Full Applications must obtain a minimum passing score of 52.5 points for Criteria 1-4 in order to continue evaluation.
- Full Applications must obtain a minimum passing score of 70 points for Criteria 1-7 in order to be considered for funding.
- Review Section IV.H 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	20
4. Team Qualifications, Capabilities, and Resources	15
5. Budget and Cost-Effectiveness	10
6. CEC Funds Spent in California	10
7. Ratio of Direct Labor Costs to Indirect Costs	5
Total	100
Minimum Points to Pass	70



How will my Full Application be Evaluated? Full 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 & Low-income Communities
 - California Based Entities (Group 1 and Group 2 only)

Scoring Criteria	Maximum Points
8. California Based Entities (Group 1 and Group 2 only)	5
9. Match Funds	10
10. Disadvantaged & Low- income Communities	5
Total Bonus Points	20

Match Funding Points

- Applicants may receive up to 10 additional preference points based on the criteria below:
 - O 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.

Disadvantaged Communities and Low-Income Communities

- Projects with all test or demonstration sites located in disadvantaged and/or low-income communities and justifies how the project will benefit these communities may receive additional points.
- Applications must:
 - Identify economic impacts such as customer bill savings and job creations.
 - Increase access to clean energy or sustainability technologies
 - Have letters of support from technology partners, community-based organizations, environmental justice organizations, or other partners.

Identifying Disadvantaged Communities

These areas represent the **25% highest scoring census tracts in CalEnviroScreen**, along with other areas with high amounts of pollution and low populations.

https://oehha.ca.gov/calenviros creen/sb535



Identifying Low-Income Communities

Use CARB's Priority Population Map to determine AB 523 lowincome communities

https://www.arb.ca.gov/cc/capa ndtrade/auctionproceeds/comm unityinvestments.htm





- Method of Delivery is the Energy Commission Grant Solicitation System, available at: <u>https://gss.energy.ca.gov/</u>
- Electronic files must be in Microsoft Office Word (.doc, .docx) and Excel (.xls, .xlsx) formats, unless originally provided in solicitation in another format.
- Application documents should meet formatting requirements, and page recommendations.
- Attachments requiring signatures (Application Form and Support/Commitment Letters) may be scanned and submitted in PDF format.
- First-time users must register as a new user to access system.
- Grant Solicitation System (GSS) How to Apply presentation: <u>https://www.energy.ca.gov/media/1654</u>



START THE PROCESS EARLY!

- Applications must be fully submitted <u>BEFORE</u> the deadline listed in the solicitation manual
- The GSS system will shut off at the deadline
- Applications in the process of being submitted prior to the deadline will NOT be accepted after the deadline
- Applications will NOT be accepted after the deadline



- Register as a New User
- Log In
- 3 Step Application Process:
 - 1. Select Solicitation
 - 2. Upload Files
 - Select documents for upload
 - Tag files with document type
 - 3. Review and Submit

All three steps must be complete BEFORE the deadline

Next Steps After Proposal Evaluation

- Notice of Proposed Abstract Results (NOPAR): Shows pass/fail results of the pre-application abstract screening and scoring process.
- Notice of Proposed Award (NOPA): Shows rank order results of the full application screening and scoring process and the amount of each proposed award.
- Agreement Development: Proposal documents will be processed into a legal agreement.
- Failure to Execute: CEC 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 a CEC business meeting and signed by the Recipient and CEC).



Activity	Date
Solicitation Release	October 3, 2022
Pre-Application Workshop	October 14, 2022 at 10:00 am PST
Deadline for Written Questions	October 21, 2022 at 5:00 pm
Anticipated Distribution of Questions and Answers	Week of November 7, 2022
Deadline to Submit Pre-Application Abstracts	November 18, 2022 at <u>11:59 pm</u>
Anticipated Notice of Pre-Application Abstracts Results (NOPAR) Posting Date	January 11, 2023
Deadline to Submit Full Applications	February 24, 2023 at <u>11:59 pm</u>
Anticipated Notice of Proposed Award (NOPA) Posting	April 21, 2023
Anticipated CEC Business Meeting	July 12, 2023
Anticipated Agreement Start Date	July 31, 2023
Anticipated Agreement End Date	March 31, 2026



Three ways to ask questions:

- 1. Use the raise hand feature in Zoom:
 - Zoom phone controls:
 - *6 Toggle mute/unmute
 - *9 Raise hand
 - Introduce yourself by stating your name and affiliation
 - Keep questions under 3 minutes to allow time for others

- 2. Type questions in the Q&A Box in Zoom:
 - Please provide name and affiliation.
- 3. Submit written questions:
 - Send written questions to Brad.Worster@energy.ca.gov by October 21, 2022 at 5:00 pm

Note that an official CEC response will be provided in writing and posted on the GFO webpage in ~3 weeks.



Please send all questions related to GFO-22-502 to:

Brad Worster

Commission Agreement Officer 1516 Ninth Street, MS-18 Sacramento, CA 95814 (916) 897-1647 Brad.Worster@energy.ca.gov

Deadline to submit Questions: October 21, 2022 at 5:00 PM Deadline to submit Pre-Application Abstracts: November 18, 2022 at 11:59 PM Deadline to submit Full Applications: February 24, 2023 at 11:59 PM