**GRANT FUNDING OPPORTUNITY**

**Gas Pipeline Safety and Integrity Research to Support Decarbonization**

**Gas R&D Program**



**GFO-22-503 Addendum 1**

http://www.energy.ca.gov/contracts/index.html

**State of California**

**California Energy Commission**

[~~November 2022~~] **January 2023**

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| **Attachments**

|  |  |
| --- | --- |
| Attachment Number | Title of Section |
| 1 | Application Form ***(requires signature)*** |
| 2 | Executive Summary  |
| 3 | Project Narrative  |
| 4 | Project Team  |
| 5 | Scope of Work  |
| 6 | Project Schedule |
| 7 | Budget  |
| 8 | CEQA Compliance Form  |
| 9 | References and Work Product |
| 10 | Commitment and Support Letters ***(require signature)*** |
| 11 | Project Performance Metrics |
| 12 | Applicant Declaration ***(require signature)*** |
| 13 | California Based Entity (CBE) Form |

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# I. Introduction

## Purpose of Solicitation

The purpose of this solicitation is to fund gas pipeline safety and integrity research and support gas system decarbonization by developing and advancing technologies that can better inspect, monitor, and assess the condition of gas pipelines.

Much of California’s gas infrastructure system was built more than 50 years ago and is now reaching the end of its expected service life.[[1]](#footnote-2) The age of a pipeline can affect its safety and reliability, both because of the increased frequency of natural force exposure and the degradation of the pipeline materials over time.[[2]](#footnote-3) On January 9, 2018, a pipeline failure incident occurred in Montecito, California caused by heavy rains and localized flooding resulting in a fire and explosion due to the failure of a 22-inch transmission pipeline. The pipeline failure resulted in the release of 12 million cubic feet (MMcf) of gas.[[3]](#footnote-4) Pipelines impacted by natural force damages, such as the incident in Montecito, are particularly concerning because these large and unpredictable natural forces are difficult to anticipate.[[4]](#footnote-5) Pipeline and Hazardous Materials Safety Administration (PHMSA) data shows that approximately seven percent of incidents for both gas distribution and transmission pipelines can be attributed to natural force damages from 2010 to present. Reporting data shows that these natural forces include temperature extremes, heavy rains and flooding, earth movement, lightning, intrusive tree root growth, snow or ice accumulation, or high winds.[[5]](#footnote-6) Pipeline design and construction regulations require pipeline operators to identify, assess, and design for geotechnical conditions and anticipated meteorological events. Meanwhile, integrity management regulations require risk assessments in the form of in-person patrol programs conducted on an ongoing basis to identify all potential threats and integrity risk factors. These patrols are often conducted on a quarterly basis, and timing depends on the size of the line, operating pressures, class locations, terrain, seasonal weather conditions, and other relevant factors, which means that operators may not be able to locate leaks or ruptures until the line is physically inspected. Advanced monitoring technologies and data analytics are needed to assess the integrity of the gas system more efficiently and remotely in response to natural force damages and reduce the frequency of costly repairs and service interruptions.

Plastic pipelines are most frequently used for gas distribution networks due to favorable mechanical characteristics that include elasticity, tearing strength, and resilience to shocks and vibrations.[[6]](#footnote-7) By the end of 2021, there were over 802,937 miles of plastic main and over 53.4 million plastic services installed in distribution systems in the United States. Over 90% of plastic pipe gas distribution mains consists of polyethylene (PE) pipes with a wide range of pipe diameters.[[7]](#footnote-8) Like steel pipelines, the safety and integrity of plastic pipelines are significantly impacted by a broad range of risks and threats. For plastic pipelines, these risks and threats include third-party damages, natural hazards, age hardening of plastic material and components, and degradation of repairs over time. Typical plastic pipeline failures include slow crack growth, ductile rupture, and rapid crack propagation, all of which have the potential to contribute to fugitive methane emissions or result in catastrophic ignitions.[[8]](#footnote-9) Failure may also occur at the location where plastic pipes are joined together by fusion welding, with the main causes of failure being poor scraping, misalignments and contamination.[[9]](#footnote-10) In particular, California’s vintage plastic pipelines made with a type of PE called Aldyl-A have been identified by the California Public Utilities Commission (CPUC) as a major potential hazard due to their propensity for embrittlement, cracking, and rupture. In 2011, gas leaks in Aldyl-A pipelines resulted in two separate incidents, the ignition and destruction of a building in Cupertino and an explosion beneath a commercial intersection in Roseville, resulting in a seven-hour fire.[[10]](#footnote-11)

Structural integrity issues have been raised concerning the fabrication and inspection processes. The current practice for assuring the quality of plastic pipe systems relies on pressure testing and visual inspection of the pipes, fittings, and joints, which only examines the external surface and cannot provide evidence of embedded flaws or defects in plastic material. Non-destructive evaluation (NDE) methods were developed to help bridge the knowledge gap and to retain the integrity of the pipeline. A substantial amount of research has been undertaken on the use of NDE to inspect steel pipelines. The application of NDE for plastic pipe inspection, on the other hand, is still in its early stages. Furthermore, the technology developed for inspecting metal pipe systems is not always applicable to plastic pipe systems. There is a need to accelerate the development and demonstration of advanced NDE technologies for plastic pipeline inspection.

Conclusions drawn from gas pipeline accidents and incident data from PHMSA illustrate the importance of pipeline safety research to improve the safety and reliability of the gas system. Pipeline safety research will also inform the role of existing gas infrastructure that will play in the transition to a decarbonized future and accelerate California’s effort to decarbonize the state’s gas system. This solicitation aims to advance technologies to better evaluate the safety and integrity of existing gas infrastructure, which will serve as a basis to inform gas system decarbonization strategies, such as broad electrification and targeted use of renewable gas.

Projects must fall within the following project groups:

* **Group 1**: Monitoring and Risk Assessment for Natural Force Damage to Gas Pipelines; and
* **Group 2**: Plastic Pipeline Deficiency Inspection for Pipeline Integrity Management.

See Part II of this solicitation for project eligibility requirements. Applications will be evaluated as follows: Stage One proposal screening and Stage Two proposal scoring. Applicants may submit multiple applications, though each application must address only one of the project groups identified above. If an applicant submits multiple applications that address the same project group, each application must be for a distinct project (i.e., no overlap with respect to the tasks described in the Scope of Work).

Prospective applicants looking for partnering opportunities for this funding opportunity should register on the California Energy Commission’s (CEC) Empower Innovation website at www.empowerinnovation.net

## Key Words/Terms

|  |  |
| --- | --- |
| **Word/Term** | **Definition** |
| Applicant | The entity that submits an application to this solicitation. |
| Application | An applicant’s written response to this solicitation. |
| Authorized Representative | *Authorized Representative*, the person signing the application form who has authority to enter into an agreement with the CEC.  |
| CAM | *Commission Agreement Manager,* the person designated by the CEC to oversee the performance of an agreement resulting from this solicitation and to serve as the main point of contact for the Recipient. |
| CAO | Commission Agreement Officer |
| CBE | California Based Entity |
| CBO | Community Based Organization. A public or private nonprofit organization of demonstrated effectiveness that: 1. Has an office in the region (e.g., air basin or county) and meets the demographic profile of the communities they serve.
2. Has deployed projects and/or outreach efforts within the region (e.g., air basin or county) of the proposed disadvantaged or low-income community.
3. Has an official mission and vision statements that expressly identifies serving disadvantaged and/or low-income communities.
4. Currently employs staff member(s) who specialized in and are dedicated to – diversity, or equity, or inclusion, or is a 501(c)(3) non-profit.
 |
| CEC | State Energy Resources Conservation and Development Commission or, the California Energy Commission. |
| CEQA | California Environmental Quality Act, California Public Resources Code Section 21000 et seq. |
| Days | *Days refers to calendar days.* |
| Disadvantaged Community | [~~These are communities in the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations.~~~~(https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40)~~] **These are communities that represent the 25% highest scoring census tracts in CalEnviroScreen 4.0, census tracts previously identified in the top 25% in CalEnviroScreen 3.0, census tracts with high amounts of pollution and low populations, and federally recognized tribal areas as identified by the Census in the 2021 American Indian Areas Related National Geodatabase.****(**[**https://oehha.ca.gov/calenviroscreen/sb535**](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Foehha.ca.gov%2Fcalenviroscreen%2Fsb535&data=05%7C01%7C%7Cfe4f6bad102a408fb0be08daf5918dcc%7Cac3a124413f44ef68d1bbaa27148194e%7C0%7C0%7C638092302739240542%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=9kQLJ%2FsE%2BOrvOVHGt4UOVxRWUTInzX7fEiL6uS7Vex0%3D&reserved=0)**)**  |
| Gas IOU | *Gas Investor-owned utility,* including Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Gas Co. |
| GHG | Greenhouse gas |
| Low Income Community | *Low-income Communities* are defined as communities within census tracts with median household incomes at or below 80 percent of the statewide median income or the applicable low-income threshold listed in the state income limits updated by the Department of Housing and Community Development. (https://www.hcd.ca.gov/grants-funding/income-limits/state-and-federal-income-limits.shtml) |
| NDE | Non-Destructive Evaluation |
| Non-contact sensing and embedded sensing | Various technologies for monitoring potential causes of damage to pipelines or existing damage to pipelines. Non-contact sensing would typically occur outside the pipe, while embedded sensing would typically occur inside the pipe.  |
| NOPA | *Notice of Proposed Award,* a public notice by the CEC that identifies award recipients. |
| PE | *Polyethylene* |
| Pre-Commercial Technology | *Pre-commercial Technology* means a technology that has not reached commercial maturity or been deployed at scales sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable the appraisal of operational and performance characteristics, or of financial risks. |
| PHMSA | Pipeline and Hazardous Materials Safety Administration |
| Pilot Test | *Pilot test* means small scale testing in the laboratory or testing on a small portion of the production line of the affected industry. Pilot tests help to verify the design and validity of an approach, and adjustments can be made at this stage before full-scale demonstrations |
| Principal Investigator | The technical lead for the applicant’s project, who is responsible for overseeing the project; in some instances, the Principal Investigator and Project Manager may be the same person.  |
| Project Manager | The person designated by the applicant to oversee the project and to serve as the main point of contact for the CEC. |
| Project Partner | An entity or individual that contributes financially or otherwise to the project (e.g., match funding, provision of a test, demonstration or deployment site), and does not receive CEC funds.  |
| Recipient |  An entity receiving an award under this solicitation. |
| Solicitation | This entire document, including all attachments, exhibits, any addendum and written notices, and questions and answers (“solicitation” may be used interchangeably with “Grant Funding Opportunity”).  |
| State | State of California |
| TRL | Technology readiness levels, are a method for estimating the maturity of technologies during the acquisition phase of a program.Source: U.S. Department of Energy, “Technology Readiness Assessment Guide”. <https://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf> |

## Project Focus

**Group 1: Monitoring and Risk Assessment for Natural Force Damage to Gas Pipelines**

Projects must focus on the development and demonstration of novel technologies for geotechnical pipeline monitoring that include remote sensing or embedded sensing technologies that will inform long-term gas system planning.

Remote sensing is the process of monitoring the surface of the ground with satellites, unmanned aerial vehicle (UAV), or laser imaging, detection, and ranging (LIDAR) to analyze data and predict pipeline condition changes due to natural forces. The analysis will help determine reinforcements or other mitigation strategies to avoid potential impacts or pipeline failures.

Embedded sensing includes sensors such as fiber optic strain sensors to directly measure mechanical loads as well as to make geotechnical measurements along gas pipelines. Embedded sensing could also collect data such as the temperature, humidity, light, orientation, acceleration, inertial angular rotation, wind velocity, sound, pressure, strain, displacement, and tilt of the pipeline or substrate that the pipeline is in to assess and mitigate impacts to pipelines.

Projects must employ sensors and sensor data to directly measure or predict mechanical loads along gas pipelines and assess potential damages or failures before they occur. Projects may utilize modeling approaches and field sensor data to simulate the mechanical loads in pipeline systems subjected to natural forces and to determine potential damages or leakage rates. Additional modeling investigations may be necessary to estimate geotechnical changes using field-test-based methods in combination with laboratory tests.

Projects must support the development and demonstration of sensing and monitoring technologies with intelligent sampling and monitoring algorithms to detect concerning changes in pipeline conditions.

Projects must meet the following requirements:

* Demonstrate a complete system approach, including sensors, field data collection, data management and analysis, and risk assessment.
* Include direct measurement of stress/strain change along pipelines, or indirect measurement of ground movement surrounding pipelines, or a combination of both. For indirect measurements, the research must analyze field data to predict the changes in pipeline conditions.
* Demonstrate the advancement of technology and commercial readiness levels by enhancing device performance, improving modeling accuracy, increasing cost effectiveness, and demonstrating the technologies at full-scale in the field in partnership with gas utilities and pipeline owners and operators.
* Identify the proposed project demonstration location(s) in the application, which should reflect area(s) where transmission pipelines are at risk from natural force damages.
* Evaluate and demonstrate sensors and monitoring technologies at a Technology Readiness Level (TRL) [~~of 7~~] **between 5 and 7** or higher at the beginning of the project, with the potential to reach a TRL of **8 or** 9 by the end of the project.
* Demonstrate the sensors and monitoring technologies in the field for at least 12 months or more. Data collected during the demonstration must be used to quantify metrics including, but not limited to:
	+ Pipeline integrity improvement with quantifiable information for critical pipeline components, such as decrease in pipe failures attributed to improved monitoring technologies.
	+ Area surveyed or length of pipelines monitored.
	+ Overall improvement on performance metrics, costs savings, and GHG reduction.

The **Technical Merit** section of the **Project Narrative (Attachment 3)** should describe, at a minimum, how the applicant plans to address the following questions:

* How will the technology function effectively and consistently in diverse applications and use-cases where there are a variety of causes of natural force damages?
* What are the demonstration sites for the proposed technology and why were they selected? How will this new technology provide a solution to the risk imposed by the natural forces at the sites? Describe the rationale for the proposed technology and demonstration sites identified, including potential risks due to natural force damages.

The **Technical Approach** section of the **Project Narrative (Attachment 3)** should describe, at a minimum, how the applicant plans to address the following questions and requirements:

* What plans or strategies has the applicant identified or considered to continue demonstrating the technology, collecting data, and operating the system after the completion of the project? Provide a brief description of those plans.
* What commercialization milestones would the proposed technology try to achieve by the end of the project term? Identify the milestones and explain how to reach them.

**Group 2: Plastic Pipeline Deficiency Inspection for Pipeline Integrity Management**

Projects must focus on developing innovative laboratory and field tested NDE technologies that could provide a measure of the structural integrity of PE pipes and assess the structural health of in-situ conditions.

A reliable NDE should be able to identify different types of damages such as internal cracks, as well as different flaws or defects in material or from installation. Furthermore, it is crucial to ensure that high quality results can be replicated by different users. Differences in equipment, materials, joint configurations, and flaw types may require distinct practices, procedures, and trainings to reliably interpret the measurement results.

Projects must develop low-cost, high-precision non-destructive inspection technologies to evaluate the status of PE pipes, fittings, and joints. The prospective research findings should aid in assessing system integrity and informing strategic gas decommissioning opportunities.

Projects must meet the following requirements:

* Develop advanced NDE inspection technologies for PE pipes, fittings, and joints. The potential NDE methods may include microwave testing or ultrasonic testing.
* Demonstrate the advanced NDE inspection technology’s capability for measuring pipes across a range of diameters typical of gas distribution mains.
* Demonstrate high detectability of common flaws or irregularities that may be detrimental to a plastic pipe, fitting or joint.
* Incorporate distinct practices, procedures, and trainings to ensure that different users can produce replicable and accurate results. Inspection procedures should follow the applicable ASTM Standard of Practice or ISO NDT Inspection technical specifications.
* Demonstrate technologies with applications to gas plastic pipeline systems in California, especially gas services in disadvantaged and low-income communities.
* Evaluate and demonstrate NDE technologies at a TRL of 5 or higher at the beginning of the project, with the potential to reach a TRL of 8 or higher by the end of the project.
* Demonstrate the NDE technologies in the field and collect data to quantify metrics including, but not limited to:
	+ System integrity improvement through increased precision, accuracy, and reliability of measurements.
	+ Area surveyed or length of pipelines inspected.
	+ Cost savings and GHG reduction associated with the new pipe inspection technology and reducing risks of leaks.
	+ Reduced or avoided gas service interruption during pipeline repair.

The **Technical Merit** section of the **Project Narrative (Attachment 3)** should describe, at a minimum, how the applicant plans to address the following questions:

* How will the proposed project advance the research on plastic pipeline risk management in relation to gas utilities’ distribution integrity management programs?
* How can the proposed technologies, in conjunction with risk assessment models, be used to identify high-risk pipelines for potential gas decommissioning opportunities?

The **Technical Approach** section of the **Project Narrative** (**Attachment 3**) should describe, at a minimum, how the applicant plans to address the following questions and requirements:

* How will aforementioned technical requirements be designed and implemented to ensure commercial adoption in future use-cases and deployments? How will the applicants collaborate with gas utilities to advance the research and lead to increased adoption in California?
* How will the applicant ensure that the data collected about high-risk pipelines is shared with pipeline owners and operators? Provide a description for how data sharing will be conducted.

## Funding

1. **Amount Available and Minimum/ Maximum Funding Amounts**

There is **up to $4,000,000** available for grants awarded under this solicitation. The total, minimum, and maximum funding amounts for each project group are listed below.

| Project Group | Available funding | Minimum award amount | Maximum award amount | Minimum match funding(% of Gas R&D Funds Requested) |
| --- | --- | --- | --- | --- |
| Group 1: Monitoring and Risk Assessment for Natural Force Damage to Gas Pipelines | $3,000,000 | $1,500,000 | $3,000,000 | 20% |
| Group 2: Plastic Pipeline Deficiency Inspection for Pipeline Integrity Management | $1,000,000 | $750,000 | $1,000,000 | 20% |

1. **Match Funding Requirement**

Match funding is required in the amount of at least **20%** of the requested project funds.

For the definition of match funding see Section I. K.

1. **Change in Funding Amount**

Along with any other rights and remedies available to it, the CEC reserves the right to:

* Increase or decrease the available funding and the minimum/maximum award amounts described in this section.
* Allocate any additional or unawarded funds to passing applications, in rank order.
* Reallocate funding between any of the groups
* Reduce funding to an amount deemed appropriate if the budgeted funds do not provide full funding for agreements. In this event, the Recipient and Commission Agreement Manager will reach agreement on a reduced Scope of Work commensurate with available funding.

## Key Activities Schedule

Key activities, dates, and times for this solicitation and for agreements resulting from this solicitation are presented below. An addendum will be released if the dates change for activities that appear in **bold.**

| ACTIVITY | DATE | TIME[[11]](#footnote-12)  |
| --- | --- | --- |
| Solicitation Release | November 29, 2022 |  |
| **Pre-Application Workshop** | **December 13, 2022** | **10:00 a.m.** |
| **Deadline for Written Questions[[12]](#footnote-13)** | **December 23, 2022** | **5:00 p.m.** |
| Anticipated Distribution of Questions and Answers  | January 10, 2023 |  |
| **Deadline to Submit Applications** | **February 28, 2023** | **11:59 p.m.** |
| Anticipated Notice of Proposed Award Posting Date | *Week of April 3, 2023* |  |
| Anticipated Energy Commission Business Meeting Date | June 2023 |  |
| Anticipated Agreement Start Date | June 30, 2023 |  |
| Anticipated Agreement End Date  | June 30, 2026 |  |

## Notice of Pre-Application Workshop

CEC staff will hold one Pre-Application Workshop to discuss the solicitation with potential applicants. Participation is optional but encouraged. The Pre-Application Workshop will be held remotely. Applicants may attend the workshop via the internet (Zoom, see instructions below), or via conference call on the date and at the time and location listed below. Please call (916) 654-4381 or refer to the CEC's website at www.energy.ca.gov/contracts/index.html to confirm the date and time.

**Date and time:** December 13, 2022

**Zoom Instructions:**

To join the Zoom meeting, go to https://zoom.us/join and enter the Meeting ID below and select “join from your browser”. Participants will then enter the meeting password listed below and their name. Participants will select the “Join” button.

**Meeting ID:** 965 9191 3054

**Meeting Password:** 463017

**Topic:** Pre-Application Workshop for Gas Pipeline Safety and Integrity Research to Support Decarbonization Solicitation

**Telephone Access Only:**

Call **1-888 475 4499** (Toll Free) or **1-877 853 5257** (Toll Free). When prompted, enter the meeting number above. International callers may select a number from the Zoom International Dial-in Number List at: https://energy.zoom.us/u/adjzKUXvoy. To comment, dial \*9 to “raise your hand” and \*6 to mute/unmute your phone line.

**Access by Mobile Device:**

Download the application from the Zoom Download Center, https://energy.zoom.us/download.

**Technical Support:**

* For assistance with problems or questions about joining or attending the meeting,

please call Zoom Technical Support at **1-888-799-9666 ext. 2.** You may also contact the Public Advisor’s Office at publicadvisor@energy.ca.gov, or 800-822-6228.

* System Requirements: To determine whether your computer is compatible, visit:

 http://support.-zoom.us/hc/en-us/articles/201362023-System-requirements-for-Windows

* If you have a disability and require assistance to participate, please Erica Rodriguez by e-mail at Erica.Rodriguez@energy.ca.gov or (916) 654-4314 at least five days in advance.

## Questions

During the solicitation process, direct questions to the Commission Agreement Officer listed below:

Natalie Johnson, Commission Agreement Officer

California Energy Commission

715 P, MS-1

Sacramento, California, 95814

E-mail: Natalie.Johnson@energy.ca.gov

Applicants may ask questions at the Pre-Application Workshop, and may submit written questions via email. However, all **technical** questions must be received by the deadline listed in the “Key Activities Schedule” above. Questions received after the deadline may be answered at the CEC's discretion. **Non-technical** questions (e.g., questions concerning application format requirements or attachment instructions) may be submitted to the Commission Agreement Officer (CAO) at any time prior to 5:00 p.m. of the application deadline date.

The questions and answers will also be posted on the Commission’s website at: https://www.energy.ca.gov/funding-opportunities/solicitations

If an applicant discovers a **conflict, discrepancy, omission, or other error** in the solicitation at any time prior 5:00 p.m. of the application deadline date, the applicant may notify the CEC in writing and request modification or clarification of the solicitation. The CEC, at its discretion will provide modifications or clarifications by either an addendum to the solicitation or by written notice to all entities that requested the solicitation. At its discretion, the CEC may, in addition to any other actions it may choose, re-open the question/answer period to provide all applicants the opportunity to seek any further clarification required.

**Any verbal communication with a Commission employee concerning this solicitation is not binding on the State and will in no way alter a specification, term, or condition of the solicitation. Therefore, all communication should be directed in writing to the assigned CAO.**

## Applicants’ Admonishment

This solicitation contains application requirements and instructions. Applicants are responsible for **carefully reading** the solicitation, asking appropriate questions in a timely manner, ensuring that all solicitation requirements are met, submitting all required responses in a complete manner by the required date and time, and **carefully rereading** the solicitation before submitting an application. In particular, please carefully read the **Screening/Scoring Criteria and** **Grounds for Rejection** in Part IV, and the relevant Gas R&D Grant terms and conditions (formerly known as PIER Grant terms and conditions) located at: http://www.energy.ca.gov/research/contractors.html.

Applicants are solely responsible for the cost of developing applications. This cost cannot be charged to the State. All submitted documents will become publicly available records upon the posting of the Notice of Proposed Award.

In addition to any other right reserved to it under this solicitation or that it otherwise has, if the CEC determines, in its sole and absolute discretion, that if an agreement is not being successfully executed with an applicant in a timely manner, the CEC may cancel a proposed award and award funds to the next highest scoring applicant.

## Background

1. **Gas R&D Program[[13]](#footnote-14)**

This solicitation will award projects under the Gas R&D program (formerly PIER Natural Gas R&D program), which is funded by a ratepayer surcharge on gas consumed by ratepayers of Gas IOUs in California (see California Public Utilities Code section 890 and 895). The California Public Utilities Commission (CPUC) designated the CEC as administrator of the program in August 2004.[[14]](#footnote-15) The purpose of the program is to benefit California gas ratepayers by funding public interest research and development activities, which the CPUC has defined as “developing science or technology, the benefits of which accrues to California citizens and are not adequately addressed by competitive or regulated entities.”[[15]](#footnote-16)

1. **Program Areas, Strategic Objectives, and Funding Initiatives**

Gas R&D projects must fall within one or more specific focus areas (**“research initiatives”**) identified in the Gas R&D Budget Plan. This solicitation targets the following research initiative(s) from the Natural Gas R&D Budget Plan for Fiscal Year 2021/2022.[[16]](#footnote-17)

**The Natural Gas Research and Development Program: Proposed Budget Plan for Fiscal Year [~~2020-2021~~] 2021-2022**

* **Research Area**: Natural Gas Infrastructure Safety and Integrity
	+ **Research Initiative:** Technologies for Monitoring Ground Movement Around Pipelines and Mitigating Natural Force Damages.
	+ **Research Initiative:** Technology Development and Demonstration for Plastic Pipeline Repair and Integrity Improvement.
* **Applicable Laws, Policies, and Background Documents**

This solicitation addresses the energy goals described in the following laws, policies, and background documents.

Laws/Regulations

* **Assembly Bill (AB) 32[[17]](#footnote-18) - Global Warming Solutions Act of 2006**

AB 32created a comprehensive program to reduce greenhouse gas (GHG) emissions in California. GHG reduction strategies include a reduction mandate of 1990 levels by 2020 and a cap-and-trade program. AB 32 also designates the California Air Resources Board (CARB) as the state agency charged with monitoring and regulating sources of GHG emissions and requires CARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs. CARB must update the plan at least once every five years.

Additional information: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\_id=200520060AB32; https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan

Applicable Law: California Health and Safety Code §§ 38500 et. seq.

* **Senate Bill (SB) 32 - California Global Warming Solutions Act of 2006: emissions limit**

SB 32 expands on AB 32 by requiring that CARB ensure statewide GHG emissions are reduced to 40% below the 1990 level by no later than December 31, 2030. SB 32 further requires that these emission reductions are achieved in a manner that benefits the state’s most disadvantaged communities and is transparent and accountable to the public and the Legislature.

Additional information: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\_id=201520160SB32

Applicable Law: California Health and Safety Code § 38566.

* **CPUC General Order No. 112-F State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems (June 2015)**

Addresses the rules for utilities to design, construct, test, operate, and maintain piping systems beyond the requirements set by federal regulations. The 2015 revision included requiring the doubling of transmission inspections from once to twice a year and addressing encroachments on utility rights-of-way.

Additional information: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M163/K327/163327660.PDF

* **CPUC Resolution G-3571 (September 2021)**

This resolution approved the CEC requests of its Fiscal Year 2020-2021 gas research budget and put requirements on ensuring the safety of the gas system and decreasing fugitive methane emissions with a focus on mitigating natural force damage threats and improving plastic pipeline integrity.

Additional information: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M347/K955/347955274.PDF

* **Senate Bill 1371 - Natural Gas: Leakage Abatement (Leno, Chapter 525, Statutes of 2014)**

Requires the California Public Utilities Commission (CPUC) to determine whether existing practices are effective at reducing methane leaks and promoting public safety, and whether alternative practices may be more effective in reducing GHG emissions.

Additional information: http://www.leginfo.ca.gov/pub/13-14/bill/sen/sb\_1351-1400/sb\_1371\_bill\_20140822\_amended\_asm\_v91.pdf; https://ww2.arb.ca.gov/resources/documents/senate-bill-1371-natural-gas-leakage-abatement.

Policies/Plans

* **Integrated Energy Policy Report (Biennial)**

California Public Resources Code Section 25302 requires the Energy Commission to release a biennial report that provides an overview of major energy trends and issues facing the state. The IEPR assesses and forecasts all aspects of energy industry supply, production, transportation, delivery, distribution, demand, and pricing. The Energy Commission uses these assessments and forecasts to develop energy policies and provide recommendations for future research and analysis areas.

Additional information: http://www.energy.ca.gov/energypolicy

Applicable Law: California Public Resources Code § 25300 et seq.

* **Executive Order B-55-18**

Governor Brown’s Executive Order B-55-18 establishes a statewide policy to achieve carbon neutrality no later than 2045, and to subsequently reach and maintain net negative GHG emissions.

Additional Information: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf

* **CPUC Gas Safety Action Plan**

The Gas Safety Action Plan was created to guide and promote the CPUC’s shift in culture from the traditional compliance model to a regulatory structure that sets, monitors, and enforces rules for regulated utilities based on risk assessment and risk management. The Plan also tracks the CPUC’s implementation of improvements responsive to recommendations made by the Independent Review Panel and the National Transportation Safety Board in response to the tragic PG&E San Bruno pipeline explosion that occurred on September 9, 2010. As part of the Plan, the CPUC engages in an in-depth review of its current practices and procedures to seek areas for improvement in gas pipeline safety.

Additional information: https://www.cpuc.ca.gov/regulatory-services/safety/gas-safety-and-reliability-branch/safety-action-plan

Reference Documents

Refer to the link below for information about past CEC research projects and activities:

* http://www.energy.ca.gov/research/

## Match Funding

* **“Match funds”** includes cash or in-kind (non-cash) contributions provided by the applicant, subcontractors, or other parties including pilot testing, demonstration, and/or deployment sites (e.g., test site staff services) that will be used in performance of the proposed project.

“Match funds” do not include: CEC awards, future/contingent awards from other entities (public or private), the cost or value of the project work site, or the cost or value of structures or other improvements affixed to the project work site permanently or for an indefinite period of time (e.g., photovoltaic systems).

Definitions of “match funding” categories are listed below:

* + - **“Cash”** **match** means funds that are in the recipient’s possession or proposed by match partner and clearly identified in a support letter, and are reserved for the proposed project, meaning that they have not been committed for use or pledged as match for any other project. Cash match can include funding awards earned or received from other agencies for the proposed technologies or study (but not for the identical work). Proof that the funds exist as cash is required. Cash match will be considered more favorably than in-kind contributions during the scoring phase.
		- **“In-Kind”** **match** is typically in the form of the value of personnel, goods, and services, including direct and indirect costs. This can include equipment, facilities, and other property as long as the value of the contribution is based on documented market values or book values, prorated for its use in the project, and depreciated or amortized over the term of the project using generally accepted accounting principles (GAAP).
* **Match** funds must be spent only during the agreement term, either before or concurrently with CEC funds. Match funds also must be reported in invoices submitted to the CEC.
* All applicants providing match funds must submit commitment letters, **including prime and subcontractors**, that: (1) identify the source(s) of the funds; (2) justify the dollar value claimed; (3) provide an unqualified (i.e., without reservation or limitation) commitment that guarantees the availability of the funds for the project; and (4) provide a strategy for replacing the funds if they are significantly reduced or lost. Please see Attachment 11, Commitment and Support Letter Form. Commitment and support letters must be submitted with the application to be considered.
* Any match pledged in Attachment 1 must be consistent with the amount or dollar value described in the commitment letter(s) (e.g., if $5,000 “cash in hand” funds are pledged in a commitment letter, Attachment 1 must match this amount). Only the total amount pledged in the commitment letter(s) will be considered for match funding points.
* Examples of preferred match share:
	+ - **“Travel”** refers to all travel required to complete the tasks identified in the Scope of Work. Travel includes in-state and out-of-state, and travel to conferences. CEC funds are limited to lodging and any form of transportation (e.g., airfare, rental car, public transit, parking, mileage). Use of match funds for out-of-state travel is encouraged, as the CEC discourages and may not approve the use of its funds for such travel. If an applicant plans to travel to conferences, including registration fees, they must use match funds. Applicants shall adhere to travel restrictions of using state funds to travel to certain other states pursuant to AB 1887 (2016) and codified at California Government Code Section 11139.8. All applicants are encouraged to consider the Attorney General’s website https://oag.ca.gov/ab1887 for a current list of states subject to travel restrictions. Awarded Grants under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.
		- **“Equipment” is** an item with a unit cost of at least $5,000 and a useful life of at least one year. **Purchasing equipment with match funding is encouraged** as there are no disposition requirements at the end of the agreement for such equipment. Typically, grant recipients may continue to use equipment purchased with CEC funds if the use is consistent with the intent of the original agreement.
		- **“Materials”** under Materials and Miscellaneous are items under the agreement that do not meet the definition of Equipment (unit cost of at least $5,000 and a useful life of at least one year). **Using match funds for purchasing items such as laptops, notebooks and/or personal tablets is encouraged, as Energy Commission funds for these purchases is not allowed.**

## Funds Spent in California and California-Based Entities

* Only CEC reimbursable funds counts towards funds spent in California and funds spent on California-Based Entities totals.
* "Spent in California" means that:
	+ (1) Funds in the "Direct Labor category and all categories calculated based on direct labor (e.g., fringe benefits, indirect costs and profit) are paid to individuals that pay California state income taxes on wages received for work performed under the agreement. Payments made to out-of-state workers do not count as “funds spent in California.” However, funds spent by out-of-state workers in California (e.g., hotel and food) can count as “funds spent in California.”; AND
	+ (2) Business transactions (e.g., material and equipment purchases, leases, and rentals) are entered into with a business located in California.
	+ (3) Total should include any applicable subcontractors.
* Airline ticket purchases for out-of-state travel and payments made to out-of-state workers are not considered funds “spent in California.” However, funds spent by out-of-state workers in California (e.g. lodging) and airline travel originating and ending in California are considered funds “spent in California.” A business located in California means: 1) businesses registered with Secretary of State AND 2) transaction is with a location in California that is directly related to the grant project (e.g., direct purchase of material and equipment to be used in the grant) and results in the support of California business and jobs.
	+ Example 1: Grant funds will be spent on temperature sensors.  The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from a CA based supply house.  The invoice shows that the transaction occurred with the CA based supply house. This transaction is eligible and can be counted as funds spent in CA.
	+ Example 2: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from Texas.  The manufacturer has training centers in CA that instructs purchasers on how to use the sensors. The invoice shows that the transaction occurred in Texas. This transaction is not eligible and cannot be counted as funds spent in CA.
* Pursuant to California Public Resources Code Section 25620.5(h), the CEC’s Gas R&D Program must give priority to “California-Based Entities” (CBEs) when making awards. California Public Resources Code Section 25620.5(i) defines “CBE” as a corporation or other business entity organized for the transaction of business that either:
	+ Has its headquarters in California AND manufactures in California the product that is the subject of the award; or
	+ Has an office for the transaction of business in California and substantially manufactures the product or substantially performs the research within California that is the subject of the award.
* Applications must meet the following requirements in order to receive CBE preference points:
	+ The proposal must include a CBE as either the recipient or a subcontractor.
	+ The budget must show that the CBE(s) will receive more than 60.00% of the funds awarded.

# II. Applicant Eligibility Requirements

## Eligibility

This solicitation is open to all public and private entities. All projects in this solicitation must benefit Gas IOU ratepayers and California residents.

## Terms and Conditions

Each grant agreement resulting from this solicitation will include terms and conditions that set forth the recipient’s rights and responsibilities. By signing the Application Form (Attachment 1), each applicant agrees to enter into an agreement with the CEC to conduct the proposed project according to the terms and conditions that correspond to its organization, without negotiation: (1) University of California and California State University terms and conditions; (2) U.S. Department of Energy terms and conditions; or (3) standard terms and conditions. All terms and conditions are located at http://www.energy.ca.gov/research/contractors.html. Please refer to the applicable Gas R&D Grant terms and conditions (formerly known as PIER Grant terms and conditions). Failure to agree to the terms and conditions by taking actions such as failing to sign the Application Form or indicating that acceptance is based on modification of the terms will result in **rejection** of the application. Applicants **must** **read** the terms and conditions carefully.The CEC reserves the right to modify the terms and conditionsprior to executing grant agreements.

## California Secretary of State Registration

All corporations, limited liability companies (LLCs), limited partnerships (LPs) and limited liability partnerships (LLPs) that conduct intrastate business in California are required to be registered and in good standing with the California Secretary of State prior to its project being recommended for approval at an CEC Business Meeting.  If not currently registered with the California Secretary of State, applicants are encouraged to contact the Secretary of State’s Office as soon as possible to avoid potential delays in beginning the proposed project(s) (should the application be successful).  For more information, contact the Secretary of State’s Office via its website at www.sos.ca.gov.  Sole proprietors using a fictitious business name must be registered with the appropriate county and provide evidence of registration to the CEC prior to their project being recommended for approval at an CEC Business Meeting.

## Disadvantaged & Low-income Communities

In January of 2019, the California Public Utilities Commission (CPUC) Resolution G-3546 stated, “the Commission directs the CEC to enhance its engagement with disadvantaged communities.” In addition, the CPUC directed the Energy Commission to Incorporate an explicit long-term strategy for the role of the Gas R&D Program in the more aggressive statewide decarbonization goals set by Senate Bill 100 (De León, 2018) and Executive Order B-55-18.

The CEC is committed to ensuring all Californians have an opportunity to participate in and benefit from programs and services. While it is not required to complete the project within a disadvantaged community, demonstration projects located and benefiting disadvantaged and/or low-income communities will be considered under the scoring criteria for this GFO.

Low-income communities and households are defined as the census tracts and households, respectively, that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development (HCD). Visit the California Department of Housing & Community Development site for the current HCD State Income Limits: http://www.hcd.ca.gov/grants-funding/income-limits/index.shtml. Disadvantaged communities are defined as areas representing census tracts scoring in the top 25% in CalEnviroScreen. For more information on disadvantaged communities and to determine if your project is in a disadvantaged community, use the California Communities Environmental Health Screening tool (CalEnviroScreen): https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40.

1.

# III. Application Organization and Submission Instructions

## Application Format, Page Limits, and Number of Copies

The following table summarizes the application formatting and page limit recommendations:

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC’s waiver of the signature requirement appears here: https://www.energy.ca.gov/funding-opportunities/solicitations, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

|  |  |
| --- | --- |
| **Format** | * **Font:** 11-point, Arial (excluding Excel spreadsheets, original template headers and footers, and commitment or support letters)
* **Margins:** No less than one inch on all sides (excluding headers and footers)
* **Spacing:** Single spaced, with a blank line between each paragraph
* **Signatures**: Wet signatures only (i.e., not electronic)
* **File Format:** MS Word version 2007 or later (.doc or .docx format), excluding Excel spreadsheets and commitment or support letters (PDF files are acceptable for the letters)
* **File Storage:** Electronic files of the application must be submitted on a USB memory stick when submitting via **hard copy.**
 |
| **Maximum Page Limit Recommendations** | * **Executive Summary** (Attachment): **two** pages
* **Project Narrative Form** (Attachment): **twenty** pages excluding documentation for CEQA
* **Project Team Form** (Attachment): **two** pages for each resume
* **Reference and Work Product Form** (Attachment): **one** page for each reference, **two** pages for each project description
* **Commitment and Support Letter Form** (Attachment): **two** pages, excluding the cover page
* **Scope of Work** (Attachment): **thirty** pages
* **Project Schedule** (Attachment): **four** pages
* There are no page limits for the following:
	+ **Application Form** (Attachment)
	+ **Budget Forms** (Attachment)
	+ **CEQA Compliance Form** (Attachment)
	+ **Project Performance Metrics** (Attachment)
 |

## Method For Delivery

The only method of submitting applications to this solicitation is the CEC Grant Solicitation System (GSS), available at: https://gss.energy.ca.gov/. This online tool allows applicants to submit their electronic documents to the CEC prior to the date and time specified in this solicitation. Electronic files must be in Microsoft Word XP (.doc format) or newer and Excel Office Suite formats unless originally provided in the solicitation in another format.  Attachments requiring signatures may be scanned and submitted in PDF format.  Completed Budget Forms, (Attachment), must be in Excel format.

The deadline to submit grant applications through the CEC’s GSS is 11:59 p.m. The GSS system automatically closes at 11:59 pm. If the full submittal process has not been completed before 11:59 p.m., your application will not be considered. NO EXCEPTIONS will be entertained.

The CEC strongly encourages Applicants to upload and submit all applications by 5:00 p.m. because CEC staff will not be available after 5:00 p.m. or on weekends to assist with the upload process. And please note that while we endeavor to assist all would-be applicants, we can’t guarantee staff will be available for in-person consultation on the due date, so please plan accordingly.

Please give yourself ample time to complete all steps of the submission process: do not wait until right before the deadline to begin the process. Due to factors outside the CEC’s control and unrelated to the GSS system, upload times may be much longer than expected. For example, some past applicants experienced unexpected issues on their end, causing long delays that prevented timely submission. They spent significant time and resources on applications the CEC will not consider. Please plan accordingly. For instructions on how to apply using the GSS system, please see the How to Apply document available on the CEC website at: https://www.energy.ca.gov/media/1654.

First time users must register as a new user to access the system. Applicants will receive a confirmation email after all required documents have been successfully uploaded. A tutorial of the system will be provided at the pre-application workshop, and you may contact the Commission Agreement Officer identified in the Questions section of the solicitation for more assistance.

## Application Content

Below is a general description of each required section of the application. Completeness in submitting all the information requested in each attachment will be factored into application scoring.

1. Application Form (Attachment 1)

This form requests basic information about the applicant and the project. Please reference each individual attachment for a detailed description of the information requested by that attachment. The application must include an original Application Form that includes all requested information. The Application Form must be signed by an authorized representative of the applicant’s organization or will be failed as indicated in Section IV.E.

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC’s waiver of the signature requirement appears here: https://www.energy.ca.gov/funding-opportunities/solicitations, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

1. Executive Summary Form (Attachment 2)

The Executive Summary includes: a project description; the project goals and objectives to be achieved; an explanation of how the goals and objectives will be achieved, quantified, and measured; and a description of the project tasks and overall management of the agreement.

1. Project Narrative Form (Attachment 3)

This form will include the majority of the applicant’s responses to the Scoring Criteria in Section IV, including the following which must be addressed for both Applied Research & Technology Demonstration projects:

* 1. **Group Specific Questions**
		+ Include required group specific information (see Section I.C.) in the specified sections.
	2. **Project Readiness**
		+ Include information about the permitting required for the project and whether or not the permitting has been completed. If complete, provide appropriate documentation. If local jurisdiction CEQA review and project approval is not complete, applications must include information documenting progress towards and a schedule for achieving compliance under CEQA. All supporting documentation must be included in Attachment 8.
1. Project Team Form (Attachment 4)

Identify by name all key personnel[[18]](#footnote-19) assigned to the project, including the project manager and principal investigator (if applicable), and individuals employed by any major subcontractor (a major subcontractor is a subcontractor receiving at least 25% of Commission funds or $100,000, whichever is less). Clearly describe their individual areas of responsibility. Include the information required for each individual, including a resume (maximum two pages, printed double-sided).

1. Scope of Work Template (Attachments 5)

Applicants must include a completed Scope of Work for each project, as instructed in the template. The Scope of Work identifies the tasks required to complete the project. See requirements in section I.C.

Electronicfiles for the Scope of Work must be in **MS Word** file format**.**

1. Project Schedule (Attachment 6)

The Project Schedule includes a list of all product, meetings, and due dates. All work must be scheduled for completion by the “Key Dates” section of this solicitation manual.

Electronic files for the Project schedule must be in MS Excel file format.

1. Budget Forms (Attachment 7)

The budget forms are in MS Excel format. Detailed instructions for completing them are included at the beginning of Attachment 7.  **Read the instructions before completing the worksheets**. Complete and submit information on **all** budget worksheets. The salaries, rates, and other costs entered on the worksheets will become a part of the final agreement.

1. All project expenditures (match share and reimbursable) must be made within the approved agreement term. Match share requirements are discussed in Part I of this solicitation. The entire term of the agreement and projected rate increases must be considered when preparing the budget.
2. The budget must reflect estimates for **actual** costs to be incurred during the agreement term. The CEC may only approve and reimburse for actual costs that are properly documented in accordance with the grant terms and conditions. Rates and personnel shown must reflect the rates and personnel the applicant would include if selected as a Recipient.
3. The proposed rates are considered capped and may not change during the agreement term. The Recipient will only be reimbursed for **actual** rates up to the rate caps.
4. The budget must NOT include any Recipient profit from the proposed project, either as a reimbursed item, match share, or as part of overhead or general and administrative expenses (subcontractor profit is allowable, though the maximum percentage allowed is 10 % of the total subcontractor rates for labor, and other direct and indirect costs as indicated in the Category Budget form). Please review the terms and conditions and budget forms for additional restrictions and requirements.
5. The budget must allow for the expenses of all meetings and products described in the Scope of Work. Meetings may be conducted at the CEC or by conference call, as determined by the Commission Agreement Manager.
6. Applicants must budget for permits and insurance. Permitting costs may be accounted for in match share. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement with CEC funds, with the exception of costs incurred by University of California recipients.
7. The budget must NOT identify that CEC funds will be spent outside of the United States or for out-of-country travel.  However, match funds may cover these costs if there are no legal restrictions.
8. All applicants should go to the Attorney General’s website https://oag.ca.gov/ab1887 for a current list of states subject to travel restrictions. Grants awarded under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.
9. **Prevailing wage requirement:** Projects that receive an award of public funds from the CEC often involve construction, alteration, demolition, installation, repair or maintenance work over $1,000. For this reason, projects that receive an award of public funds from the CEC are likely to be considered public works under the California Labor Code. See Chapter 1 of Part 7 of Division 2 of the California Labor Code, commencing with Section 1720 and Title 8, California Code of Regulations, Chapter 8, Subchapter 3, commencing with Section 16000.

Projects deemed to be public works require among other things the payment of prevailing wages, which can be significantly higher than non-prevailing wages.

By accepting this grant, Recipient as a material term of this agreement shall be fully responsible for complying with all California public works requirements including but not limited to payment of prevailing wage. Therefore, as a material term of this grant, Recipient must either:

(a) Proceed on the assumption that the project is a public work and ensure that:

1. prevailing wages are paid; and
2. the project budget for labor reflects these prevailing wage requirements; and
3. the project complies with all other requirements of prevailing wage law including but not limited to keeping accurate payroll records, and complying with all working hour requirements and apprenticeship obligations;

or,

 (b) Timely obtain a legally binding determination from the Department of Industrial Relations or a court of competent jurisdiction before work begins on the project that the proposed project is not a public work.

1. California Environmental Quality Act (CEQA) Compliance Form (Attachment 8)

The CEC requires the information on this form to facilitate its evaluation of proposed activities under CEQA (California Public Resources Code Section 21000 et. seq.), a law that requires state and local agencies in California to assess the potential environmental impacts of their proposed actions. The form will also help applicants to determine CEQA compliance obligations by identifying which proposed activities may be exempt from CEQA and which activities may require additional environmental review. If proposed activities are exempt from CEQA (such as paper studies), the worksheet will help to identify and document this. This form must be completed regardless of whether the proposed activities are considered a “project” under CEQA.

Failure to complete the CEQA process in a timely manner after the CEC’s Notice of Proposed Award may result in the cancellation of a proposed award and allocation of funding elsewhere, such as to the next highest-scoring project.

1. Reference and Work Product Form (Attachment 9)
	* 1. Section 1: Provide applicant and subcontractor references as instructed.
		2. Section 2: Provide a list of past projects detailing technical and business experience

of the applicant (or any member of the project team) that is related to the proposed work. Identify past projects that resulted in market-ready technology, advancement of codes and standards, and/or advancement of state energy policy. Include copies of up to three of the applicant or team member’s recent publications in scientific or technical journals related to the proposed project, as applicable.

1. Commitment and Support Letter Form (Attachment 10)

A commitment letter commits an entity or individual to providing the service or funding described in the letter. A support letter details an entity or individual’s support for the project. Commitment and Support Letters must be submitted with the application. Letters that are not submitted by the application deadline will not be reviewed and counted towards meeting the requirement specified in the solicitation.

1. Commitment Letters

Applicants must submit a **match funding** commitment letter signedby eachrepresentative of the entity or individual that is committing to providing match funding. The letter should: (1) identify the source(s) of the funds; and (2) guarantee the availability of the funds for the project.

* If the project involves **pilot testing/ demonstration/ deployment** activities, the applicant must include a site commitment letter signed by an authorized representative of the proposed test/ demonstration/ deployment site. The letter must: (1) identify the location of the site (street address, parcel number, tract map, plot map, etc.) which must be consistent with Attachments 1 and 8. and (2) commit to providing the site for the proposed activities.
* **Project partners** that are making contributions other than match funding or a test/ demonstration/ deployment site, and are not receiving CEC funds, must submit a commitment letter signed by an authorized representative that: (1) identifies how the partner will contribute to the project; and (2) commits to making the contribution.
1. Support Letters

All applicants must include at least one support letter from a project stakeholder (i.e., an entity or individual that will benefit from or be involved in the project) that: (1) describes the stakeholder’s interest or involvement in the project; (2) indicates the extent to which the project has the support of the relevant industry and/or organizations; and (3) describes any support it intends (but does not necessarily commit) to provide for the project, such as funding or the provision of a test/ demonstration/ deployment site.

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC’s waiver of the signature requirement appears here: https://www.energy.ca.gov/funding-opportunities/solicitations, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

1. Project Performance Metrics (Attachment 11)

The purpose of this questionnaire is to identify and document 5-7 performance targets for the project. The performance targets should be a combination of scientific, engineering and techno-economic metrics that provide the most significant indicator of the research or technology’s potential success.

1. Applicant Declaration (Attachment 12)

This form requests the applicant declare that they: are not delinquent on taxes nor suspended by the California Franchise Tax Board; are not being sued by any public agency or entity; are in compliance with the terms of all settlement agreements, if any, entered into with the Energy Commission or another public agency or entity; are in compliance with all judgments, if any, issued against the Applicant in any matter to which the Energy Commission or another public agency or entity is a party; are complying with any demand letter made on the Applicant by the Energy Commission or another public agency or entity; and are not in active litigation with the Energy Commission regarding the Applicant’s actions under a current or past contract, grant, or loan with the Energy Commission. The declaration must be signed under penalty of perjury by an authorized representative of the applicant’s organization.

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC’s waiver of the signature requirement appears here: https://www.energy.ca.gov/funding-opportunities/solicitations, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

1. California Based Entity (CBE) Form (Attachment 13)

Identify any California-based entities as instructed in the form. California-based entities are entitled to a scoring preference as described in Part IV of this solicitation.

# IV. Evaluation and Award Process

## Application Evaluation

Applications will be evaluated and scored based on responses to the information requested in this solicitation and on any other information available, such as on past performance of CEC agreements. To evaluate applications, the CEC will organize an Evaluation Committee that consists primarily of CEC staff. The Evaluation Committee may use technical expert reviewers to provide an analysis of applications. Applications will be evaluated in two stages:

1. **Stage One: Application Screening**

The Contracts, Grants, and Loans Office and/or the Evaluation Committee will screen applications for compliance with the Screening Criteria in **Section E** of this Part. **Applications that fail any of the screening criteria will be rejected.**The Evaluation Committee may conduct optional telephone **Clarification Interviews** with applicants during the screening process to clarify and/or verify information submitted in the application. However, these interviews may not be used to change or add to the content of the original application. Applicants will not be reimbursed for time spent answering clarifying questions.

1. **Stage Two: Application Scoring**

Applications that pass Stage One will be submitted to the Evaluation Committee for review and scoring based on the Scoring Criteria in **Section F** of this Part.

* The scores for each application will be the average of the combined scores of all Evaluation Committee members.
* Clarification Interviews: The Evaluation Committee may conduct optional telephone interviews with applicants during the evaluation process to clarify and/or verify information submitted in the application. However, these interviews may not be used to change or add to the content of the original application. Applicants will not be reimbursed for time spent answering clarifying questions.
* **A minimum score of 70.0 points** is required for criteria 1-7- to be eligible for funding. In addition, the application must receive a minimum score of **52.50 points for criteria 1−4** to be eligible for funding.

## Ranking, Notice of Proposed Award, and Agreement Development

1. **Ranking and Notice of Proposed Award**

Applications that receive at least the minimum required score for all criteria will be ranked according to their score.

* CEC staff will post a **Notice of Proposed Award (NOPA)** that includes: (1) the total proposed funding amount; (2) the rank order of applicants; and (3) the amount of each proposed award. The CEC will post the NOPA at its headquarters in Sacramento and on its website, and will mail it to all entities that submitted an application. Proposed awards must be approved by the CEC at a business meeting.
* **Debriefings:** Unsuccessful applicants may request a debriefing after the release of the

NOPA by contacting the Commission Agreement Officer listed in Part I. A request for debriefing must be received **no later than 30 calendar days** after the NOPA is released.

* In addition to any of its other rights, the CEC reserves the right to:
	+ Allocate any additional funds to passing applications, in rank order; and
	+ Negotiate with successful applicantstomodify the project scope, schedule, project team entity that will receive the award, location and/or level of funding.
1. **Agreements**

Applications recommended for funding will be developed into a proposed grant agreement to be considered at a CEC Business Meeting. Recipients may begin the project only after full execution of the grant agreement (i.e., approval at a CEC business meeting and signature by the Recipient and the CEC).

* **Agreement Development:** The Contracts, Grants, and Loans Office will send the Recipient a grant agreement for approval and signature. The agreement will include the applicable terms and conditions and will incorporate this solicitation and the application by reference. The CEC reserves the right to modify the award documents (including the terms and conditions) prior to executing any agreement.
* **Failure to Execute an Agreement:** If the CEC is unable to successfully execute an agreement with an applicant in a timely manner, it reserves the right to cancel the pending award and use the funds elsewhere, such as to fund the next highest-ranked, eligible application.

## Grounds to Reject an Application or Cancel an Award

Applications that do not pass the screening stage will be rejected. In addition, the CEC reserves the right to reject an application and/or to cancel an award for any reason, including any of the following:

* The application contains false or intentionally misleading statements or references that do not support an attribute or condition contended by the applicant.
* The application is intended to erroneously and fallaciously mislead the State in any way.
* The application does not comply or contains caveats that conflict with the solicitation, and the variation or deviation is material.
* The applicant has previously received funding through an EPIC or Gas R&D (formerly Public Interest Energy Research (PIER)) agreement, has received the royalty review letter (which the CEC annually sends out to remind past recipients of their obligations to pay royalties), and has not responded to the letter or is otherwise not in compliance with repaying royalties.
* The applicant has received unsatisfactory agreement evaluations from the CEC or another California state agency.
* The applicant is a business entity required to be registered with the California Secretary of State and is not in good standing.
* The applicant has not demonstrated that it has the financial capability to complete the project.
* The applicant fails to meet CEQA compliance within sufficient time for the CEC to meet its encumbrance deadline or any other deadlines, as the CEC in its sole and absolute discretion may determine.
* The applicant has included a statement or otherwise indicated that it will not accept the terms and conditions, or that acceptance is based on modifications to the terms and conditions.
* The application contains confidential information or identifies any portion of the application as confidential.

## Miscellaneous

1. **Solicitation Cancellation and Amendment**

It is the policy of the CEC not to solicit applications unless there is a bona fide intention to award an agreement. However, if it is in the State’s best interest, the CEC reserves the right, in addition to any other rights it has, to do any of the following:

* Cancel this solicitation;
* Revise the amount of funds available under this solicitation;
* Amend this solicitation as needed; and/or
* Reject any or all applications received in response to this solicitation.

If the solicitation is amended, the CEC will send an addendum to all entities that requested the solicitation, and will also post it on the CEC’s website at: www.energy.ca.gov/contracts. The CEC will not reimburse applicants for application development expenses under any circumstances, including cancellation of the solicitation.

1. **Modification or Withdrawal of Application**

Applicants may withdraw or modify a submitted application before the deadline to submit applications by sending a letter to the Commission Agreement Officer listed in Part I. Applications cannot be changed after that date and time. An Application cannot be “timed” to expire on a specific date. For example, a statement such as the following is non-responsive to the solicitation: “This application and the cost estimate are valid for 60 days.”

1. **Confidentiality**

Though the entire evaluation process from receipt of applications up to the posting of the NOPA is confidential, **all submitted documents will become publicly available records** after the CEC posts the NOPA or the solicitation is cancelled. **The CEC will not accept or retain applications that identify any portion as confidential.**

1. **Solicitation Errors**

If an applicant discovers any ambiguity, conflict, discrepancy, omission, or other error in the solicitation, the applicant should immediately notify the CEC of the error in writing and request modification or clarification of the solicitation. The CEC will provide modifications or clarifications by written notice to all entities that requested the solicitation. The CEC will not be responsible for failure to correct errors.

1. **Immaterial Defect**

The CEC may waive any immaterial defect or deviation contained in an application. The CEC’s waiver will not modify the application or excuse the successful applicant from full compliance with solicitation requirements.

1. **Disposition of Applicant’s Documents**

Upon the posting of the NOPA, all applications and related materials submitted in response to this solicitation will become property of the State and publicly available records. Unsuccessful applicants who seek the return of any materials must make this request to the Agreement Officer listed in Part I, and provide sufficient postage to fund the cost of returning the materials.

## Stage One: Application Screening

|  |  |
| --- | --- |
| **Screening Criteria** ***The Application must pass ALL criteria to progress to Stage Two.*** | Pass/Fail |
| 1. **The application is received by the CEC’s Contracts, Grants, and Loans Office by the due date and time specified in the “Key Activities Schedule” in Part I of this solicitation and is received in the required manner (e.g., no emails or faxes).**
 | [ ]  Pass [ ]  Fail |
| 1. **The application Form (Attachment 1) is signed where indicated.**
 | [ ]  Pass [ ]  Fail |
| 1. **The Applicant Declaration Form (Attachment 12) is signed where indicated.**
 | [ ]  Pass [ ]  Fail |
| 1. **The application addresses only one of the eligible project groups, as indicated on the Application Form.**
 | [ ]  Pass [ ]  Fail |
| 1. **If the applicant has submitted more than one application for the same project group, each application is for a distinct project (i.e., no overlap with respect to the tasks described in the Scope of Work, Attachment).**

***If the projects are not distinct and the applications were submitted at the same time, only the first application screened by the CEC will be eligible for funding. If the applications were submitted separately, only the first application received by the CEC will be eligible for funding.*** | [ ]  Pass [ ]  Fail |
| 1. **The Application includes Commitment Letters that total the minimum of 20*%* in match share of the total requested CEC funds.**
 | [ ]  Pass [ ]  Fail |
| 1. ***If the project involves technology demonstration/ deployment activities***
* **The Application identifies one or more demonstration/ deployment site locations.**
* **The proposal includes a site commitment letter (Section III.D.11) for each demonstration/ deployment site.**
 | [ ]  Pass [ ]  Fail |

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC’s waiver of the signature requirement appears here: https://www.energy.ca.gov/funding-opportunities/solicitations, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

## Stage Two: Application Scoring

Proposals that pass ALL Stage One Screening Criteria and are not rejected as described in Section IV.C. will be evaluated based on the Scoring Criteria on the next page and the Scoring Scale below (with the exception of criteria 6−9, which will be evaluated as described in each criterion). Each criterion has an assigned number of possible points, and is divided into multiple sub-criteria. The sub-criteria are not equally weighted. The Project Narrative (Attachment) must respond to each sub-criterion, unless otherwise indicated.

**Scoring Scale**

|  |  |  |
| --- | --- | --- |
| % of Possible Points | Interpretation | Explanation for Percentage Points  |
| 0% | Not Responsive | Response does not include or fails to address the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable. |
| 10-30% | Minimally Responsive | Response minimally addresses the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable. |
| 40-60% | Inadequate | Response addresses the requirements being scored, but there are one or more omissions, flaws, or defects or the requirements are addressed in such a limited way that it results in a low degree of confidence in the proposed solution. |
| 70% | Adequate | Response adequately addresses the requirements being scored. Any omission(s), flaw(s), or defect(s) are inconsequential and acceptable. |
| 75% | Between Adequate and Good | Response better than adequately addresses the requirements being scored. Any omission(s), flaw(s), or defect(s) are inconsequential and acceptable. |
| 80% | Good | Response fully addresses the requirements being scored with a good degree of confidence in the applicant’s response or proposed solution. No identified omission(s), flaw(s), or defect(s). Any identified weaknesses are minimal, inconsequential, and acceptable. |
| 85% | Between Good and Excellent | Response fully addresses the requirements being scored with a better than good degree of confidence in the applicant’s response or proposed solution. No identified omission(s), flaw(s), or defect(s). Any identified weaknesses are minimal, inconsequential, and acceptable. |
| 90% | Excellent | Response fully addresses the requirements being scored with a high degree of confidence in the applicant’s response or proposed solution. Applicant offers one or more enhancing features, methods or approaches exceeding basic expectations. |
| 95% | Between Excellent and Exceptional | Response fully addresses the requirements being scored with a better than excellent degree of confidence in the applicant’s response or proposed solution. Applicant offers one or more enhancing features, methods or approaches exceeding basic expectations. |
| 100% | Exceptional | All requirements are addressed with the highest degree of confidence in the applicant’s response or proposed solution. The response exceeds the requirements in providing multiple enhancing features, a creative approach, or an exceptional solution. |

**Additional Screening Criteria for Past Performance**

| **Screening Criteria** |  |
| --- | --- |
| **Applicant Past Performance with CEC**The applicant—defined as at least one of the following: the business, principal investigator, or lead individual acting on behalf of themselves—received funds from the CEC (e.g., contract, grant, or loan) and entered into an agreement(s) with the CEC and demonstrated **severe performance issues** characterized by significant negative outcomes including:* Significant deviation from agreement requirements;
* Termination with cause;
* Demonstrated poor communication, project management, and/or inability, due to circumstances within its control, from materially completing the project;
* Quality issues with deliverables including poorly written final report that prevents publishing
* Severe unresolved negative audit findings.
 |  |
| **Must pass to continue with Scoring Criteria** | **Pass/Fail** |

**SCORING CRITERIA**

**The Project Narrative (Attachment 3)** must respond to each criterion below. The responses must directly relate to the solicitation requirements and focus as stated in the solicitation.

|  |  |
| --- | --- |
| Scoring Criteria | Maximum Points |
| 1. **Technical Merit**
2. The proposed project provides a clear and concise description of the technological, scientific knowledge advancement, and/or innovation that will overcome barriers to achieving the State’s statutory energy goals.
3. Describes the competitive advantages of the proposed technology over state-of-the-art (e.g., efficiency, emissions, durability, cost).
4. Provides the proposed technical specifications and describe how the project will meet or exceed the technical specifications by the end of the project.
5. Describes the technology readiness level (TRL) the proposed technology has achieved and the expected TRL by the end of the project.
6. Describes at what scale the technology has been successfully demonstrated, including size or capacity, number of previous installations, location and duration, results, etc.
7. Describes how the proposed demonstration will lead to increased adoption of the technology in California.
8. Provides information described in Section I.C.
 | **15** |
| 1. **Technical Approach**
2. Proposal describes the technique, approach, and methods to be used in performing the work described in the Scope of Work.
3. The Scope of Work identifies goals, objectives, and deliverables, details the work to be performed, and aligns with the information presented in Project Narrative.
4. Proposal identifies the reliability that the project and site recommendations as described will be carried out if funds are awarded.
5. Identifies and discusses factors critical for success, in addition to risks, barriers, and limitations (e.g., loss of demonstration site, key subcontractor). Provides a plan to address them.
6. Discusses the degree to which the proposed work is technically feasible and achievable within the proposed Project Schedule and the key activities schedule in Section I.E.
7. Describes the technology transfer plan to assess and advance the commercial viability of the technology.
8. Provides a clear and plausible measurement and verification plan that describes how the performance metrics and other benefits specified in the application will be determined and measured.
9. Provides information documenting progress towards achieving compliance with the California Environmental Quality Act (CEQA) by addressing the areas in Section I.I and Section III.D.3., and Section III.D.8
10. Provides information described in Section I.C.
 | **25** |
| 1. **Impacts and Benefits for California IOU Ratepayers and California Residents**
2. Explains how the proposed project will benefit California Gas Investor-Owned Utility (Gas IOU) ratepayers and California residents, and provides clear, plausible, and justifiable (quantitative preferred) potential benefits. Estimates the energy benefits including:
	* Energy cost reductions, infrastructure resiliency, infrastructure reliability, and methane leak reduction.

**In addition, estimates the non-energy benefits including:** * GHG emission reductions, air emission reductions (e.g. NOx), and/or increased safety.
1. States the timeframe, assumptions with sources, and calculations for the estimated benefits, and explains their reasonableness. Include baseline or “business as usual” over timeframe.
2. Explains the path-to-market strategy including near-term (i.e. initial target markets), mid-term, and long-term markets for the technology, size and penetration or deployment rates, and underlying assumptions.
3. Identifies the expected financial performance (e.g. payback period, ROI) of the demonstration at scale.
4. Identifies the specific programs which the technology intends to leverage.
5. Identifies how outputs of the tool will benefit key stakeholders (e.g., streamline planning, help eliminate barriers, stimulate growth of applicable market sectors).
 | **20** |
| 1. **Team Qualifications, Capabilities, and Resources**

Evaluations of ongoing or previous projects including project performance by applicant and team members will be used in scoring for this criterion. This can include contacting references.1. Identifies credentials of prime and any subcontractor key personnel, including the project manager, principal investigator and technology and knowledge transfer lead *(include this information in the Project Team Form).*
2. Demonstrates that the project team has appropriate qualifications, experience, financial stability and capability to complete the project.
3. Explains the team structure and how various tasks will be managed and coordinated.
4. Describes the facilities, infrastructure, and resources available that directly support the project.
5. Describes the team’s history of successfully completing projects in the past 10 years including subsequent deployments and commercialization.
 | **15** |
| **Total Possible Points for criteria 1− 4****(Minimum Passing Score for criteria 1− 4 is 70% or 52.50)** | **75** |
| 1. **Budget and Cost-Effectiveness**
2. Budget forms are complete for the applicant and all subcontractors, as described in the Budget instructions.
3. Justifies the reasonableness of the requested funds relative to the project goals, objectives, and tasks.
4. Justifies the reasonableness of direct costs (e.g., labor, fringe benefits, equipment, materials & misc. travel, and subcontractors).
5. Justifies the reasonableness of indirect costs (e.g., overhead, facility charges (e.g., rent, utilities), burdens, subcontractor profit, and other like costs).
 | **15** |
| 1. **CEC Funds Spent in California**

Projects that maximize the spending of CEC funds in California will receive points as indicated in the table below (see CEC Funds Spent in California and California-Based Entities section for more details).

|  |  |
| --- | --- |
| Percentage of CEC funds spent in CA vs Total CEC funds requested(derived from budget Attachment) | Percentage of Possible Points |
| >60%  | 20% |
| >65%  | 30% |
| >70% | 40% |
| >75%  | 50% |
| >80% | 60% |
| >85%  | 70% |
| >90% | 80% |
| >95%  | 90% |
| >98% | 100% |

 | **5** |
| 1. **Ratio of Direct Labor to Indirect Costs**

The score for this criterion will be calculated by the following formula:$$\frac{Total Direct Labor}{Total Direct Labor + Total Fringe + Total Indirect + Total Profit}$$This ratio will then be multiplied by the maximum possible points for this criterion and rounded to two decimal places.NOTE: For the purposes of this criterion, the CEC will include the facility charges (e.g., rent, utilities, etc.), burdens and other like costs that are budgeted as direct costs into the indirect costs in the formula. | **5** |
| **Total Possible Points****(Minimum Passing Score for Criteria 1 – 7 is 70% or 70.00)** | **100** |

| **Scoring Criteria** | **Maximum Points** |
| --- | --- |

|  |  |
| --- | --- |
| Preference Points Applications must meet both minimum passing scores (Scoring Criteria 1-4, and 1-7) to be eligible for the additional points. |  |
| 1. **California Based Entities (CBE) Preference Points**

Projects that maximize the spending of CEC funds on California Based Entities will receive points as indicated in the table below (see Funds Spent in California and California-Based Entities section for more details). Projects that meet these requirements will receive preference points as indicated below:

|  |  |
| --- | --- |
| **Percentage of Gas R&D Funds Allocated to CBEs**(derived from budget attachment “Category Budget”) | **Percentage of Possible Points** |
| > 60% | 20% |
| > 70%  | 40% |
| > 80%  | 60% |
| > 90%  | 80% |
| =100% | 100% |

 | **5** |
| 1. **Match Funds**
2. Cash match share is preferred; however, in-kind cost share is permitted and will be considered for solicitation match requirements. Points for this criterion will be evaluated based on the proposed cash match relative to the total match (cash + in-kind) contributions using the Cash Match Scoring Table:

**Cash Match Scoring Table**

| Percentage of Proposed Cash Match Funds | Score |
| --- | --- |
| 80 to 100% | 5 |
| 60 to <80% | 4 |
| 40 to <60% | 3 |
| 20 to <40% | 2 |
| 10 to <20% | 1 |

 | **5** |
| 1. Additional points will be awarded to applications that exceed the minimum match requirements based on the percentage amount above minimum using the Exceeds Minimum Match Scoring table:

**Exceeds Minimum Match Scoring Table**

| Percentage above Minimum Match (cash and in-kind) | Score |
| --- | --- |
| $\geq $ 80% | 5 |
| 60 to <80% | 4 |
| 40 to <60% | 3 |
| 20 to <40% | 2 |
| 10 to <20 % | 1 |

  | **5** |
| 1. **Disadvantaged & Low-Income Communities**

In order to receive or qualify for additional points, the proposed project must demonstrate benefits to the disadvantaged and/or low-income community in order to receive additional points. 1. Proposal identifies how the target market(s) will benefit disadvantaged and/or low-income communities.
2. Identifies economic impact on low-income and disadvantaged communities including customer bill savings, job creation, partnering and contracting with micro- and small-businesses, and economic development.
3. Describes how the project will increase access to clean energy or sustainability technologies within disadvantaged and/or low-income communities and how the development will benefit the communities.
4. Applicants have letters of support from technology partners, community based organizations, environmental justice organizations, or other partners that demonstrate their belief that the proposed project will lead to increased equity, and is both feasible, and commercially viable in the identified low-income and/or disadvantaged communities.
 | **5** |

1. California’s Gas System In Transition, 2019, *Equitable, Affordable, Decarbonized, and Smaller*. [↑](#footnote-ref-2)
2. Federal Register, 2022, *Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and other Geological Hazards*. [↑](#footnote-ref-3)
3. Federal Register, 2022, *Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards*. [↑](#footnote-ref-4)
4. PHMSA, 2022, *Fact Sheet: Natural Force Damage*. [↑](#footnote-ref-5)
5. PHMSA, 2022, *Gas Distribution and Gas Transmission Data*. [↑](#footnote-ref-6)
6. Sustainable and safe in exploitation of gas networks. Part 1. *Stress factors of plastic pipelines*, 2018, Electrotehnica, Electronica, Automatica (EEA), 2018, vol. 66 no. 4, pp. 66-72, ISSN 1582-5175. [↑](#footnote-ref-7)
7. Plastic Pipe Database Committee, 2022, *Plastic Piping Data Collection Initiative Status Report*. [↑](#footnote-ref-8)
8. California Public Utilities Commission (CPUC), 2014, *Hazard Analysis and Mitigation Report – Aldyl A Polyethylene Gas Pipelines*. [↑](#footnote-ref-9)
9. The University of Sheffield, 2015, *Fatigue Failure of Polyethylene Electrofusion Joints Subject to Contamination*. [↑](#footnote-ref-10)
10. SF Gate, 2011, *PG&E to Replace 1,200 Miles of Plastic Gas Pipe*. [↑](#footnote-ref-11)
11. Pacific Standard Time or Pacific Daylight Time, whichever is being observed. [↑](#footnote-ref-12)
12. This deadline does not apply to non-technical questions (e.g., questions concerning application format requirements or attachment instructions) or to questions that address an ambiguity, conflict, discrepancy, omission, or other error in the solicitation. Such questions may be submitted to the Commission Agreement Officer listed in Section G at any time prior to the application deadline. Please see Section G for additional information. [↑](#footnote-ref-13)
13. See Public Resources Code section 25620 https://leginfo.legislature.ca.gov/faces/codes\_displayText.xhtml?lawCode=PRC&division=15.&title=&part=&chapter=7.1.&article= [↑](#footnote-ref-14)
14. See CPUC Decision 04-08-010, August 19, 2004, http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/39314.PDF. [↑](#footnote-ref-15)
15. *Id.* at pp. 25 and 46. [↑](#footnote-ref-16)
16. 2021. *The Natural Gas Research Development and Demonstration Program: Proposed Program Plan and Funding Request for Fiscal Year 2021-22*. https://www.energy.ca.gov/publications/2021/natural-gas-research-and-development-program-proposed-budget-plan-fiscal-year [↑](#footnote-ref-17)
17. AB 32 (Statutes of 2006, chapter 488) [↑](#footnote-ref-18)
18. “Key personnel” are individuals that are critical to the project due to their experience, knowledge, and/or capabilities. [↑](#footnote-ref-19)