**GRANT FUNDING OPPORTUNITY**

**Paving the Way for California’s Gas Transition**

**Gas R&D Program**



**GFO-24-501**

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

**State of California**

**California Energy Commission**

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

# I. Introduction

## Purpose of Solicitation

The purpose of this solicitation is to fund applied research projects that meet the following initiatives:

* Location-Specific Analysis of Decommissioning to Support Long-Term Gas Planning (Gas Research and Development (R&D) Budget Plan FY 2021-2022)
* Scaled-Up Gas Decommissioning Pilots and Integrated Planning Tools (Gas R&D Budget Plan FY 2022-2023)

The State of California aims to greatly decrease reliance on fossil gas (commonly known to consumers as natural gas) over the next few decades, including by electrifying current gas end uses, decommissioning gas system infrastructure, reducing gas-fired power generation, and potentially by integrating lower-carbon gases into the utility gas system or deploying other alternatives to fossil gas. The focus of this solicitation is understanding and supporting both the prerequisites to and impacts of conversion from gas end uses in the residential and commercial sectors, considered in the context of a transition from fossil gas use overall.

Over 11 million homes and commercial buildings in California use gas, and electrification of gas end uses in these buildings is technically feasible. In many cases, however, electrification may not be practical or desirable from logistical, affordability, financial, equity, functional, energy system planning, or other perspectives. Additionally, there are hurdles to achieving primarily policy-driven, and ideally coordinated, change in a domain dominated by private, personal choices (Blazquez et al. 2020). Some of these issues are discussed in the California Public Utility Commission’s (CPUC) Long-Term Gas Planning Rulemakings (R.20-01-007, R.24-09-012),[[1]](#footnote-2) the California Energy Commission’s (CEC) *2021 Integrated Energy Planning Report (IEPR)*,[[2]](#footnote-3) the 2024 Joint Agency Staff Gas Transition White Paper *Progress Towards a Gas Transition,[[3]](#footnote-4)* and recent decommissioning research funded by the CEC (Gold-Parker et al, 2024; RAND, forthcoming). Research papers outline how the particularities of energy systems are embedded in society’s everyday practices (Jasanoff 2018; Watson and Shove 2023; Berquist and Lindmark 2023).[[4]](#footnote-5) Thus, for a successful energy transition, practices and materials in and across homes, business, markets, regulations, etc. must be reconfigured. This requires transformation across a diverse array of actual conditions and relationships, in contrast to the normative or simplified contexts that tend to be assumed in generic assessments of technological change. In recognizing these complexities, it becomes clear that providing end users with information and incentives will be insufficient to rapidly eliminate reliance on gas. Beyond the problem of motivating conversion from gas end uses, transition from gas will have a range of impacts not readily captured in aggregated analyses. To manage and partly mitigate undesirable impacts, policymakers need to better understand their character and likely distribution.

This solicitation funds research to address the challenges described above via empirically-based analysis that improves understanding of factors in societal, market, and technical systems that perpetuate fossil gas use in California homes and buildings and how these systems can be transformed to reduce reliance on gas.[[5]](#footnote-6) Results will help fill knowledge gaps and overcome weaknesses in approaches now limiting how well programs and policies are able to translate state goals into a successful transition on the ground, including by creating more effective problem framings that are sharable across transition participants. Funded research projects will identify, support, develop, or inspire technological, market, supply chain, investment, communications, implementation, or other innovations and improvements that can help motivate conversion from fossil gas to lower carbon alternatives. Findings will also contribute to the likelihood of positive outcomes from these conversions, formulate options to manage enduring barriers to conversion from gas, and inform infrastructure planning, including by improved consideration of locational considerations.

The remainder of this section gives more context for the types of analysis and perspectives sought for this funding opportunity. A series of general barriers to conversion away from gas are already known (e.g. installation costs, electricity rates in comparison to gas rates, functional and sociocultural preferences for gas, lack of awareness or knowledge about alternatives to gas, risk aversion, and concerns about energy reliability). A set of energy system transition challenges have also been identified (e.g., achieving targeted electrification to reduce decommissioning transition costs, building out an electricity system that reliably serves additional electric load, maintaining gas systems operations and safety throughout the transition, managing cost recovery and equity implications, and overcoming workforce limitations and potentially adverse impacts). Programs and projects dedicated to supporting the transition are contributing to learning how to overcome some of these barriers and challenges.

There has been little dedicated research, however, focused on the details of how these barriers function, or of how gas users, property owners, equipment installers, manufacturers, suppliers, vendors, and others involved in value chains for gas and gas-fired equipment figure into these barriers or into the persistence of gas use.[[6]](#footnote-7) Also largely missing are cohesive research-oriented conversations on how processes, systems, and technologies can be shaped over the coming decades to strengthen the individual and collective benefits of converting from gas and mitigate negative impacts while achieving the state’s planned energy transitions (see, e.g., Joint Agency Staff (2024), pp. 6-7, and CEC (2022), p. 6). The goal of this solicitation is to sponsor multidisciplinary and silo-bridging results and tools that help connect high-level transition expectations and programs with the on-the-ground complexity of transitioning away from an incumbent energy system, fossil gas.

Projects must fall within the following project groups:

* **Group 1**: Gas System Decarbonization and Decommissioning in Rural and/or Tribal Areas; and
* **Group 2**: Fieldwork and Analysis Across the Value Chain to Support Gas End Use Conversion.

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 Empower Innovation website at [www.empowerinnovation.net](https://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. |
| California Native American Tribe | A Native American Tribe located in California that is on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004 (Pub. Resources Code, § 21073). |
| California Tribal Organization | A corporation, association, or group controlled, sanctioned, or chartered by a California Native American tribe that is subject to its laws, the laws of the State of California, or the laws of the United States. |
| 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*, the person designated by the CEC to oversee the internal administrative processes and to serves as the main point of contact for solicitation applicants. |
| CBE | California Based Entity |
| CBO | *Community Based Organization*, a public or private nonprofit organization of demonstrated effectiveness that:   1. Has deployed projects and/or outreach efforts within the region (e.g., air basin or county) of the proposed disadvantaged or low-income community or similar community. 2. Has an official mission and vision statements that expressly identifies serving disadvantaged and/or low-income communities. 3. 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. |
| CEC funds | *CEC funds* are Gas R&D program grant funds awarded under this solicitation. Also referred to as grant funds. |
| CEQA | California Environmental Quality Act, California Public Resources Code Section 21000 et seq. |
| Days | *Days refers to calendar days.* |
| Disadvantaged Community | These are communities designated pursuant to Health and Safety Code section 39711 as representing the top 25% scoring census tracts from CalEnviroScreen along with other areas with high amounts of pollution and low populations as identified by the California Environmental Protection Agency.  (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40) |
| Gas IOU | *Gas Investor-owned utility,* including Pacific Gas and Electric Co., San Diego Gas and Electric Co., Southern California Gas Co., and Southwest 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) |
| Major Subrecipient | A Subrecipient that is budgeted to receive $100,000 or more of CEC funds, not including any equipment or match funds that may be provided by the Subrecipient. |
| NOPA | *Notice of Proposed Award,* a public notice by the CEC that identifies award recipients. |
| 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. |
| 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. |
| Rural Area | In the context of this solicitation, the precise definition of “rural area” is left to the applicant and should be consistent with common use of the term. Applicants to Group 1 proposing work in rural areas should summarize the criteria used for their determination, preferentially referring to a federal system to support their characterization of rural (e.g., systems used by the U.S. Census Bureau, U.S. Department of Agriculture, or U.S. Department of Health and Human Services.). |
| 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”). |
| Subrecipient | A person or entity that receives grant funds directly from a grant Recipient and is entrusted to make decisions about how to conduct some of the grant’s activities. A Subrecipient’s role involves discretion over grant activities and is not merely just selling goods or services. |
| Sub-Subrecipient | Has the same meaning as a Subrecipient except that it receives grant funds from a Subrecipient or any lower tier level of a Sub-Subrecipient. |
| 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> |
| Tribal Area | In the context of this solicitation, a tribal area is land that falls under the ownership, jurisdiction, or control of a California Native American Tribe, or a California Native American Tribe or other California Tribal Organization. The tribal area must be within the State of California. Tribal lands, defined as lands that constitute “Indian country,” as defined by 18 U.S.C. § 1151, or that otherwise fall under the ownership or jurisdiction of a Federally-recognized California Native American Tribe, would be considered as a tribal area for the purposes of this solicitation. |
| Vendor | A person or entity that sells goods or services to the grant Recipient, Subrecipient, or any lower-tiered level of Sub-Subrecipient, in exchange for some of the grant funds, and does not make decisions about how to perform the grant’s activities. The Vendor’s role is ministerial and does not involve discretion over grant activities. |

## Project Focus

**Group 1: Gas System Decarbonization and Decommissioning in Rural and/or Tribal Areas.**

The grant funded under this group will examine conversion from fossil gas (sometimes called “natural gas”) use for residential and commercial applications in rural and/or tribal areas in California, in recognition of the need for differentiated approaches to energy transitions depending on local circumstances (Jasanoff 2018), including with respect to:

* energy use as social practices[[7]](#footnote-8)
* energy system conditions
* transition impacts
* socioeconomics, and
* contractor and materials supply ecosystems in rural and tribal areas versus those in more urban areas.[[8]](#footnote-9)

Research funded by this solicitation will support an inclusive energy transition that negotiates these and other differences and that delivers compelling local benefits to communities and individuals in these areas.

For **at a minimum of three** communities in rural or tribal areas in California, research should investigate detailed conditions and circumstances of the selected communities, with a focus on residential and commercial gas use and users within each community, as related to the potential for converting from gas to electricity or other lower-carbon alternatives to fossil gas. **At least one** of these communities **must be located in the service territory of a Gas IOU**. Ideally, communities will be selected to represent a range of different conditions across the state.

For each community, the research should build thorough understanding of the frictions and barriers to conversion from gas and to identifying, where possible, changes that can reduce those frictions. Data collection and analysis must go beyond generic models of “levers” for electrification of gas end uses (i.e., general information and financial incentives) to create a fuller picture of the range of local decision contexts and how they can be influenced with respect to reducing or eliminating reliance on fossil gas. A range of end uses should be considered for each community. Analysis should include, but is not limited to:

* Community needs and concerns relevant to gas use and electrification, including with respect to estimated costs and risks of converting from fossil gas, equipment and materials supply and labor systems for equipment installation and repair, and willingness to reduce reliance on gas.
* Practices, interests, experiences, and capacities of gas end users and supply chain actors. For example, contractors and handypersons may prefer to replace equipment “like for like” for a variety of reasons.
* Equipment performance or functionality considerations and equipment replacement decision contexts given local needs and conditions and individual preferences or concerns, for example with respect to end uses, electricity reliability, building characteristics, economic impacts, and choice sets.
* Identification of achievable pathways that help assure that a transition away from gas truly benefits rural and tribal communities, including analysis of how these benefits and their communication can be improved, how negative impacts can be ameliorated, and how any enduring barriers to and/or undesired results from conversion from gas use can be managed. A basic assessment of timelines for these pathways should be included.
* Analysis of local energy system characteristics and needs as related to gas infrastructure; gas operations and safety; non-grid energy sources used (e.g., propane, wood, off-grid solar); electrification of gas end uses; electricity infrastructure including with respect to distribution and transmission; availability of distributed energy resources; the range of potential alternatives to fossil gas; and overall energy reliability, related critical services, and energy costs.
* Interpretation of how the findings from the study locations might apply to other rural or tribal locations.
* A summary of utility gas end use in rural and/or tribal areas in the state (e.g., based on distribution pipeline and usage data), with a preference for high granularity.

Successful applicants **must** demonstrate:

* Social scientific expertise on the research team, ideally including expertise from sociology, anthropology, social studies of technology, or similar disciplines.
* Relevant fieldwork expertise on the team, including capabilities and experience for planning and conducting in-depth interviews or observational studies, depending on what research is proposed. If surveys are to be used, expertise in survey development, fielding, and survey analysis should also be demonstrated.
* An understanding of current gas energy transition debates, policies, programs, and rulemakings, along with briefly addressing how the proposed research would coordinate these processes.

Projects in this group must, **at a minimum**:

* Analyze locations in rural or tribal areas in California that include residential and/or commercial premises that use fossil gas.
* Investigate at least three such locations, at least one of which is in the service territory of Gas IOU.
* Include data collection research elements based on site visits for each location.

Additionally, it is desirable that applicants funded in Group 1 will:

* Demonstrate familiarity with energy-related issues in rural and/or tribal areas in California.
* Demonstrate familiarity with supply chains and supply chain dynamics as relevant to gas end uses and lower-carbon alternatives.

As summarized in Section B (Key Words/Terms) above, for the purposes of this solicitation, applicants have latitude in how they define rural, preferentially referring to a federal system to support their characterization (e.g. from the U.S. Bureau of the Census,[[9]](#footnote-10) U.S. Department of Agriculture, or U.S. Department of Health and Human Services). For the purposes of this solicitation, a tribal area is land that falls under the ownership, jurisdiction, or control of a California Native American Tribe, or a California Native American Tribe or other California Tribal Organization. The tribal area must be within the State of California and be located on or connected to tribal land. Tribal lands, defined as lands that constitute “Indian country,” as defined by 18 U.S.C. § 1151, or that otherwise fall under the ownership or jurisdiction of a Federally-recognized California Native American Tribe, would be considered as a tribal area for the purposes of this solicitation. The selected rural or tribal areas must include residential and/or commercial fossil gas customers.

The Project Narrative (Attachment) must discuss the following in the sections identified:

Technical Merit:

* Describe the rationale for the communities selected for study, including with respect to representing a range of different conditions. Justify why the areas qualify as tribal and/or rural. For areas that are not considered tribal, explain what makes the area “rural” (e.g., using the Census Bureau or other formal systems, and/or by other criteria), and summarize the extent of gas use in the selected area.
* Provide a brief statement explaining the applicability of the proposed research in each community to California gas IOUs and benefits to their ratepayers. If the community is not located in the service area of a California gas IOU, then also provide an additional brief statement explaining the applicability of the proposed research to the community’s gas provider and the benefits to the community’s ratepayers, as appropriate.

Technical Approach:

* Describe analytical and conceptual approaches of data collection and interpretation, including with respect to sampling philosophy and representation of communities with respect to what matters for transitioning away from gas use. These factors might include economic circumstances, local culture or politics, experience with electricity reliability, distance from major urban centers, or other considerations; applicants are encouraged to use their own framing.

Team Qualifications, Capabilities, and Resources:

* Describe the social sciences and fieldwork expertise on the research team as relevant to the applicant requirements noted above.
* Describe any experience within the research team on energy use or social conditions in rural and/or tribal areas.
* Describe any experience within the research team on energy workforce or energy equipment supply chains.

**Group 2: Fieldwork and Analysis Across the Value Chain to Support Gas End Use Conversion (maximum award amount $800,000).**

Grants funded under this group will build a pragmatic understanding of decision processes and stakes throughout the supply chainfor gas end uses and electrification or other conversion of those gas end uses;[[10]](#footnote-11) provide actionable recommendations to enable conversion of fossil gas uses to electricity or low-carbon alternatives; and inform programs, planning, and technology development to support a transition that helps deliver energy affordability, energy resilience, energy safety, and other direct benefits to Californians. Funded research must focus on empirical research and go beyond generic assumptions, including, but not limited to, the assumption that electrification, in and of itself, is always the better choice for individuals.

Proposals **must** investigate, **at a minimum, three** of the following topics (which are summarized below), justify the topics chosen, and describe how the analysis will respond to the topic-specific requirements and goals outlined below:

1. ***Niche identification, with corresponding data compilation and analysis, to support development of systematic strategies for gas end use decarbonization pathways* *and approaches.*** This topic includes identification and characterization of an array of residential and/or commercial building niches, categories, or profiles with respect to electrification or other gas decarbonization potential, or frictions thereof, for converting from fossil gas. For the residential sector, for example, major niches could include categories such as low-income multifamily homes, mobile homes and mobile home parks, single-family households with solar panels, etc. These niches would likely be accompanied by defined subniches or other elaboration with respect to additional key characteristics that are likely to affect capacity to convert from fossil gas or impacts thereof (e.g., ownership, end uses, location). Niches could also be defined in terms of particular end uses or demographic characteristics, or other combinations of technical, locational, environmental, and other characteristics or situations that may substantially affect propensities to convert from fossil gas or the results of that conversion. The array(s) of niches should cover a large proportion of all residences and/or commercial premises now using gas and include consideration of some of the most difficult-to-convert situations.

In proposals, applicants are advised to outline an initial basic approach for defining and systematizing these niches along with the rationale and vision for the application. If awarded, the research phase should include estimated size of niches (e.g. number of households, gas use details) and consider subcategories relevant to approaches for decarbonizing gas uses within the niche (e.g., with respect to range of end uses, ownership, location, demographics). Research results should include information on types of strategies that overcome or otherwise manage frictions for converting away from fossil gas, including acknowledging where these strategies may not work well.

***Goal:*** *Create a conceptual framework and supporting data analysis that assists program developers, researchers, technology developers, and planners to move beyond “average customer” models to more efficiently differentiate solutions, understand leverage points and barriers pertinent to converting from gas, and track impacts thereof.*

1. ***Value/supply chain analysis impacting conversion from gas end uses*.** This topic covers examination of gas equipment replacement decisions across a variety of circumstances, covering both user and/or owner decision-making as well as other (e.g., contractor, retailer, manufacturer, local government) influential key party interests and practices. Research investigation should include identifying frictions impeding conversion from gas by end use, and a clear data collection component (e.g., interviews with contractors, observations) with attention to specific consumer characteristics (e.g., building conditions, lifestyle) as well as upstream elements (e.g., contractor decision process) that influence conversion from gas to electricity or lower-carbon alternatives.

The research should also provide insights or examples relevant to managing frictions; for example, analysis could include limited testing of, or evidence on, communications, process, or technology innovations that could better motivate conversions from gas end use to electricity or other lower-carbon alternatives or improve user experiences after conversion. Either residential or commercial building end uses can be considered. A proposal could address a single key end use category (e.g., residential space heating) or multiple end uses.

***Goal:*** *Produce an empirically based analysis of considerations and relationships across various parties in the value chain for gas-fired end use(s) to illuminate what shapes installation decisions for or against using gas, potential leverage points favoring conversion from gas, and existing frictions to conversion. This analysis will be done in a manner that informs the development of workforce programs, gas transition research, and policy to better favor conversion from gas where feasible.*

1. ***Experience and user impacts from recent electrification efforts****.* The topic covers recent experiences with the electrification of existing end uses—including cases where electrification was considered but rejected or compromised—in residential or commercial sectors. Funded research would include analysis of actual equipment replacement (or replacement attempts) in residential or commercial buildings. Based on analysis of these experiences and any supporting quantitative data (e.g., equipment sales), where has electrification been most appealing and unappealing, what impediments to electrification have been encountered (see, e.g., Aufhammer 2024), what solutions if any have been found to these barriers, how satisfactory have the results of electrification been for building occupants and/or owners, and what constructive advice do these results imply?

This topic could include analysis of experiences in jurisdictions that had issued bans or restrictions on gas connections over the past decade. It could also include identification and analysis of any compelling framing or approach that effectively influences users or building owners to convert away from gas in one or more end uses.[[11]](#footnote-12) Applicants should outline how experiences would be sampled and describe fieldwork, which would likely include a range of involved parties (e.g. users, owners, contractors, program mangers if any). “Lessons learned” and non-success stories (e.g., situations where a homeowner or facilities manager pursued electrification but decided against it) should also be considered, and data collection strategies should be designed to uncover experiences that are usually not written down.

***Goal:*** *Systematically uncover and bring to light important lessons from prior or ongoing electrification efforts and experiences, and articulate these lessons in a manner that situates future efforts for better outcomes and well-informed planning expectations.*

1. ***Commercial buildings analysis*.** This topic would examine gas use, conversion of fossil gas end uses to electricity or other lower-carbon alternatives (e.g., networked geothermal), and barriers to conversion for one or more commercial business types. For example, applicants could propose examining the details of restaurant owner perceptions of, and/or experience with, converting from utility gas to electricity, and analyze options for improving the appeal and success of conversion, differentiating across different types of restaurant and owner characteristics (e.g., franchise vs. small independent business) and building management structures.

***Goal:*** *Systematically outline decision processes and considerations for replacing gas end uses in commercial buildings in a manner that helps program developers, policymakers, and researchers understand the nature and structure of business decision-making for the selected applications, and to develop technological, communication, or other improvements that could make electrification more appealing and/or more beneficial to businesses.*

1. ***Gas usage analysis*.** This topic would provide analysis of gas usage and/or how patterns of gas use are changing over time. It should include gas usage data at a more refined scale than monthly billing data—such as at hourly or at least daily intervals—to better illuminate gas usage patterns (e.g., with respect to end uses, demographics, weather, and geography) and to interpret the implications of these usage patterns for conversion decisions and for gas systems operations. Usage analysis could include interpretation of usage with respect to gas system safety, hydraulics, and pipeline decommissioning. Applicants pursuing this topic should provide details on what gas use data they have at their disposal or are reasonably certain they can obtain in a timeframe congruent with the proposed research.

***Goal:*** *Produce and organize examples of detailed gas usage data analyses illustrating a range of possibilities for expanded research and analyses that more fully inform facets of gas decommissioning and energy transition planning.*

1. ***Workforce conditions and needs assessment*.** This topic would provide analysis of realistic changes in California workforce and equipment/materials supply chains needed to support electrification or other conversion of fossil gas end uses in residential and commercial sectors, including finding potential compelling benefits for currently gas-centered labor and supply ecosystems to promote or serve electrification or other conversion versus continued reliance on fossil gas. This analysis should be empirically based, including outlining the details of current workforce and related skills with respect to various end uses and applications; providing assessment of supply chain barriers and workforce/skill barriers; and discussing how these barriers could be overcome, including by individuals currently supporting gas equipment production, installation, and repair. Research should be done with attention to variability across geographic, demographic, cultural (e.g., fossil fuel-centrism in some areas vs. others), and economic factors. This should include attention to assisting the workforce now specializing in gas to gain skills needed to transition to clean energy jobs.Applicants should also discuss gas system decommissioning needs. Applicants should identify which end use(s) their analysis would center on.

***Goal:*** *Produce a research-based identification of key end use workforce development needs and realistic pathways to fulfilling these needs, thus improving the availability of a workforce poised to skillfully support the transition away from fossil gas.*

1. ***Compelling opportunities for end use conversion away from reliance on fossil gas*.** Examination of other promising opportunities for transitioning away from gas, such as areas served by small gas distribution companies[[12]](#footnote-13) or areas identified as high priority by state agencies. Research should include how these opportunities could be capitalized on in ways that simultaneously support gas decommissioning while leaving affected communities better off.

***Goal:*** *Illustrate potential for transitioning away from gas for particular situations where conversion from gas is already made most compelling or most necessary “as is.”*

1. ***Other topic(s) of applicant choice addressing location-specific aspects of gas decommissioning*.** Applicants may propose another (distinct from what is listed above) topic, **if** at least two of the topics above are addressed and adequate justification is provided.

***Goal:*** *This is an opportunity for applicants to complement the aforementioned topical areas by providing research supporting the purpose of the solicitation and the focus of Group 2 that is not otherwise itemized.*

Successful applicants to Group 2 **must demonstrate**:

* Social sciences expertise, ideally including expertise from sociology, anthropology, social studies of technology, or similar disciplines.
* Fieldwork expertise, including capabilities to plan, conduct, and analyze in-depth interviews. If surveys or other methods (e.g., workshops, focus groups) are to be used, appropriate expertise must also be demonstrated.
* Ability to understand and analyze gas technology markets and related service markets.
* Adequate understanding of relevant data sources and their limitations, depending on topics considered.
* Understanding of gas energy transitions policy, theory, and topical concerns from policy and academic perspectives.

Projects in this group must, **at a minimum**:

* Study locations in California using fossil gas.
* Prioritize fieldwork and/or use of empirical data.

The Project Narrative (Attachment) must discuss the following in the sections identified:

Technical Merit:

* Justify the technical merit of the topics selected, including the ways in which the research proposed is complementary for the selected topics.

Technical Approach:

* Describe the basic methods as well as analytical and conceptual approaches and logics of data collection and interpretation you will use on the project, including with respect to representation within selected communities or case studies concerning factors at play in transitioning away from gas use.
* Provide an overview of initial sampling plans and/or data access plans corresponding to the specific topics addressed and a brief assessment of relevant project risks and how they could be managed. Sampling plans are not expected to be formal statistical sampling plans (unless this can reasonably be done). However, they should outline a sample selection methodology and logic that ensure the sample representation or breadth will likely to be of substantial value to the gas decommissioning and electrification/conversion planning communities. Where existing data is key to the analysis (for example, in proposing analysis of gas usage data), applicants should indicate whether they currently have access to the data and whether they have the right to use it in the proposed project; if access and/or use rights are not current, outline a promising approach to obtain these rights.
* Provide a brief statement explaining the applicability of the proposed research in each community to California gas IOUs and benefits to their ratepayers. If the community is not located in the service area of a California gas IOU, then also provide an additional brief statement explaining the applicability of the proposed research to the community’s gas provider and the benefits to the community’s ratepayers, as appropriate.
* If modeling is to be used for a portion of the research, defend the applicability of the modeling to actual situations.
* Articulate how the proposed research is poised to fulfill the goal(s) identified for each topic.

Team Qualifications, Capabilities, and Resources:

* Describe social scientific and fieldwork expertise on the research team as applicable to the proposed work.

## Funding

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

There is **up to $2,200,000** 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: Gas System Decarbonization and Decommissioning in Rural and/or Tribal Areas | $600,000 | $500,000 | $600,000 | 5% |
| Group 2: Fieldwork and Analysis Across the Value Chain to Support Gas End Use Conversion (2 grants) | $1,600,000 | $600,000 | $800,000 | 5% |

1. **Match Funding Requirement**

Match funding is required in the amount of at least 5% 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 California Energy Commission (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 (CAM) 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[[13]](#footnote-14) |
| --- | --- | --- |
| Solicitation Release | March 19, 2025 |  |
| **Pre-Application Workshop** | **March 27, 2025** | **10:00 a.m.** |
| **Deadline for Written Questions[[14]](#footnote-15)** | **April 10, 2025** | **5:00 p.m.** |
| Anticipated Distribution of Questions and Answers | Week of April 21 |  |
| **Deadline to Submit Applications** | **May 30, 2025** | **11:59 p.m.** |
| Anticipated Notice of Proposed Award Posting Date | July 30, 2025 |  |
| Anticipated Energy Commission Business Meeting Date | October 8, 2025 |  |
| Anticipated Agreement Start Date | October 29, 2025 |  |
| Anticipated Agreement End Date | March 31, 2029 |  |

## Notice of Pre-Application Workshop

CEC staff will hold one Pre-Application Workshop to discuss this 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 refer to the CEC's website at www.energy.ca.gov/contracts/index.html to confirm the date and time. Please be aware that the meeting will be recorded.

**Date and time:** March 27, 2025, at 10:00 a.m. Pacific Time

**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:** 819 0968 0435

**Meeting Password:** 513639

**Topic:** GFO-24-501: Paving the Way for California’s Gas Transition Pre-Application Workshop

**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 Pre-Application Workshop:**

* 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 (916) 957-7910.

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

<https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0060748>

* If you have a disability and require assistance to participate, please Erica Rodriguez by e-mail at Erica.Rodriguez@energy.ca.gov or (916) 764-5705 at least five days in advance.

## Questions

During the solicitation process, for questions only related to submission of application in the new ECAMS system, please contact ECAMS.SalesforceSupport@energy.ca.gov. Through that email address applicants will be able to access a team of technical assistants who can answer questions about application submission. Please also see Section III.B for additional information about the ECAMS system.

For all other questions, including all technical and administrative questions that are not related to submission of applications in the ECAMS system, please contact the Commission Agreement Officer listed below:

Marissa Sutton, Commission Agreement Officer

California Energy Commission

715 P, MS-1

Sacramento, California, 95814

Telephone: (916) 237-2515

E-mail: Marissa.Sutton@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., administrative questions concerning application format requirements or attachment instructions) may be submitted to the CAO at any time prior to 5:00 p.m. of the application deadline date. Similarly, questions related to submission of applications in the ECAMS system may be submitted to ECAMS.SalesforceSupport@energy.ca.gov 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 entire 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 and Scoring Criteria and Grounds to Reject an Application or Cancel an Award in Part IV, and the relevant EPIC Grant terms and conditions located at: https://www.energy.ca.gov/funding-opportunities/funding-resources.

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 and property of the State after the CEC posts the Notice of Proposed Award or the solicitation is cancelled. Only submit information you want made public. Marking any portion of your application as confidential may result in disqualification.

## Background

1. **Gas R&D Program[[15]](#footnote-16)**

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 California Energy Commission as administrator of the program in August 2004[[16]](#footnote-17). 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.”[[17]](#footnote-18)

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 Plans. This solicitation targets the following research initiative(s) from the Gas R&D Budget Plan for Fiscal Years 2021/2022[[18]](#footnote-19) and 2022/2023[[19]](#footnote-20):

**Gas R&D Budget Plan for Fiscal Year 2021/2022**

* **Research Area**: Energy-Related Environmental Research
  + **Research Initiative**: Location-Specific Analysis of Decommissioning to Support Long-Term Gas Planning

**Gas R&D Budget Plan for Fiscal Year 2022/2023**

* **Research Theme**: Targeted Gas System Decommissioning
  + **Research Initiative**: Scaled-Up Gas Decommissioning Pilots and Integrated Planning Tools
* **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[[20]](#footnote-21) - 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 greenhouse gas (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[[21]](#footnote-22) - California Global Warming Solutions Act of 2006: emissions limit**

In 2016, SB 32 expanded 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.

* **SB 350[[22]](#footnote-23) Clean Energy and Pollution Reduction Act of 2015,**

SB 350 does the following: 1) expands California’s Renewable Portfolio Standard goals and requires retail sellers of electricity and local publicly owned electricity to increase their procurement of eligible renewable energy resources; 2) requires the CECn to establish annual targets for statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; and 3) provides for transformation of the Independent System Operator into a regional organization.

Additional information: http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb\_0301-0350/sb\_350\_bill\_20151007\_chaptered.htm

* **California Energy Code**

The Energy Code is a component of the California Building Standards Code and is published every three years through the collaborative efforts of state agencies including the California Building Standards Commission and the CEC. The Code ensures that new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality through use of the most energy efficient technologies and construction.

Additional information: http://www.energy.ca.gov/title24/

Applicable Law: California Code of Regulations, Title 24, Part 6 and associated administrative regulations in Part 1

* **SB 100[[23]](#footnote-24) - The 100 Percent Clean Energy Act of 2018**

SB 100 requires that 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. The bill requires the CPUC and CEC, in consultation with CARB, to ensure that California’s transition to a zero-carbon electric system does not cause or contribute to GHG emission increases elsewhere in the western grid.

Additional information:

https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\_id=201720180SB100

* **AB 3232[[24]](#footnote-25) - Zero-Emissions Buildings and Sources of Heat Energy**

AB 3232 required CEC to assess by January 1, 2021, and in consultation with CPUC, CARB, and the California Independent System Operator (CAISO), the potential for California to reduce GHG emissions from the state’s residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. It also required CEC to include in the 2021 edition of the IEPR, and subsequent IEPRs, a report on the emissions of GHG associated with the supply of energy to residential and commercial buildings.

Additional information: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\_id=201720180AB3232 <https://www.energy.ca.gov/data-reports/reports/building-decarbonization-assessment>

https://efiling.energy.ca.gov/GetDocument.aspx?tn=239368&DocumentContentId=72826

* **AB 2672[[25]](#footnote-26) - Access to energy: disadvantaged communities: San Joaquin Valley**

AB 2672 required the CPUC to initiate a new proceeding (R.15-03-010) to identify disadvantaged communities in the San Joaquin Valley and to analyze economically feasible options to increase access to affordable energy in those disadvantaged communities. AB 2672 also required CPUC to determine whether the options analyzed by the proceeding would increase access to affordable energy to those disadvantaged communities in a cost-effective manner. The bill further required CPUC, for those options, to take appropriate action and determine appropriate funding sources.

Additional information: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\_id=201320140AB2672

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

Governor Brown’s Executive Order B-55-18 established a new statewide goal to achieve carbon neutrality no later than 2045. In addition, all policies and programs undertaken to achieve carbon neutrality must seek to improve air quality and support the health and economic resiliency of urban and rural communities, particularly low-income and disadvantaged communities, and must be implemented in a manner that supports climate adaptation and biodiversity.

Additional Information:

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

* **SB 1221[[26]](#footnote-27) - Gas corporations: ceasing service: priority neighborhood decarbonization zones**

SB 1221 requires each California gas IOU to submit to CPUC a map including the location of all potential gas distribution line replacement projects identified in its distribution integrity management plan and other foreseeable gas distribution pipeline replacements. This information is to be submitted on or before July 1, 2025, and annually thereafter. The bill requires CPUC to designate, on or before January 1, 2026, priority neighborhood decarbonization zones considering, among other things, the concentration of gas distribution line replacement projects identified in the maps and to establish a voluntary program to facilitate the cost-effective decarbonization of priority neighborhood decarbonization zones. This bill also requires CPUC to establish various processes, criteria, methodology, and requirements in administering the pilot projects, including by establishing the criteria and methodology for determining the cost-effectiveness of zero-emission alternatives.

Additional Information:

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\_id=202320240SB1221

* **AB 1279[[27]](#footnote-28) - The California Climate Crisis Act**

AB 1279 declares the policy of the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter and ensure that statewide GHG emissions are reduced to at least 85 percent below 1990 levels.

Policies/Plans

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

California Public Resources Code Section 25302 requires the CEC 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 CEC 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.

* **New Residential Zero Net Energy Action Plan 2015-2020**

The Residential New Construction Zero Net Energy Action Plan supports the California Energy Efficiency Strategic Plan’s goal to have 100 percent of new homes achieve zero net energy beginning in 2020. The action plan provides a foundation for the development of a robust and self-sustaining zero net energy market for new homes.

Additional information: http://www.californiaznehomes.com/

* **CPUC** **R.20-01-007, Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and perform Long-Term Gas System Planning**

To ensure safe and reliable gas service at just and reasonable rates in California, CPUC opened this rulemaking to (1) develop and adopt updated reliability standards that reflect the current and prospective operational challenges to gas system operators; (2) determine the regulatory changes necessary to improve the coordination between gas utilities and gas-fired electric generators; and (3) implement a long-term planning strategy to manage the state’s transition away from fossil gas-fueled technologies to meet California’s decarbonization goals.

Additional information https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M325/K641/325641802.PDF (effective January 16, 2020):

* **CPUC D.20-07-032, Decision Adopting Metrics and Methodologies for Assessing the Relative Affordability of Utility Service** (as part of CPUC OIR.18-07-006 Order Instituting Rulemaking to Establish a Framework and Processes for Assessing the Affordability of Utility Service)

D.20-07-032, issued in July of 2020, directed CPUC staff to develop an Annual Affordability Report that would include an assessment of affordability of electricity, gas, water, and communications services using the most recent data available. The Decision defined affordability as the degree to which a representative household is able to pay for an essential utility service charge, given its socioeconomic status.

Additional information:

https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K049/344049206.PDF

https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/reports/2019-annual-affordability-report.pdf

* **CPUC R.24-09-012, Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning**

CPUC opened this rulemaking to continue the work of R.20-01-007, described above, noting that significant time had elapsed since the prior rulemaking was opened and that several additional issues merit consideration toward resolving key unresolved issues in R.20-01-007.

Additional information https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M542/K029/542029029.PDF (issued October 4, 2024):

Reference Documents

Refer to the documents below for information about activities associated with California’s gas transition, including full references for documents cited in the Purpose and Project Focus sections.

* Aufhammer, Maximillian. 2024. “Why is Getting a Heat Pump so Hard?,” *Energy Institute Blog.* July. <https://energyathaas.wordpress.com/2024/07/01/why-is-getting-a-heat-pump-so-hard/comment-page-3/>
* Bergquist, Ann-Kristin and Magnus Lindmark, 2023, “Economic History and the Political Economy of Energy Transitions: A Research Overview.” *Uppsala Papers in Economic History* 2, <https://journals.uu.se/upeh/article/view/576>
* Blazquez, Jorge, Rolando Fuentes, and Baltasar Manzano. 2020. “On Some Economic Principles of the Energy Transition.” *Energy Policy* 147:111807. <https://doi.org/10.1016/j.enpol.2020.111807>
* Blumstein, Carl, Betsy Krieg, Lee Schipper, and Carl York, 1979. “Overcoming Social and Institutional Barriers to Energy Conservation,” Lawrence Berkeley National Laboratory, <https://escholarship.org/uc/item/39q572t5>
* Bonner, Olivia and Amande Zerbe. 2023. “What Should We Do When the Natural Gas Company Leaves Town?” SLS Blogs. [https://law.stanfo](https://law.stanford.edu/2023/05/21/what-should-we-do-when-the-natural-gas-company-leaves-town/)rd.edu/2023/05/21/what-should-we-do-when-the-natural-gas-company-leaves-town/Brockway, Anna. 2021. *Gas Planning and Reliability in California*. Graduate Intern White Paper. California Public Utilities Commission. <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/natural-gas/long-term-gas-planning-oir/gasplanning_final_2021-12-27.pdf>
* CEC (Melissa Jones et al), 2022. *Final 2021 Integrated Energy Policy Report, Volume III: Decarbonizing the State’s Gas System.* California Energy Commission. Publication Number: CEC-100-2021-001-V3. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=242233>
* Gold-Parker et al., 2024, *An Analytical Framework for Targeted Electrification and Strategic Gas Decommissioning: Identifying Potential Pilot Sites in Northern California’s East Bay Region*. California Energy Commission. Publication Number: CEC-500-2024-073. <https://www.energy.ca.gov/sites/default/files/2024-06/CEC-500-2024-073.pdf>
* Jasanoff, Sheila, 2018, “Just Transitions: A Humble Approach to Global Energy Futures.” *Energy Research & Social Science* 35: 11–14, <https://doi.org/10.1016/j.erss.2017.11.025>
* Joint Agency Staff, 2024. *Joint Agency Staff Paper: Progress Towards a Gas Transition. A White Paper Supporting the CPUC’s Long-Term Gas Planning Rulemaking.* Updated 22 February 2024 <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M525/K660/525660391.PDF>
* Nordgren, Loran and David Schonthal, 2022, *The Human Element: Overcoming the Resistance that Awaits New Ideas*, Wiley.
* The RAND Corporation. Strategic Pathways and Analytics for Tactical Decommissioning of Portions of Natural Gas Infrastructure in Southern California, California Energy Commission grant number PIR-20-008. Publication forthcoming. <https://www.energizeinnovation.fund/projects/strategic-pathways-and-analytics-tactical-decommissioning-portions-natural-gas-0>
* Stafford, Edwin R., and Victoria N. Stafford. 2023. “Now We’re Cooking with Electromagnetism: Making Induction Stoves Cool.” *Sustainability and Climate Change* 16 (3): 182–93. <https://doi.org/10.1089/scc.2023.0044>
* Watson, Matt and Elizabeth Shove, 2023, “How Infrastructures and Practices Shape Each Other: Aggregation, Integration and the Introduction of Gas Central Heating,” *Sociological Research Online* 28 (2): 373–88. <https://doi.org/10.1177/13607804211055495>

## Match Funding

* **“Match funds”** includes cash or in-kind (non-cash) contributions provided by the applicant, subrecipients, 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** can be in the form of goods or services that are not reimbursed with CEC funds such as labor (if reasonable and justified), donated space, existing equipment, existing supplies, services provided by a third-party or subrecipient, and other expendable property in support of the project. The value of in-kind match is based on the fair market value of the goods and services provided at the time it is claimed as match. The value of existing equipment must be prorated for its use in the project and depreciated or amortized over the term of the project using generally accepted accounting principles (GAAP). Labor rates for hours donated by non-employees who are not paid for their time must be consistent with those paid for similar work. Cost allocations must be reasonable and allocable to the proposed project. In-kind match share must be included in the agreement budget.

The grant recipient is expected to maintain appropriate documentation to support the fair market value of all in-kind match including match donated by third parties or major subrecipients.

* Match funds must be spent only during the agreement term, either before or concurrently with CEC funds or in accordance with an approved Match Fund Spending Plan. Match funds also must be reported in invoices submitted to the CEC.
* All applications that include match funds must submit commitment letters, **including applicant, subrecipients**, sub-subrecipients, and vendors 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 Commitment and Support Letters Form Attachment. Commitment and support letters must be submitted with the application to be considered.
* Any match pledged in an application must be consistent. For example, in the ECAMS system and in the Budget Attachment applicants will be asked to enter the project’s total match funding. The amounts listed in those places should 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, the match amounts entered in the ECAMS system and in the Budget must match this amount). If the amounts listed in an application are inconsistent, 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. 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.
    - **“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 count 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 subrecipients, sub-subrecipients, and vendors.
* 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 Washington. 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 Washington. The recipient orders the temperature sensors directly from Washington.  The manufacturer has training centers in CA that instructs purchasers on how to use the sensors. The invoice shows that the transaction occurred in Washington. 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 California Energy Commission’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.

# 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.

## Terms and Conditions

Each grant agreement resulting from this solicitation will include terms and conditions that set forth the grant recipient’s rights and responsibilities. By submitting an application in the ECAMS system, 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; (3) Special Terms and Conditions for California Native American Tribes and Tribal Organizations with Sovereign Immunity in addition to the standard terms and conditions; or (4) standard terms and conditions. All terms and conditions are located at https://www.energy.ca.gov/funding-opportunities/funding-resources. Please refer to the applicable Gas Grant terms and conditions. Failure to agree to the terms and conditions by taking actions such as failing to provide the required authorizations and certifications or indicating that acceptance is based on modification of the terms may result in rejection of the application. Applicants must read the terms and conditions carefully. The CEC reserves the right to modify the terms and conditions prior to executing grant agreements.

If a California Native American Tribe (Tribe) or California Tribal Organization with sovereign immunity is listed as a proposed awardee in the Notice of Proposed Award, CEC staff must receive the following before bringing the proposed award to a CEC Business Meeting:

1. A resolution or other authorizing document by the governing body of the Tribe or California Tribal Organization authorizing the Tribe or California Tribal Organization to enter into the proposed agreement, including accepting the Special Terms and Conditions for California Native American Tribes and Tribal Organizations with Sovereign Immunity.

2. A limited waiver of sovereign immunity in the form and manner required by tribal law; and

3. A resolution or other authorizing document delegating authority to execute the agreement to an appropriate individual.

The above requirements may be provided in one or more documents. The document(s) will be included as an exhibit to the resulting grant agreement.

Delay in award. Any delay in the Tribe or Tribal Organization’s ability to provide such documentation may result in delayed award of the grant agreement.

Reservation of right to cancel proposed award. Funds available under this solicitation have encumbrance deadlines which the CEC must meet in order to avoid expiration of the funds. In addition to any other rights reserved to it under this solicitation or that it otherwise has, the CEC reserves the right to cancel a proposed award if it determines, in its sole and absolute discretion, that the documentation described above would likely not be provided prior to an encumbrance deadline, and that the CEC’s ability to meet its encumbrance deadline may thereby be jeopardized. In this instance, the CEC may cancel the proposed award and award funds to the next highest scoring applicant.

## 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.

## Russia Sanctions

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. Recent legal restrictions may include Russian Sanctions as described below:

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. “Economic Sanctions” refers to sanctions imposed by the U.S. government in response to Russia’s actions in Ukraine, as well as any sanctions imposed under state law. The EO directs state agencies to terminate contracts with, and to refrain from entering any new contracts with, individuals or entities that are determined to be a target of Economic Sanctions.

Accordingly, should the State determine Recipient is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this agreement. The State shall provide Recipient advance written notice of such termination, allowing Recipient at least 30 calendar days to provide a written response. Termination shall be at the sole discretion of the State.



# 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 Energy Commission Agreement Management System (ECAMS), available at: https://ecams.energy.ca.gov.

The CEC is providing a team of technical assistants to support applicants with this new process. Please email ECAMS.SalesforceSupport@energy.ca.gov for support.

ECAMS allows applicants to complete and submit their application to the CEC prior to the date and time specified in this solicitation. Files uploaded to the system 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, such as match funding commitment letters, may be scanned and submitted in PDF format. Completed Budget Forms, Attachment, must be in Excel format.

The deadline to submit applications through ECAMS system is 11:59 p.m. on the Deadline to Submit Applications date shown in the Key Activities Schedule. ECAMS 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.

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 ECAMS, upload times may be much longer than expected. For example, unexpected issues could occur, causing long delays that prevent timely submission. Please plan accordingly. For instructions on how to apply using the ECAMS system, please see the How to Apply document available on the CEC website at: https://www.energy.ca.gov/funding-opportunities/funding-resources, under General Funding Information, Energy Commission Agreement Management System (ECAMS).

First time users must register as a new user to access the system. There will be two types of user accounts to establish: 1) An organizational account, for the entity applying to the solicitation; and 2) user accounts for individuals who will be submitting the application on behalf of the organization.

Applicants will be required to upload all attachments marked “required” in the system in order for the application to be submitted.

## 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. Executive Summary Form (Attachment 1)

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 2)

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 3)

Identify by name all key personnel[[28]](#footnote-29) assigned to the project, including the project manager and principal investigator (if applicable), and individuals employed by any major subrecipients (a major subrecipient is a subrecipient receiving $100,000 or more of CEC funds). Clearly describe their individual areas of responsibility. Include the information required for each individual, including a resume (maximum two pages).

1. Scope of Work Template (Attachments 4)

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.

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

1. Project Schedule (Attachment 5)

The Project Schedule includes a list of all products, 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 6)

Because this solicitation is utilizing the new ECAMS system for submitting applications, applicants have two options for uploading a budget:

* **Option 1: Prime Applicant’s budget is both keyed directly into ECAMS and uploaded as an MS Excel attachment; the Prime Major Subrecipient(s) budgets are uploaded as MS Excel attachments.** The new ECAMS system allows applicants to build the prime applicant’s budget directly into the system. At this time, there is no way to input major subrecipient budgets directly into the system. Instructions for inputting budget items into the ECAMS system are included at: https://www.energy.ca.gov/funding-opportunities/funding-resources.
* **Option 2: Upload all budgets (Prime and Major Subrecipients) as MS Excel attachments** and leave the ECAMS budget sections blank.

Instructions for completing the budgets can be found in Budget Category Guidance at the ECAMS Resources page. **Read the instructions tab on the MS Excel attachments Attachment 6 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.

* All project expenditures (match share and reimbursable) must be made within the Anticipated Agreement Start and End dates listed in the “Key Activities Schedule” of this solicitation manual. Match share requirements are discussed in Part I.D and I.K of this solicitation. The entire term of the agreement and projected rate increases must be considered when preparing the budget.
* 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 agreement terms and conditions. Rates and personnel shown must reflect the rates and personnel the applicant would include if selected as a Recipient.
* The rates proposed, except for Direct Labor and Fringe Benefits, are considered capped and may not change during the agreement term. Except for Direct Labor and Fringe Benefits, the grant recipient will only be reimbursed for actual rates and not to exceed the capped rates. The rates proposed for Direct Labor and Fringe Benefits are treated as estimates; a grant recipient can invoice at higher rates as long as it is only invoicing for actual expenditures it has made. If an applicant, by law, cannot agree to Direct Labor and Fringe Benefits rates being treated as estimates, the applicant can request to modify this term. This modification may be negotiated if the applicant is proposed for award. The CEC retains the sole right to refuse to agree to any requested modifications. The budget must NOT include any grant recipient profit from the proposed project, either as a reimbursed item, match share, or as part of overhead or general and administrative expenses (subrecipient profit is allowable, though the maximum percentage allowed is 10% of the total subrecipient rates for labor, and other direct and indirect costs as indicated in the Category Budget tab). Please review the terms and conditions and budget forms for additional restrictions and requirements.
* 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 CAM.
* 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 with CEC funds, with the exception of costs incurred by University of California grant recipients.
* 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.
* **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, the 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, the grant recipient must either:

* 1. 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,

* 1. 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 7)

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 8)
   * 1. Section 1: Provide applicant and subrecipients 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 9)

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.

* **Project partners** that are making contributions other than match funding or a study 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 study 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 10)

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 11)

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 12)

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 on its website and will e-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. If an applicant, by law, cannot agree to certain terms and conditions, the applicant can request a modification. This modification may be negotiated if the applicant is proposed for award. The CEC retains the sole right to refuse to agree to any requested modifications.

## 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: https://www.energy.ca.gov/funding-opportunities/solicitations. 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 recall or modify a submitted application within ECAMS before the deadline to submit applications. 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.” **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.

1. **Opportunity to Cure Administrative Errors**

The CEC understands and appreciates the significant time and expense applicants spend preparing applications.  An administrative error that prevents an applicant from submitting a complete application frustrates both the CEC and applicants.  The purpose of this process is to reduce the number of applications screened out or receiving a significantly reduced score for administrative errors while maintaining a fair competition.  This process also ensures better competition and thus better projects to benefit California.

After the application deadline, an applicant might identify, or the Evaluation Committee may find what reasonably appears to be, an administrative error.  For purposes of this solicitation only, an administrative error is defined as an applicant’s inadvertent mistake that prevents materials in existence as of the application deadline from appearing in its submitted application.  Examples include, but are not limited to, accidentally:

* Scanning and submitting every other page in a document instead of every page.
* Submitting the wrong document.
* Leaving out a document.

If the Evaluation Committee find what reasonably appears to be an administrative error, they can communicate with the applicant to confirm.  If an applicant finds an administrative error in its application, it should immediately contact the Commission Agreement Officer listed in the “Contact Information/Questions” section of this solicitation.

If an administrative error has been identified and communicated to the Commission Agreement Officer, the CEC may, but is not required to, allow the applicant a period of time to provide the missing materials.  Reasons why the CEC might NOT allow an applicant to fix an administrative error include, but are not limited to:

* The funds have a deadline that does not allow time to fix the error.
* The application has been screened out or does not receive a passing score for reasons unrelated to the administrative error, making irrelevant any efforts to fix the error.
* The applicant brings the error to the CEC’s attention too late in the solicitation process (e.g., after awards have been approved at a Business Meeting).

If the Evaluation Committee allows an applicant the opportunity to fix an administrative error, the Commission Agreement Officer will communicate in writing to the applicant’s project manager listed the deadline by which the applicant must provide the missing materials.  Reasonable efforts will be made to confirm receipt of the notice, but actual notice cannot be guaranteed, and the obligation is on the applicant to ensure the proper contact(s) are listed and available to respond.  The Evaluation Committee will not consider any materials submitted after the deadline.

This process only allows applicants to submit materials in existence as of the application deadline.  This process does NOT allow applicants to submit material created or modified after the application deadline. The CEC has sole discretion to determine whether materials submitted are eligible for consideration by the Evaluation Committee under this opportunity to cure.

Applicants must include the following certification along with the materials it submits to fix an administrative error and must explain why the materials were not provided due to an inadvertent administrative error:

“I certify on behalf of the applicant that the materials provided herein existed at the time of the application deadline, have not been modified since, and were not originally provided due to an inadvertent administrative error as described herein.”

The Evaluation Committee is not responsible for finding, or communicating with the applicant about, any errors in an application.  Applicants remain solely responsible for submitting applications, including any material submitted to fix an administrative error, that meet all solicitation requirements.

## 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 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 meet or exceed the minimum of 5% in match share of the total requested CEC funds. | 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, 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** |

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| --- |
| **Scoring CRITERIA**  **The Project Narrative (Attachment)** must respond to each criterion below. The responses must directly relate to the solicitation requirements and focus as stated in the solicitation. Any estimates of energy savings or GHG impacts should be calculated as specified in the References for Calculating Energy End-Use and GHG Emissions (Attachment), to the extent that the references apply to the proposed project. |

| **Scoring Criteria** | **Maximum Points** |
| --- | --- |
| 1. **Technical Merit** 2. Provides a clear and concise description of the technological advancement, scientific knowledge advancement, and/or innovation that will overcome barriers to achieving the State’s statutory energy goals. 3. Describes how the proposed study will be used by key stakeholders (e.g., policymakers, project developers, other researchers). 4. Describes the advantage of the proposed model/tool/study over that currently being used by key stakeholders. 5. Provides information described in Section I.C. | **15** |
| 1. **Technical Approach** 2. 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. Identifies and discusses factors critical for success, in addition to risks, barriers, and limitations (e.g., loss of demonstration site or key subrecipients). Provides a plan to address them. 5. 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. 6. Describes the knowledge transfer plan, including how key stakeholders and potential users will be engaged, and the plan to disseminate knowledge of the project’s results to those stakeholders and users. 7. Provides information documenting progress towards achieving compliance with CEQA by addressing the areas in Section I.I, Section III.D.3., and Section III.D.8. 8. Provides information described in Section I.C. | **25** |
| 1. **Impacts and Benefits for California IOU Ratepayers** 2. Explains how the proposed project will benefit California Gas IOU ratepayers and provides clear, plausible, and justifiable (quantitative preferred) potential benefits such as analytically-grounded research to support reduced reliance on fossil gas and an inclusive energy transition that delivers locally meaningful co-benefits while addressing cost, safety, resiliency, and reliability issues. States the timeframe, including assumptions with sources, and explains its reasonableness. 3. Identifies how outputs of the study 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 subrecipient 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, emphasizing multidisciplinary projects in the energy sector if relevant and including any notable influences on programs or policies. | **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. Includes complete budget forms for the applicant and all subrecipients, 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, subrecipients). 5. Justifies the reasonableness of indirect costs (e.g., overhead, facility charges (e.g., rent, utilities), burdens, subrecipient profit, other like costs). 6. Justifies how the proposed project, including the amount of match funds, optimizes the use of CEC funds to achieve program objectives. 7. Justifies the appropriateness of match funds with respect to the project’s potential risks and benefits, including level of commitment, type of match (e.g., cash, in-kind), sources, and match funding replacement strategy. | **10** |
| 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% | | **10** |
| 1. **Ratio of Direct Labor to Indirect Costs**   The score for this criterion will be calculated by the following formula:  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** |

1. See <https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:R2001007>) and, opened in September to continue the work of Rulemaking 20-01-007, Rulemaking R.24-09-012 (<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M542/K029/542029029.PDF>). [↑](#footnote-ref-2)
2. CEC (Melissa Jones et al.), 2022. *Final 2021 Integrated Energy Policy Report, Volume III: Decarbonizing the State’s Gas System*. California Energy Commission. Publication Number: CEC-100-2021-001-V3. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=242233> [↑](#footnote-ref-3)
3. Joint Agency Staff, 2024. *Joint Agency Staff Paper: Progress Towards a Gas Transition. A White Paper Supporting the CPUC’s Long-Term Gas Planning Rulemaking*. Updated 22 February 2024. <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M525/K660/525660391.PDF>. [↑](#footnote-ref-4)
4. To illustrate the type of thinking that these research papers inspire, two examples follow: (1) Local contractors used to installing gas equipment may habitually recommend replacing gas with gas for a variety of reasons related to skills, risk, materials, profits, beliefs, and long-standing relationships across existing supply chains self-interested in remaining relevant; (2) Rural homeowners, many of whom may have experienced important prolonged power outages, may have developed routines and invested in equipment that adequately serve their critical energy loads during electricity outages, and thus are reluctant to reconfigure and reinvest. Interventions focused on promoting generic benefits and improving simple economic logics of equipment replacement decisions cannot adequately address these types of situations on their own. [↑](#footnote-ref-5)
5. Gas use in industrial, agricultural, transportation, and power generation sectors are not targeted in this solicitation. Where applicable, however, applicants should invoke the relevance of these sectors in addressing locational and other relevant issues to a transition from gas in residential and commercial sectors. [↑](#footnote-ref-6)
6. For background on the need for examining barriers in more detail, see Blumstein et al. (1979). For a market perspective, and a discussion of frictions and value chains, see Nordgren and Schonthal (2022). [↑](#footnote-ref-7)
7. See, e.g., Shove and Walker (2014) for an introduction to social practices and energy demand. [↑](#footnote-ref-8)
8. See *Disadvantaged Communities Advisory Group (DACAG)* Comment on Draft Gas R&D Program FY 2023-2024 Budget Plan, TN 248873, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=248873&DocumentContentId=83413>) and *DNV Comments – Location-Specific Gas System Decommissioning Workshop* (TN 255660, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=255660&DocumentContentId=91485>). [↑](#footnote-ref-9)
9. The Census Bureau description of rural is provided at this link: <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>; see also <https://www.census.gov/content/dam/Census/library/publications/2019/acs/ACS_rural_handbook_2019_ch01.pdf>. According to the Public Policy Institute of California, less than 6% of the state’s population is considered rural according to the Census Bureau. and many in these areas do not have utility gas service. [↑](#footnote-ref-10)
10. Consideration of conversion to other lower-carbon alternatives to natural gas use are permitted, though the overall focus of this project on is on electrification. [↑](#footnote-ref-11)
11. For example, Stafford and Stafford (2023) argue that with attention, cooking on induction stoves can be more widely rendered as better than cooking with gas. [↑](#footnote-ref-12)
12. See, for example, Bonner and Zerbe (2023). [↑](#footnote-ref-13)
13. Pacific Standard Time or Pacific Daylight Time, whichever is being observed. [↑](#footnote-ref-14)
14. This deadline does not apply to non-technical questions (e.g., administrative questions concerning application format requirements or attachment instructions) including questions regarding application submission in the ECAMS system or to questions that address an ambiguity, conflict, discrepancy, omission, or other error in the solicitation. Such questions may be submitted to the CAO listed in Section G at any time prior to 5:00 p.m. of the application deadline. Please see Section G for additional information. [↑](#footnote-ref-15)
15. 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-16)
16. See CPUC Decision 04-08-010, August 19, 2004, http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/39314.PDF [↑](#footnote-ref-17)
17. *Id.* at pp. 25 and 46. [↑](#footnote-ref-18)
18. 2021. *Natural Gas Research and Development Program: Proposed Budget Plan for Fiscal Year 2021-22*. California Energy Commission. Publication Number: CEC-500-2021-022 [↑](#footnote-ref-19)
19. 2022. *Gas Research and Development Program: Proposed Budget Plan for Fiscal Year 2022–23*. California Energy Commission. Publication Number: CEC-500-2022-001 [↑](#footnote-ref-20)
20. AB 32 (Statutes of 2006, Chapter 488) [↑](#footnote-ref-21)
21. SB 32 (Statues of 2016, Chapter 246) [↑](#footnote-ref-22)
22. SB 350 (Statutes of 2015, Chapter 547) [↑](#footnote-ref-23)
23. SB 100 (Statutes of 2017, Chapter 312) [↑](#footnote-ref-24)
24. AB 3232 (Statutes of 2017, Chapter 373) [↑](#footnote-ref-25)
25. AB 2672 (Statutes of 2014, Chapter 616) [↑](#footnote-ref-26)
26. SB 1221 (Statutes of 2024, Chapter 602) [↑](#footnote-ref-27)
27. SB 1279 (Statutes of 2022, Chapter 337) [↑](#footnote-ref-28)
28. “Key personnel” are individuals that are critical to the project due to their experience, knowledge, and/or capabilities. [↑](#footnote-ref-29)