**GRANT FUNDING OPPORTUNITY**

**Decarbonizing Heating, Ventilation, and Air Conditioning Systems in Large Buildings**

**EPIC Program**



**Addendum 1**

**GFO-22-308 [**~~GFO-23-308~~**]**

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

**State of California**

**California Energy Commission**

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| Attachments

| Attachment Number | Title of Section |
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| 2 | Executive Summary  |
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# I. Introduction

## Purpose of Solicitation

The purpose of this solicitation is to fund applied research and development projects that develop decarbonization solutions for heating, ventilation, and air conditioning (HVAC) systems in large commercial buildings with an emphasis on technology advancements, energy efficiency, replicability, and use of ultra-low global warming potential (GWP) refrigerants.

Space heating needs in large buildings have historically been met using fossil fuels and combustion-based equipment to generate hydronic hot water. This equipment is generally inexpensive (boilers cost ~$12–$30 per thousand Btu per hour (MBH)), has high turndown or ability to operate efficiently when heating needs are low, and uses an available, reliable resource for fuel.[[1]](#footnote-2) However, combustion of fossil fuels emits criteria air pollutants and greenhouse gas emissions. Fossil gas combustion in commercial buildings is primarily used for space heating, water heating, and cooking, producing nearly 12 million metric tons of carbon dioxide equivalent in 2018.[[2]](#footnote-3)

As California transitions to electrifying space heating sys­tems, heat pumps and heat recovery chillers offer a viable option for traditional airside HVAC applications. However, heat pumps for large commercial buildings have challenges, such as higher first costs compared to fossil gas systems, lower operating efficiency at higher supply temperatures, and limitations operating at low ambient temperatures.[[3]](#footnote-4)

To address these challenges will require involvement by the HVAC industry and key stakeholders to increase opportunities for widespread and immediate market acceptance. Economically integrating energy efficiency solutions with advancements in manufacturing processes can reduce production costs of high efficiency heat pumps and other low carbon HVAC equipment. Technologies and projects funded by this solicitation could increase cost-effectiveness, energy efficiency, and use of ultra-low GWP refrigerants. The purpose of this solicitation is to develop and demonstrate affordable, promising, pre-commercial technologies to accelerate decarbonization of large building HVAC systems that use low or ultra-low GWP HVAC refrigerants. Projects must fall within one of the following project groups:

* **Group 1: Large Hybrid or Stand-Alone Low GWP Electric Heat Pump Systems**

Develop and test large hybridized or stand-alone heating and cooling systems (over 100 tons) that use a heat recovery chiller or heat pump (GWP of 10 or less) to operate during lower load conditions, with boilers and chillers being used during high load situations. May also develop a hybrid heating system using a heat pump or heat recovery chiller with thermal storage.

* **Group 2: Ultra-Low-GWP HVAC Heat Pump Advancements**

Develop and demonstrate advanced, cost-competitive, high-efficiency large air-source and water-source heat pumps that use ultra-low GWP (less than or equal to 4) refrigerants.

* **Group 3: Other Advanced HVAC Technologies**

Develop and demonstrate other types of low or zero carbon, non-vapor compression HVAC technologies for large commercial buildings with GWP of 0.

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

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

## Key Words/Terms

| **Word/Term** | **Definition** |
| --- | --- |
| Applicant | The entity that submits an application to this solicitation. |
| Application | An applicant’s written response to this solicitation. |
| Authorized Representative | *Authorized Representative*, the person signing the application form who has authority to enter into an agreement with the CEC.  |
| CAM | *Commission Agreement Manager,* the person designated by the CEC to oversee the performance of an agreement resulting from this solicitation and to serve as the main point of contact for the Recipient. |
| 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. |
| California Native American Tribe/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. |
| CAO | Commission Agreement Officer. |
| CBO | Community Based Organization. A public or private nonprofit organization of demonstrated effectiveness that: 1. Has an office in the region (e.g., air basin or county) and meets the demographic profile of the communities they serve.
2. Has deployed projects and/or outreach efforts within the region (e.g., air basin or county) of the proposed disadvantaged or low-income community.
3. Has an official mission and vision statements that expressly identifies serving disadvantaged and/or low-income communities.
4. Currently employs staff member(s) who specialized in and are dedicated to – diversity, or equity, or inclusion, or is a 501(c)(3) non-profit.
 |
| CEC | State Energy Resources Conservation and Development Commission or the California Energy Commission. |
| CEQA | California Environmental Quality Act, California Public Resources Code Section 21000 et seq. |
| **Commercial Buildings** | **Commercial buildings are those covered by the state’s Title 24 building energy efficiency standards and include a wide variety of nonresidential building types such as high-rise multifamily, offices, retail, restaurants, campuses and hospitals.[[4]](#footnote-5) Facilities engaged in the manufacturing and processing of food, beverage, and industrial products and materials are not commercial buildings.**  |
| COP | Coefficient of Performance is the ratio of useful heating or cooling provided to work required. |
| Days | Days refer to calendar days. |
| Decarbonization | Decarbonization means to reduce greenhouse gas emissions from the building's energy use through energy efficiency and use of non-fossil energy sources. |
| Disadvantaged Community | These are communities that represent the 25% highest scoring census tracts in CalEnviroScreen 4.0, census tracts previously identified in the top 25% in CalEnviroScreen 3.0, census tracts with high amounts of pollution and low populations, and federally recognized tribal areas as identified by the Census in the 2021 American Indian Areas Related National Geodatabase. (https://oehha.ca.gov/calenviroscreen/sb535) |
| Electrification | Electrification means converting fossil fueled equipment to electricity-using equipment. |
| Energy Equity | The fair distribution of benefits and burdens from energy production and consumption. |
| EPIC | Electric Program Investment Charge, the source of funding for the projects awarded under this solicitation. |
| GHG | Greenhouse gas. |
| GWP | Global Warming Potential. |
| Heat Pump | A heat pump is a device that can provide heat to a building by transferring thermal energy from the outside using a refrigeration cycle. Many heat pumps can also operate in the opposite direction, cooling the building by removing heat from the enclosed space and rejecting it outside. |
| Heat Recovery Chiller | A heat recovery chiller is a traditional type chiller where the heat of condensing is absorbed by a water loop, which is then used for heating. |
| HHW | Heating hot water. |
| IOU | Investor-owned utility, an electrical corporation as defined in in California Public Utilities Code section 218. For purposes of this EPIC solicitation, it includes Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Edison Co. |
| Large commercial building | For purposes of this solicitation, a building that is over 100,000 square feet and is served by a hot water or steam distribution system for heating and a central chiller system. |
| Low GWP Refrigerant | For purposes of this solicitation, a GWP less than 10. |
| 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)  |
| MBH | 1,000 BTUs per hour. |
| 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. |
| Photovoltaic | An electrical device that converts the energy of light directly into electricity by the photovoltaic effect. |
| Pilot Test | Pilot test means small scale testing in the laboratory or testing on a small portion of the production line of the affected industry. Pilot tests help to verify the design and validity of an approach, and adjustments can be made at this stage before full-scale demonstrations. |
| Principal Investigator | The technical lead for the applicant’s project, who is responsible for overseeing the project; in some instances, the Principal Investigator and Project Manager may be the same person.  |
| Project Manager | The person designated by the applicant to oversee the project and to serve as the main point of contact for the CEC. |
| Project Partner | An entity or individual that contributes financially or otherwise to the project (e.g., match funding, provision of a test, demonstration or deployment site), and does not receive CEC funds.  |
| Recipient | An entity receiving an award under this solicitation. |
| Solicitation | This entire document, including all attachments, exhibits, any addendum and written notices, and questions and answers (“solicitation” may be used interchangeably with “Grant Funding Opportunity”).  |
| State | State of California. |
| Title 24  | Building Energy Efficiency Standards (Title 24, Parts 6 and 11). For the recent 2022 standards refer to: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards. |
| Ton | One ton of refrigeration capacity is 12,000 BTU per hour. |
| 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> |
| Ultra-low GWP | For purposes of this solicitation, ultra-low is a GWP less than or equal to 4. A low-GWP refrigerant is less than or equal to 10. |
| Under-Resourced Communities | Under-resourced communities refer to communities that lack energy-related resources and should be prioritized for investments to increase those resources. |

## Project Focus

The project focuses on developing, testing, and demonstrating HVAC decarbonization solutions for large commercial buildings with an emphasis on technology advancements and replicability.

HVAC decarbonization technologies considered for this solicitation must meet all the following requirements:

1. Have high efficiency, minimum Coefficient of Performance (COP) of 3, unless otherwise noted.
2. Use low or ultra-low global-warming potential refrigerants for space conditioning.
3. Use electricity or other low/zero carbon fuel as a power source.
4. Capable of being integrated with other heat pumps and/or thermal systems where an existing boiler could supply a portion of the heating load.
5. Meet at least 25 percent of the peak building design heating load with an electric heat pump, heat recovery chiller, or other low carbon advanced system. **Group 1 only.**

[~~Though not required,~~~~an~~] **An** HVAC decarbonization technology that meets the following requirements would be considered more favorably during the evaluation and scoring:

1. Has potential to exceed current Title 24 energy efficiency requirements and/or Title 20 appliance efficiency standards.
2. Provides cost-effective energy savings (e.g., payback within the life of the equipment, including reduction in operation and maintenance costs) as shown by demonstration and independent measurement and verification testing**:**
	* **Group 1 for existing buildings: [~~, including]~~** at least 12 months pre-installation and a minimum of 12 months post installation.
	* **Groups 2 and 3: at least 12 months pre-installation (if testing the advanced HVAC system in a building), and minimum of 12 months of post installation, or**

**at least 12 months of M&V testing of the HVAC hardware in a lab.**

1. Includes controls to enable energy resiliency and grid flexibility to minimize electric load during net peak, such as between 4 pm and 9 pm, and maximizing electricity use when renewable energy is plentiful. **Group 1 only.**
2. **Partners with a mechanical system manufacturer to ensure a path for equipment deployment, servicing, and maintenance after the grant is completed (Group 1), or partners with a mechanical system manufacturer to ensure a path for equipment advancement and commercialization after the grant is completed (Groups 2 and 3)**.

### All [~~commercial building]~~ demonstrations (Group 1) and testing in commercial buildings (optional for Groups 2 and 3) must occur in a California electric investor-owned utility (IOU) service territory but laboratory testing (Groups 2 and 3) does not need to occur in a CA IOU territory.

### Group 1: Technology demonstrations must occur in an existing building ~~[at least one large commercial building]~~ that measures over 100,000 square feet and currently has a hot water or steam heat distribution system or the aggregate of multiple buildings that total over 100,000 square feet if served by a central system. Demonstrations of more than one technology must include separate monitoring and verification (M&V) of project benefits to determine the impacts of each technology. For integration of demand responsive controls, the M&V must include baseline without controls and the operation with the controls to show the load reductions (e.g., shift or shed). Buildings located in and demonstrating benefits to under-resourced communities will receive additional points during scoring.

### Groups 2 and 3: Technology testing can be done in a laboratory or at an existing building of any size if applicable to large commercial buildings. Testing of more than one technology must include separate M&V to determine the impacts of each technology. If the test will be in a smaller building, the applicant must explain how it would be relevant to large commercial buildings.

### Group 1: Large Hybrid or Stand-Alone Low GWP Electric Heat Pump Systems

Develop and test large, hybridized or stand-alone heating and cooling systems (over 100 tons) that use a heat recovery chiller or heat pump during low load conditions and use boilers and chillers during high load situations. The research will demonstrate the use of right-sized, high-efficiency[[5]](#footnote-6), low-GWP[[6]](#footnote-7) electric heat pumps that can minimize the use of existing boilers and chillers while being cost-effective for building owners. These high-efficiency heat pumps could be designed for full use during the “shoulder” months (spring and fall) or at other times when building conditions could be served mainly by heat pumps. The existing boilers and chillers will operate only as needed when the heat pumps are unable to provide peak heating and cooling to meet the temperature needs of building occupants, or when economic or grid conditions justify the operation of boilers. The initial technology readiness level (TRL) will be **5** [~~6~~] to 8 and progress at least one level by the end of the agreement.

Additional features may include:

* Use of stand-alone new low GWP electric heat pump that is not integrated with existing boilers or chillers.
* Hybrid electric solution that provides operational flexibility to building operators (heat pump and boiler/chiller).  EPIC funds can only be used for electric solutions.
* Alternative electric hybrid heating loop with thermal storage with or without a back-up boiler.

Potential eligible technologies are listed in Table 1.  The advanced HVAC solution can include one technology or an integrated system solution involving multiple technologies. However, the energy savings and benefits for each technology must be identified separately **and** when integrated to show the interactive effects.

Table 1 – Summary of Potential Technologies/Systems for Group 1

| Technology/Systems | Problems/ Challenges | Research Goal |
| --- | --- | --- |
| **Large Hybrid or Stand-Alone Low GWP Electric Heat Pump Systems**  Potential technologies:* **Stand-alone, low GWP heat pumps**. Can include:
* Air-source or water-cooled heat pump operating in heating-only mode to provide a portion of the building’s heating hot water (HHW) needs.
* Air-source heat pump in a two pipe or a water-cooled heat pump in a four-pipe configuration in heating-only mode that will tie into the building’s chilled water system to reject cooling water.
* **Stand-alone water-cooled heat recovery chiller** operating in heating-only mode to provide a portion of the building’s HHW needs. This option will operate in a four-pipe configuration in heating-only mode that will tie into the building’s chilled water system to reject cooling water.
* **Hybrid electric solution that provides operational flexibility to building operators** (heat pump working in conjunctions with a boiler/chiller).  EPIC funds can only be used for electric technologies.
* **Alternative electric hybrid heating loop** with thermal storage with or without a back-up boiler. EPIC funds can only be used for electric technologies.
 | * Fossil gas boilers emit a significant amount of carbon dioxide and other air pollutants.
* Condensing boilers distribute HHW at 180 degrees F to terminal units. This temperature is hotter than water supplied by heat pumps, typically between 110 to 135 degrees F.
* The COP will increase at a lower HHW supply temperature, but there could be limitations of the coil configuration due to lower temperatures.
* Current technologies do not maximize heat recovery. For instance, chillers without heat recovery emit waste heat and evaporate a significant amount of water.
* Buildings cannot store large amounts of hot water.
 | Electric heat pump or heat recovery chiller must carry at least 25 percent of peak thermal load of system with a COP greater than 3 in cooling and heating mode. |

The Project Narrative (Attachment 3) must discuss the following in the sections identified and include references and assumptions to justify your responses:

* Technical Merit:
* Describes how the demonstrated technology can accomplish the following:
	+ 1. Be a transformative technology for decarbonizing large commercial buildings, including target markets and why they are being targeted.
		2. Meet or exceed the minimum requirements and resolve the problems and challenges identified in Table 1.
		3. Be replicable in similar facilities with minimal government or other incentives needed for widespread deployment of future installations. Include letters of support from owners of similar facilities.
		4. Have technical, regulatory, and manufacturing support for the technologies, including a demonstrated pathway for widespread deployment.
	+ Describes the demonstration building by providing information on the use, operating schedule, and both baseline and proposed annual energy use and operating cost ($/year in energy cost) of the existing HVAC system.
	+ Describes the demonstrated technology, including:
		- Proposed cost of the new HVAC system to be demonstrated and estimated cost when commercially available.
		- Estimated annual energy consumption in comparison to standard commercially available technologies (e.g., kilowatt hours (kWh)/year).
		- Estimated annual energy cost savings of the new HVAC system.
		- Estimated performance metrics such as COP, hot water operating temperature, percent of load, and equipment sizing of the advanced system.
		- How the advanced technology will interact with and/or replace the existing system or incumbent standard system and meet the research goal in Table 1.
		- Estimated simple payback both at the end of the grant and when commercially available and deployed to large commercial buildings. Simple payback is the incremental cost difference between the new advanced HVAC system and the current system divided by the annual energy cost savings. Include any estimated increases in non-energy operational costs (e.g., maintenance).
* Technical Approach:
	+ Discuss how CEC funding can overcome the challenges and barriers of the advanced technology.
	+ Provide a literature review that provides an evaluation of existing available zero greenhouse gas (GHG) emission electric technology with a GWP of 10 or less that meets the HVAC needs of large commercial buildings and provide references on any capacity limits or other restrictions on equipment being recommended as part of a decarbonization solution. This review must include but not be limited to current TRL, costs, major challenges, and capacities.

**Group 2: Ultra-Low-GWP HVAC Heat Pump Advancements:**

Develop and test advanced, cost-competitive, high-efficiency large air-source and water-source heat pumps that use ultra-low-GWP refrigerants. This research will test air-source heat pumps from 20 to 50 tons, or water-source heat pumps 100 tons or less. Both heat pumps must use an ultra-low-GWP refrigerant (GWP less than or equal to 4), have a coefficient of performance greater than or equal to 3 in heating and cooling mode, and cost less than $500/ton when widely deployed. Current TRL is 4 to **6 ~~[5]~~** and will progress at least two levels by the end of the project.

Eligible systems may include primary/secondary heat pump systems using working fluids to support use of ultra-low GWP refrigerants.

The Project Narrative (Attachment 3) must discuss the following in the sections identified:

* Technical Merit:
* Describes how the demonstrated technology can accomplish the following:
	+ 1. Be a transformative technology for decarbonizing large commercial buildings, including target markets and why they are being targeted.
		2. Meet or exceed the minimum requirements and resolve the problems and challenges identified in Table 2.
		3. Be replicable in similar facilities with minimal government or other incentives needed for future installations. Include letters of support from owners of similar facilities.
		4. Have technical, regulatory, and manufacturing support for the technologies, including a demonstrated pathway for widespread deployment.
	+ **For Group 2, testing can occur in a laboratory or at an existing commercial building. If doing the latter, include** [~~the demonstration building by providing~~] information on the use, operating schedule, and both baseline and proposed annual energy use and operating cost ($/year in energy cost) of the existing HVAC system.
	+ Describes the demonstrated technology, including:
		- Proposed cost of the new HVAC system to be demonstrated and estimated cost when commercially available.
		- Estimated annual energy consumption in comparison to standard commercially available technologies (e.g., kWh/year).
		- Estimated annual energy cost savings of the new HVAC system **compared to standard system that meets current state building/appliance standards.**
		- Estimated performance metrics such as COP, hot water operating temperature, percent of load and equipment sizing of the advanced system **compared to standard system that meets current state building/appliance standards**.
		- How the advanced technology will interact with and/or replace ~~[the existing system o~~r] incumbent standard system and meet the research goal in Table 2.
		- Estimated simple payback both at the end of the grant and when commercially available and deployed to large commercial buildings. Simple payback is the incremental cost difference between the new advanced HVAC system and the current system divided by the annual energy cost savings. Include any estimated increases in non-energy operational costs (e.g., maintenance).
* Technical Approach:
	+ Discuss how CEC funding can overcome the challenges and barriers of the advanced technology.
	+ Provide a literature review that includes an evaluation of existing zero GHG emission, electric HVAC technology with a GWP of 4 or less that can help large commercial buildings decarbonize while meeting their heating and cooling needs, and provide references on any capacity limits or other restrictions on equipment being recommended as part of a decarbonization solution. This review must include, but not be limited to, the TRL, costs, major challenges, and capacities.

Table 2 – Summary of Potential Technologies/Systems for Group 2

| Technology/Systems | Problems/ Challenges | Research Goal |
| --- | --- | --- |
| **Ultra-Low-GWP HVAC Heat Pump Advancements.** Potential technologies:* Air-source heat pumps from 20 to 50 tons, that use an ultra-low-GWP refrigerant, have a COP greater than 3 in heating and cooling mode and competitive unit price when widely deployed.
* Water-source heat pumps that are 100 tons or less, use an ultra-low-GWP refrigerant, have a COP greater than 3 in heating and cooling mode) and a competitive unit price when widely deployed.
 | * An ultra-low GWP refrigerant like CO2 is transcritical and operates above the critical pressure but is not easily condensed.
* CO2 as a refrigerant in cooling mode is challenged at ambient temperatures above the condensing temperature.
* Developing a CO2 heat pump that can provide heating and cooling to a large building represents an innovative challenge.
* Developing a Propane heat pump that can provide heating and cooling to a large building represents an innovative challenge.
 | * Refrigerant GWP ≤ 4.
* COP greater than 3 in heating and cooling mode.
* Competitive price point (such as less than $500/ton).
 |

 **Group 3: Other Advanced HVAC Technologies**

Test, develop, and demonstrate other types of HVAC technologies, such as non-vapor compression cooling, solid-state cooling, thermo-elastic cooling, indirect cooling, personal comfort devices, cost-effective ground-source heat pumps, and other innovative technologies. These technologies must use zero GWP refrigerants. Current TRL is 3 to **5** ~~[4~~] and will progress at least one level by the end of the project.

* The Project Narrative (Attachment 3) must discuss the following in the sections identified:

The Project Narrative (Attachment 3) must discuss the following in the sections identified:

* Technical Merit:
* Describes how the demonstrated technology can accomplish the following:
	+ 1. Meet or exceed the minimum requirements and resolve the problems and challenges identified in Table 3.
		2. Be replicable in similar facilities with minimal government or other incentives needed for future installations. Include letters of support from owners of similar facilities.
		3. Have technical, regulatory, and manufacturing support for the technologies, including a demonstrated pathway for widespread deployment.
	+ **For Group 3, testing can occur in a laboratory or an existing commercial building. If doing the latter, include** [~~If applicable, describes the demonstration building by providing~~] information on the use, operating schedule, and both the baseline and proposed annual energy use and operating cost ($/year in energy cost) of the existing HVAC system.
	+ Describes the demonstrated technology, including:
		- Proposed cost of the new HVAC system to be demonstrated and estimated cost when commercially available.
		- Estimated annual energy consumption in comparison to standard commercially available technologies (e.g., kWh/year).
		- Estimated annual energy cost savings of the new HVAC system **in comparison to standard technology that meets current state building/appliance standards**..
		- Estimated performance metrics such as COP, hot water operating temperature, percent of load, and equipment sizing of the advanced system **in comparison to a standard technology that meets current state building/appliance standards**..
		- How the advanced technology will interact with and/or replace the [~~existing system or~~] incumbent standard system and meet the research goal in Table 3.
		- Estimated simple payback at the end of the grant and when commercially available and deployed to large commercial buildings. Simple payback is the incremental cost difference between the new advanced HVAC system and the current system divided by the annual energy cost savings. Include any estimated increases in non-energy operational costs (e.g., maintenance).
* Technical Approach:
	+ Discuss how CEC funding can overcome the challenges and barriers of the advanced technology.
	+ Provide a literature review that includes an evaluation of existing zero GHG emission, electric/zero carbon HVAC technology that can help large commercial buildings decarbonize while meeting their heating and cooling needs, and provide references on any capacity limits or other restrictions on equipment being recommended as part of a decarbonization solution. This review must include, but not be limited to, the TRL, costs, major challenges, and capacities.

Table 3 – Partial List of Potential Technologies/Systems for Group 3

| Technology/Systems | Problems/ Challenges | Research Goal |
| --- | --- | --- |
| **Other Advanced HVAC Technologies**. Potential technologies:* Non-vapor compression cooling
* Solid-state cooling
* Thermo-elastic cooling
* Personal comfort devices
* Cost-effective ground-source heat pump[~~s~~] **boring techniques**
* Use of eutectics to store energy from compressor for use in heating water for building heating (not domestic water).
* Other technologies, including desiccant combined with innovative heat storage.
* Other efficient electric non-vapor compression technology.
 | * Indirect evaporative cooling has achieved 120% wet bulb effectiveness, but difficult to move a significant amount of air at a low wattage.
* Thermo-elastic cooling and heating has been developed at a 400 watt prototype level with a COP of 4. This technology must be sized up to 1,000 watts and have a COP of 5 or greater for further advancement.
* Personal comfort devices using solid state electronics and the Peltier effect have a cold and hot junction. Need cost-effective low energy desktop device that can heat and cool and potentially store waste heat at low energy.
* Ground source heat pumps can improve the COP, but earth borings remain expensive.
* Technologies such as desiccant cooling combined with innovative heat storage for space heating using a heat pump in a single unit that can switch between cooling and heating could be challenging.
 | * Cost effective advanced evaporative coolers > 130% wet bulb effectiveness at 2,000 cubic feet per minute and low energy with 0.25 kW/ton (or less) of cooling and Water Efficiency Ratio of 0.37 (kWh/liter). COP of at least 11.7.
* Thermo-elastic heating/cooling such as 1,000W prototype with high efficiency, such as COP of at least 5.
* Personal comfort devices/thermoelectric heating and cooling < 100 W with COP of greater than or equal to 1.
* Cost effective ground source heat pumps with boring techniques of less than or equal to $333/ton.
 |

## Funding

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

There is **up to $20,000,000** total funding under this solicitation**. The amounts per group** available for this grant are listed below. The total, minimum, and maximum funding amounts for each project group are listed below.

**[~~Disadvantaged or Low-income Communities~~]**

[~~For Group 1, additional points will be provided for demonstrations located in and benefitting low income or disadvantaged communities.]~~

| Project Group | Available funding | Minimum award amount | Maximum award amount | Minimum match funding(% of EPIC Funds Requested) |
| --- | --- | --- | --- | --- |
| Group 1: Large Hybrid or Stand-Alone Electric Hybrid System | $12M | $2M  | $6M | 20% |
| Group 2: Low-GWP HVAC Heat Pump Advancements  | $4M | $1M  | $2M | 20% |
| Group 3: Other Advanced HVAC Technologies | $4M | $1M  | $2M | 20% |

1. **Match Funding Requirement**

Match funding in the amount of 20 percent of the EPIC funds is required.

For the definition of match funding see Section I K.

1. **Change in Funding Amount**

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

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

## Key Activities Schedule

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

| ACTIVITY | DATE | TIME[[7]](#footnote-8)  |
| --- | --- | --- |
| Solicitation Release | 06/16/2023  |   |
| **Pre-Application Workshop** | 07/14/2023 | 1:00 p.m. |
| **Deadline for Written Questions[[8]](#footnote-9)** | 07/19/2023 | **5:00 p.m.** |
| Anticipated Distribution of Questions and Answers | Week of 08/1/2023  |  |
| **Deadline to Submit Applications** | [9/15/23] **10/20/2023** | **11:59 p.m.** |
| Anticipated Notice of Proposed Award Posting Date | [~~11/15/2023~~] **12/15/2023**  |  |
| Anticipated Energy Commission Business Meeting Date | [~~11/29/2023~~] **3/10/2024** |  |
| Anticipated Agreement Start Date | ~~[1/20/2024~~] **4/1/2024** |  |
| Anticipated Agreement End Date  | 03/29/2029 |  |

## Notice of Pre-Application Workshop

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

**Date and time: 7/14/2023 1:00 p.m. – 3:00 p.m.**

**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.

Please click the link below to join the webinar:

https://energy.zoom.us/j/87116437945?pwd=SzFRU0p3QnBlN0NQN0VqblBRcjNjdz09

**Meeting ID: 871 1643 7945**

**Meeting Password:** meeting@1

**Topic:** GFO-22-308 Pre-Application Workshop

**Telephone Access Only:**

**Or Telephone:**

**Dial:**

**US: +1 669 219 2599 or +1 213 338 8477 or +1 206 337 9723 or +1 346 248 7799 or +1 602 753 0140 or +1 720 928 9299 or +1 971 247 1195 or +1 929 436 2866 or +1 646 518 9805 or +1 651 372 8299 or +1 786 635 1003**

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:**

Or iPhone one-tap:

US: +16692192599,,87116437945# or +12133388477,,87116437945#

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

**Technical Support:**

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

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

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

[https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-](https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-%20Windows-macOS-and-Linux)

[Windows-macOS-and-Linux](https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-%20Windows-macOS-and-Linux). If you have a disability and require assistance to participate, please contact 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, direct questions to the Commission Agreement Officer listed below:

 Eilene Cary, Commission Agreement Officer

California Energy Commission

715 P Street, MS-18

Sacramento, California, 95814

Telephone: (916) 776-0739

E-mail: Eilene.Cary@energy.ca.gov

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

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

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

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

## Applicants’ Admonishment

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

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

1. **additional requirements**
2. Time is of the essence. Funds available under this solicitation have encumbrance deadlines as early as June 30, 2025.  This means that the CEC must approve proposed awards at a business meeting (usually held monthly) prior to June 30, 2025, in order to avoid expiration of the funds. Prior to approval and encumbrance, the CEC must comply with the California Environmental Quality Act (CEQA). To comply with CEQA, the Commission must have CEQA-related information from applicants and sometimes other entities, such as local governments, in a timely manner. Unfortunately, even with this information, the Commission may not be able to complete its CEQA review prior to the encumbrance deadline for every project. For example, if a project requires an Environmental Impact Report, the process to complete it can take many months. For these reasons, it is critical that applicants organize project proposals in a manner that minimizes the time required for the Commission to comply with CEQA and provide all CEQA-related information to the Commission in a timely manner such that the Commission is able to complete its review in time for it to meet its encumbrance deadline.
3. Reservation of right to cancel proposed award. In addition to any other right reserved to it under this solicitation or that it otherwise has, if the CEC determines, in its sole and absolute discretion, that the CEQA review associated with a proposed project would not likely be completed prior to the encumbrance deadline referenced above, and that the Commission’s ability to meet its encumbrance deadline may thereby be jeopardized, the CEC may cancel a proposed award and award funds to the next highest scoring applicant, regardless of the originally proposed applicant’s diligence in submitting information and materials for CEQA review. Examples of situations that may arise related to CEQA review include but are not limited to:
* Example 1: If another state agency or local jurisdiction, such as a city or county, has taken the role of lead agency under CEQA, the CEC’s review may be delayed while waiting for a determination from the lead agency.
* Example 2: If the proposed work is part of a larger project for which a detailed environmental analysis has been or will be prepared by another state agency or local jurisdiction, the CEC’s review may be delayed as a result of waiting for a supplemental or initial analysis, respectively, from the other agency.
* Example 3: If the nature of the proposed work is such that a project is not categorically or otherwise exempt from the requirements of CEQA, and an initial study or other detailed environmental analysis appears to be necessary, the CEC’s review, or the lead agency’s review, may take longer than the time available to encumber the funds. If an initial study or environmental impact report has already been completed by another state agency or a local jurisdiction, serving as the lead agency, the applicant must ensure that such an analysis covers the work in the proposed project, or must obtain a revised analysis and determination from the lead agency reviewing the proposed project.
* Example 4: If the proposed project clearly falls under a statutory or categorical exemption, or is project for which another state agency or local jurisdiction has already adopted a CEQA finding that the project will cause no significant effect on the environment, the project will likely have greater success in attaining rapid completion of CEQA requirements.
* Example 5: If the proposed project will be conducted on tribal land, the Tribe having jurisdiction over the project may conduct environmental review under their own ordinances. The Energy Commission’s review may be delayed while waiting for a determination from the Tribe.

The above examples are not exhaustive of instances in which the CEC may or may not be able to comply with CEQA within the encumbrance deadline and are only provided as further clarification for potential applicants. Please plan project proposals accordingly.

1. **Background**
2. **Electric Program Investment Charge (EPIC) Program**

This solicitation will award projects funded by the EPIC, an electricity ratepayer surcharge established by the California Public Utilities Commission (CPUC) in December 2011.[[9]](#footnote-10) The purpose of the EPIC program is to benefit the ratepayers of the three IOUs, including Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Edison Co. The EPIC funds clean energy technology projects that promote greater electricity reliability, lower costs, and increased safety.[[10]](#footnote-11) In addition to providing IOU ratepayer benefits, funded projects must lead to technological advancement and breakthroughs to overcome the barriers that prevent the achievement of the state’s statutory energy goals.[[11]](#footnote-12) The EPIC program is administered by the CEC and the IOUs.

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

EPIC projects must fall within the following **program areas** identified by the CPUC:

* Applied research and development;
* Technology demonstration and deployment; and
* Market facilitation.

In addition, projects must fall within one of the general focus areas (**“strategic objectives”**) identified in the CEC’s EPIC Investment Plans[[12]](#footnote-13) [[13]](#footnote-14) and within one or more specific focus areas (**“funding initiatives”**) identified in the plan. This solicitation targets the following program area(s), strategic objective(s), and funding initiative(s):

2021- 2025 Electric Program Investment Charge (EPIC) Fourth Investment Plan

* **Program Area**: Improve the Customer Value Proposition of End-Use Efficiency and Electrification Technologies
* **Strategic Objective:** S1
	+ **Funding Initiative 30.** HVAC Decarbonization for Large Buildings

**Applicable Laws, Policies, and Background Documents**

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

Laws/Regulations

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

SB 32 expands on AB 32 by requiring that the California Air Resources Board 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.

* **AB 758, Building Efficiency[[14]](#footnote-15)**

AB 758 requires the CEC to collaborate with the CPUC and stakeholders to develop a comprehensive program to achieve greater energy and water savings in existing residential and nonresidential buildings. The CEC developed the *Existing Buildings Energy Action Plan* in August 2015.

Additional information: <https://www.energy.ca.gov/efficiency/existing_buildings/documents/ab_758_bill_20091011_chaptered.pdf> <https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100AB758>

Applicable Law: California Public Resources Code § 25943, California Public Utilities Code §§ 381.2 and 385.2

* **SB 350[[15]](#footnote-16) Clean Energy and Pollution Reduction Act of 2015,**

SB 350 does the following: 1) expands California’s RPS goals and requires retail sellers of electricity and local publicly owned electricity to increase their procurement of eligible renewable energy resources; 2) requires the CEC 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) provide for transformation of the California 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

* **Appliance Efficiency Regulations**

The CEC promulgates appliance efficiency regulations that require manufacturers of various new appliances sold or offered for sale in California to test them using specified test methods. Covered appliances include refrigerators, air conditioners, heaters, plumbing fitting/fixtures, lighting, washers, dryers, cooking products, electric motors, transformers, power supplies, televisions, and battery charger systems.

Additional information: http://www.bsc.ca.gov/; http://www.energy.ca.gov/appliances/

Applicable Law: California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4, §§ 1601 et. seq.

* **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

Policies/Plans

* ~~[~~[~~http://www/~~](http://www/)]**2019 California Energy Efficiency Action Plan**

The Energy Efficiency Action Plan expands on the Existing Buildings Energy Action Plan and includes topics related to existing buildings’ energy efficiency, low-income barriers to energy efficiency, and doubling energy efficiency by 2030. The SB 350 Doubling of Energy Efficiency by 2030 report expands beyond existing buildings to include agriculture, industry, newly constructed buildings, conservation voltage reduction, and electrification. This report combines these topics with the Existing Buildings Energy Efficiency Action Plan to create a comprehensive statewide energy efficiency action plan.

Additional information: https://www.energy.ca.gov/filebrowser/download/1900

Reference Documents

* **CEC-funded Guidebook to help the healthcare industry decarbonize.**[[16]](#footnote-17)

The guidebook is a tool to aid California hospitals in the planning and design of retrofit projects to help them decarbonize and reduce operating costs.

* **CEC-funded research on ground-source heat pumps[[17]](#footnote-18); next-generation, high-efficiency heat pumps**[[18]](#footnote-19)**~~[; and variable refrigerant flow and indirect evaporative cooling systems~~].**

The research documented the benefits and value proposition of these applications.

* **Stanford University study that documented the savings and benefits of** **using heat-recovery chillers to satisfy about 90 percent of heating needs and the gas system about 10 percent.**
* **CEC-funded research on Climate Appropriate Innovations for Variable Refrigerant Flow Systems.[[19]](#footnote-20)**

**The research documented the development of a prototype of a CO2 and propane heat pump used for space heating and cooling.**

The hybrid configuration reduces GHG emissions by 68 percent and water consumption by18 percent.[[20]](#footnote-21)

* **ACEEE’s analysis of the energy savings and emissions reductions that can be achieved by installing heat pumps of various types at the time existing fossil-fuel systems need replacement.**[[21]](#footnote-22)
* **CEC-funded analysis of ground source heat pumps that showed an average of 44 percent HVAC-related energy reduction across California, with the highest savings of 77 percent in Climate Zone 1.** [[22]](#footnote-23)

Study developed and tested a new, less expensive ground source heat exchanger technology for implementing ground source heat pumps. The large-diameter shallow bore technology is roughly one-third the cost of the deep bore technology.

* **Information provided by stakeholders during the June 28, 2021, EPIC 2021-2025 Investment Plan Building Decarbonization Workshop.** [[23]](#footnote-24)
1. **Match Funding**
* **“Match funds”** includes cash or in-kind (non-cash) contributions provided by the applicant, subcontractors, or other parties including pilot testing, demonstration, and/or deployment sites (e.g., test site staff services) that will be used in performance of the proposed project.

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

Definitions of “match funding” categories are listed below:

* + - **“Cash”** **match** means funds that are in the recipient’s possession or proposed by match partner and clearly identified in a support letter, and are reserved for the proposed project, meaning that they have not been committed for use or pledged as match for any other project. Cash match can include funding awards earned or received from other agencies for the proposed technologies or study (but not for the identical work). Proof that the funds exist as cash is required. Cash match will be considered more favorably than in-kind contributions during the scoring phase.
		- **“In-Kind”** **match** is typically in the form of the value of personnel, goods, and services, including direct and indirect costs. This can include equipment, facilities, and other property as long as the value of the contribution is based on documented market values or book values, prorated for its use in the project, and depreciated or amortized over the term of the project using generally accepted accounting principles (GAAP).
* Match funds must be spent only during the agreement term, either before or concurrently with EPIC funds. Match funds also must be reported in invoices submitted to the CEC.
* All applicants providing match funds must submit commitment letters, **including prime and subcontractors**, that: (1) identify the source(s) of the funds; (2) justify the dollar value claimed; (3) provide an unqualified (i.e., without reservation or limitation) commitment that guarantees the availability of the funds for the project; and (4) provide a strategy for replacing the funds if they are significantly reduced or lost. Please see Attachment 11, Commitment and Support Letter Form. Commitment and support letters must be submitted with the application to be considered.
* Any match pledged in Attachment 1 must be consistent with the amount or dollar value described in the commitment letter(s) (e.g., if $5,000 “cash in hand” funds are pledged in a commitment letter, Attachment 1 must match this amount). Only the total amount pledged in the commitment letter(s) will be considered for match funding points.

 Examples of preferred match share:

* + - **“Travel”** refers to all travel required to complete the tasks identified in the Scope of Work. Travel includes in-state and out-of-state, and travel to conferences. EPIC funds are limited to lodging and any form of transportation (e.g., airfare, rental car, public transit, parking, mileage). Use of match funds for out-of-state travel is encouraged, as the CEC discourages and may not approve the use of its funds for such travel. If an applicant plans to travel to conferences, including registration fees, they must use match funds. Applicants shall adhere to travel restrictions of using state funds to travel to certain other states pursuant to AB 1887 (2016) and codified at California Government Code Section 11139.8. All applicants are encouraged to consider the Attorney General’s website https://oag.ca.gov/ab1887 for a current list of states subject to travel restrictions. Awarded Grants under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.
		- **“Equipment”** is an item with a unit cost of at least $5,000 and a useful life of at least one year. **Purchasing equipment with match funding is encouraged** as there are no disposition requirements at the end of the agreement for such equipment. Typically, grant recipients may continue to use equipment purchased with CEC funds if the use is consistent with the intent of the original agreement.
		- **“Materials”** under Materials and Miscellaneous are items under the agreement that do not meet the definition of Equipment (unit cost of at least $5,000 and a useful life of at least one year). **Using match funds for purchasing items such as laptops, notebooks and/or personal tablets is encouraged, as Energy Commission funds for these purchases is not allowed.**
1. **Funds Spent in California**
* Only CEC reimbursable funds count towards the funds spent in California total.
* "Spent in California" means that:
	+ (1) Funds in the "Direct Labor category and all categories calculated based on direct labor (e.g., fringe benefits, indirect costs and profit) are paid to individuals that pay California state income taxes on wages received for work performed under the agreement. Payments made to out-of-state workers do not count as “funds spent in California.” However, funds spent by out-of-state workers in California (e.g., hotel and food) can count as “funds spent in California.”; AND
	+ (2) Business transactions (e.g., material and equipment purchases, leases, and rentals) are entered into with a business located in California.
	+ (3) Total should include any applicable subcontractors.
* Airline ticket purchases for out-of-state travel and payments made to out-of-state workers are not considered funds “spent in California.” However, funds spent by out-of-state workers in California (e.g., lodging) and airline travel originating and ending in California are considered funds “spent in California.” A business located in California means: 1) businesses registered with Secretary of State AND 2) transaction is with a location in California that is directly related to the grant project (e.g., direct purchase of material and equipment to be used in the grant) and results in the support of California business and jobs.
	+ Example 1: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from a California-based supply house. The invoice shows that the transaction occurred with the California-based supply house. This transaction is eligible and can be counted as funds spent in California.
	+ Example 2: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from Texas. The manufacturer has training centers in California that instruct purchasers on how to use the sensors. The invoice shows that the transaction occurred in Texas. This transaction is not eligible and cannot be counted as funds spent in California.

# II. Eligibility Requirements

## Applicant Requirements

1. **Eligibility**

This solicitation is open to all public and private entities with the exception of local publicly-owned electric utilities.[[24]](#footnote-25) In accordance with CPUC Decision 12-05-037, funds administered by the CEC may not be used for any purposes associated with local publicly-owned electric utility activities.

1. **Terms and Conditions**

Each grant agreement resulting from this solicitation will include terms and conditions that set forth the recipient’s rights and responsibilities. By signing the Application Form (Attachment 1), each applicant agrees to enter into an agreement with the CEC to conduct the proposed project according to the terms and conditions that correspond to its organization, without negotiation: (1) University of California and California State University terms and conditions; (2) U.S. Department of Energy terms and conditions; (3) special terms and conditions for Tribes and tribal corporations; and (4) standard terms and conditions. All terms and conditions are located at http://www.energy.ca.gov/research/contractors.html, with the exception of special terms and conditions for California Native American Tribe (Tribe) or a California Tribal Organization (Tribal Organization), which will be posted on this GFO website. Please refer to the applicable EPIC Grant terms and conditions. Failure to agree to the terms and conditions by taking actions such as failing to sign the Application Form or indicating that acceptance is based on modification of the terms will result in **rejection** of the application. Applicants **must** **read** the terms and conditions carefully.The CEC reserves the right to modify the terms and conditionsprior to executing grant agreements.

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

1. A resolution or other authorizing document by the governing body of the Tribe or Tribal Organization authorizing the Tribe or Tribal Organization to enter into the proposed agreement, including accepting the Special Terms and Conditions for California Native American Tribes and California Tribal Organizations with Sovereign Immunity (see Attachment 14).

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.

1. **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.

1. **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.

1. **Disadvantaged & Low-income Communities**

At least 25 percent of available Electric Program Investment Charge (EPIC) technology demonstration and deployment funding must be allocated to project sites located in, and benefiting, disadvantaged communities; and an additional minimum 10 percent of funds must be allocated to projects sites located in and benefiting low-income communities.[[25]](#footnote-26) The CEC in administering EPIC must also take into account adverse localized health impacts of proposed projects to the greatest extent possible,[[26]](#footnote-27) and give preference for funding to clean energy projects that benefit residents of low-income or disadvantaged communities.[[27]](#footnote-28)

The CEC is committed to ensuring all Californians have an opportunity to participate in and benefit from programs and services. While it is not required that Group 1 [~~and Group 2]~~ projects complete the demonstration within a DAC/LIC and/or Tribe, demonstration projects located and benefiting DACs/LICs and/or Tribes will be eligible for preference points under the scoring criteria for this GFO.

Disadvantaged Communities are those designated pursuant to Health and Safety Code section 39711 as representing the 25 percent highest scoring census tracts in CalEnviroScreen or other areas with high amounts of pollution and low populations as identified by CalEPA. Please see https://calepa.ca.gov/envjustice/ghginvest/ for the most current CalEPA designations.

“Low-income communities” are defined as communities within census tracts with median household incomes at or below either of the following levels:

1. Eighty percent of the statewide median income.
2. The applicable low-income threshold listed in the state income limits updated by the Department of Housing and Community Development and filed with the Office of Administrative Law pursuant to subdivision (c) of Section 50093 of the Health and Safety Code.

Visit the California Department of Housing & Community Development site for the current HCD State Income Limits at: <https://www.hcd.ca.gov/grants-and-funding/income-limits>. Disadvantaged communities are defined as areas representing census tracts scoring in the top 25 percent in CalEnviroScreen. For more information on disadvantaged communities and to determine if your project is in a disadvantaged community, use the California Communities Environmental Health Screening tool (CalEnviroScreen) at:

https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Another resource is the Healthy Places Index Tool for California, located at: <https://healthyplacesindex.org/>.

## Project Requirements

1. **Technology Demonstration and Deployment Stage**

Projects must fall within the “technology demonstration and deployment” stage, which involves the installation and operation of pre-commercial technologies or strategies at a scale sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable appraisal of operational and performance characteristics, and of financial risks.**[[28]](#footnote-29)**

1. **Benefits, Technological Advancements, and Breakthroughs**

**California Public Resources Code Section 25711.5(a) requires EPIC-funded projects to:**

* **Benefit electricity ratepayers; and**
* **Lead to technological advancement and breakthroughs to overcome the barriers that prevent the achievement of the state’s statutory energy goals.**

**EPIC's mandatory guiding principle is to provide ratepayer benefits, which is defined as (1) improving safety, (2) increasing reliability, (3) increasing affordability, (4) improving environmental sustainability, and (5) improving equity, all as related to California's electric system.[[29]](#footnote-30)**

**Accordingly, the Project Narrative Form (Attachment 3) and the “Goals and Objectives” section of the Scope of Work Template (Attachment 5) must describe how the project will: (1) benefit California IOU ratepayers by improving safety, increasing reliability, increasing affordability, improving environmental sustainability, and improving equity, all as related to California's electric system; and (2) lead to technological advancement and breakthroughs to overcome barriers to achieving the state’s statutory energy goals. Any estimates of energy and water savings or GHG impacts must be calculated using the References for Calculating Electricity End-Use, Electricity Demand, and GHG Emissions (Attachment 13).**

1. Technology Transfer Expenditures

**To maximize the impact of EPIC projects and to promote the further development and deployment of EPIC-funded technologies, a minimum of 5 percent of CEC funds requested should go towards technology transfer activities. Appropriate technology transfer activities for this solicitation are listed in the Scope of Work Template (Attachment). The Budget Forms (Attachment) should clearly distinguish funds dedicated for technology transfer.**

1. Measurement and Verification Plan

The Project Narrative (Attachment 3) must include a Measurement and Verification Plan that describes how actual project benefits will be measured and quantified, such as by pre- and post-project energy use (kilowatt hours, kilowatts), water use (million gallons), and cost savings for energy, water, and other benefits. The activities proposed in the Measurement and Verification Plan must be included in the “Technical Tasks” section of the Scope of Work Template (Attachment 5).

1. ~~[Community Based Organizations and/or Tribal Engagement~~] 5. Tribal Engagement

~~[In TD&D solicitations with set aside funding for proposed projects located in and benefiting low-income, disadvantaged communities within IOU service territories, the project must allocate appropriate funding for CBO and/or tribal engagement for relevant tasks under the scope of work.~~

~~The CBO should meet, and will be evaluated on the following criteria for this solicitation:~~

* ~~Has an office in the region (e.g., air basin or county) and meets the demographic profile of the communities it serves.~~
* ~~Has deployed projects and/or outreach efforts within the region (e.g., air basin or county) of the proposed disadvantaged or low-income community.~~
* ~~Have official mission and vision statements that expressly identify serving disadvantaged and/or low-income communities.~~
* ~~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.]~~

For projects located in and benefiting Tribes, the Tribe must be included on the project team and within the project budget.

# 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)
 |
| **Maximum Page Limit Recommendations** | * **Executive Summary** (Attachment 2): **two** pages
* **Project Narrative Form** (Attachment 3): **twenty** pages excluding documentation for CEQA
* **Project Team Form** (Attachment 4): **two** pages for each resume
* **Reference and Work Product Form** (Attachment 9): **one** page for each reference, **two** pages for each project description
* **Commitment and Support Letter Form** (Attachment 10): **two** pages, excluding the cover page
* **Scope of Work** (Attachment 5): **thirty** pages
* **Project Schedule** (Attachment 6): **four** pages
* There are no page limits for the following:
	+ **Application Form** (Attachment 1)
	+ **Budget Forms** (Attachment 7)
	+ **CEQA Compliance Form** (Attachment 8)
	+ **Project Performance Metrics** (Attachment 11)
 |

## Method For Delivery

The only method of submitting applications to this solicitation is the CEC Grant Solicitation System (GSS), available at: https://gss.energy.ca.gov/. This online tool allows applicants to submit their electronic documents to the CEC prior to the date and time specified in this solicitation. Electronic files must be in Microsoft Word XP (.doc format) or newer and Excel Office Suite formats unless originally provided in the solicitation in another format.  Attachments requiring signatures may be scanned and submitted in PDF format.  Completed Budget Forms (Attachment 7) must be in Excel format.

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

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

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

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

## Application Content

Below is a general description of each required section of the application. Please reference each individual attachment for a detailed description of the information requested by that attachment. Completeness in submitting all the information requested in each attachment will be factored into application scoring.

Application Form (Attachment 1)

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

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Executive Summary Form (Attachment 2)

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

Project Narrative Form (Attachment 3)

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

**Group Specific Questions**

Include required group specific information (see Section I.C.) in the specified sections.

**Project Readiness**

Include information about the permitting required for the project and whether 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 within the timeframes specified in this solicitation (see Section I.E). All supporting documentation must be included in Attachment 8.

Project Team Form (Attachment 4)

Identify by name all key personnel[[30]](#footnote-31) assigned to the project, including the project manager and principal investigator (if applicable), and individuals employed by any major subcontractor (a major subcontractor is a subcontractor receiving at least 25 percent of Commission funds or $100,000, whichever is less). Clearly describe their individual areas of responsibility. Include the information required for each individual, including a resume (maximum two pages).

Scope of Work Template (Attachments 5)

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

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

Project Schedule (Attachment 6)

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.

Budget Forms (Attachment 7)

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

All project expenditures (match share and reimbursable) must be made within the approved agreement term. Match share requirements are discussed in Part I of this solicitation. The entire term of the agreement and projected rate increases must be considered when preparing the budget.

The budget must reflect estimates for **actual** costs to be incurred during the agreement term. The CEC may only approve and reimburse for actual costs that are properly documented in accordance with the grant terms and conditions. Rates and personnel shown must reflect the rates and personnel the applicant would include if selected as a Recipient.

The proposed rates are considered capped and may not change during the agreement term. The Recipient will only be reimbursed for **actual** rates up to the rate caps.

The budget must NOT include any Recipient profit from the proposed project, either as a reimbursed item, match share, or as part of overhead or general and administrative expenses (subcontractor profit is allowable, though the maximum percentage allowed is 10 percent of the total subcontractor rates for labor, and other direct and indirect costs as indicated in the Category Budget form). Please review the terms and conditions and budget forms for additional restrictions and requirements.

The budget must allow for the expenses of all meetings and products described in the Scope of Work. Meetings may be conducted at the CEC or by conference call, as determined by the Commission Agreement Manager.

Applicants must budget for permits and insurance. Permitting costs may be accounted for in match share. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement with CEC funds, with the exception of costs incurred by University of California recipients.

The budget must NOT identify that EPIC 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.

All applicants should go to the Attorney General’s website https://oag.ca.gov/ab1887 for a current list of states subject to travel restrictions. Grants awarded under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.

**Prevailing wage requirement:** Projects that receive an award of public funds from the CEC often involve construction, alteration, demolition, installation, repair or maintenance work over $1,000. For this reason, projects that receive an award of public funds from the CEC are likely to be considered public works under the California Labor Code. See Chapter 1 of Part 7 of Division 2 of the California Labor Code, commencing with Section 1720 and Title 8, California Code of Regulations, Chapter 8, Subchapter 3, commencing with Section 16000.

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

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

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

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

or,

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

**Russia Sanctions**

The budget must NOT identify that EPIC 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.

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

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

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

Reference and Work Product Form (Attachment 9)

Section 1: Provide applicant and subcontractor references as instructed.

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.

Commitment and Support Letter Form (Attachment 10)

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

Commitment Letters

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

If the project involves **demonstration** activities, the applicant must include a site commitment letter signed by an authorized representative of the proposed demonstration site. The letter should: (1) identify the location of the site (street address, parcel number, tract map, plot map, etc.) which must be consistent with Attachments 1 and 8. and (2) commit to providing the site for the proposed activities.

**Project partners** that are making contributions other than match funding or a demonstration 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.

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 demonstration site.

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Project Performance Metrics (Attachment 11)

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

Applicant Declaration (Attachment 12)

This form requests the applicant declare that they: are not delinquent on taxes nor suspended by the California Franchise Tax Board; are not currently being sued by any entity (public or private) or individual, and are not aware of any information that reasonably indicates they may be sued by any entity or individual during the proposed agreement term, that might reasonably be expected to materially impact the applicant’s ability to perform the proposed project; 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 request additional information from potential awardees before the CEC approves awards at a business meeting.

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.

References for Calculating Energy End-Use and GHG Emissions (Attachment 13)

Any estimates of energy savings or GHG impacts described in the application should be calculated as specified on this form, to the extent that the references apply to the proposed project.

**Special Terms And Conditions For California Native American Tribes And Tribal Organizations With Sovereign Immunity (Attachment 14)**

**This form must be completed only by California Native American Tribes and Tribal Organizations with Sovereign Immunity that apply.**

# 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** [~~105.0~~] **points** is required for criteria 1-**7** [~~8~~] to be eligible for funding. In addition, the application must receive a minimum score of **52.50 points for criteria 1−4 ~~[and 70.00 points for criteria 1-7~~]** 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 email 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 Public Interest Energy Research (PIER) agreement, has received the royalty review letter (which the CEC annually sends out to remind past recipients of their obligations to pay royalties), and has not responded to the letter or is otherwise not in compliance with repaying royalties.
* The applicant has received unsatisfactory agreement evaluations from the CEC or another California state agency.
* The applicant is a business entity required to be registered with the California Secretary of State and is not in good standing.
* The applicant has not demonstrated that it has the financial capability to complete the project.
* The applicant fails to meet CEQA compliance within sufficient time for the CEC to meet its encumbrance deadline or any other deadlines, as the CEC in its sole and absolute discretion may determine.
* The applicant has included a statement or otherwise indicated that it will not accept the terms and conditions, or that acceptance is based on modifications to the terms and conditions.
* The application contains confidential information or identifies any portion of the application as confidential.

## Miscellaneous

1. **Solicitation Cancellation and Amendment**

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

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

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

1. **Modification or Withdrawal of Application**

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

1. **Confidentiality**

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

1. **Solicitation Errors**

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

1. **Immaterial Defect**

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

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

Upon the posting of the NOPA, all applications and related materials submitted in response to this solicitation will become property of the State and publicly available records.

## Stage One: Application Screening

| **Screening Criteria** *The Application must pass ALL criteria to progress to Stage Two.* | **Pass/Fail** |
| --- | --- |
| 1. The application is received by the CEC’s Contracts, Grants, and Loans Office by the due date and time specified in the “Key Activities Schedule” in Part I of this solicitation and is received in the required manner (e.g., no emails or faxes).
 | [ ]  Pass [ ]  Fail |
| 1. The application Form (Attachment 1) is signed where indicated.
 | [ ]  Pass [ ]  Fail |
| 1. The Applicant Declaration Form (Attachment 12) is signed where indicated.
 | [ ]  Pass [ ]  Fail |
| 1. The application addresses only one of the eligible project groups, as indicated on the Application Form.
 | [ ]  Pass [ ]  Fail |
| 1. If the applicant has submitted more than one application for the same project group, each application is for a distinct project (i.e., no overlap with respect to the tasks described in the Scope of Work, Attachment 6).

*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 for demonstration sites and match share funds.
 | [ ]  Pass [ ]  Fail |
| 1. *If the project involves technology demonstration/ deployment activities* **(Group 1 only)***:*
* The Application identifies one or more demonstration/ deployment site locations.
* All demonstration/ deployment sites are located in a California electric IOU service territory (PG&E, SDG&E, or SCE).
* The proposal includes a site commitment letter (Section III.C.[~~12~~]) for each demonstration/ deployment site.
 | [ ]  Pass [ ]  Fail |

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## 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 6−7, 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 3) 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. |

**Scoring CRITERIA**

**[~~The following scoring criteria is for Groups 1 and 2~~.] Note: Criterion 9 only applies to Group 1.**

**Additional Screening Criteria for Past Performance**

| **Screening Criteria** |  |
| --- | --- |
| **Applicant Past Performance with Energy Commission**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 Energy Commission (e.g., contract, grant, or loan) and entered into an agreement(s) with the Commission 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; and
* Severe unresolved negative audit findings.
 |  |
| **Must pass to continue with Scoring Criteria** | **Pass/Fail** |

 **Scoring CRITERIA**

**The Project Narrative (Attachment 3)** must respond to each criterion below. The responses must directly relate to the solicitation requirements and focus as stated in the solicitation. 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 [~~11~~] **13**), to the extent that the references apply to the proposed project.

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

**In addition, estimates the non-energy benefits including:** * greenhouse gas emission reductions, air emission reductions (e.g., oxides of nitrogen), water savings and cost reduction, and/or increased safety.
1. States the timeframe, assumptions with sources, and calculations for the estimated benefits, and explains their reasonableness. Include baseline or “business as usual” over timeframe.
2. Explains the path-to-market strategy including near-term (i.e. initial target markets), mid-term, and long-term markets for the technology, size and penetration or deployment rates, and underlying assumptions.
3. Identifies the expected financial performance (e.g. payback period, ROI) of the demonstration at scale.
4. Identifies the specific programs the technology intends to leverage. *(e.g., feed-in tariffs, IOU rebates, demand response, storage procurement) and extent to which technology meets program requirements.*
 | **20** |
| 1. **Team Qualifications, Capabilities, and Resources**

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

|  |  |
| --- | --- |
| **Percentage of CEC funds spent in CA vs Total CEC funds requested**(derived from budget Attachment 7) | **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:$$\frac{Total Direct Labor}{Total Direct Labor + Total Fringe + Total Indirect + Total Profit}$$This ratio will then be multiplied by the maximum possible points for this criterion and rounded to two decimal places.NOTE: For the purposes of this criterion, the CEC will include the facility charges (e.g., rent, utilities, etc.), burdens and other like costs that are budgeted as direct costs into the indirect costs in the formula. | **5** |
| **Total Possible Points****(Minimum Passing Score for Criteria 1 – 7 is 70% or 70.00)** | **100** |
| 1. **~~[Benefits to Disadvantaged/Low-Income Communities and Localized Health Impacts (Group 1 only)~~]**
 |  |
| **~~[Disadvantaged & Low-Income Communities~~** ~~The project benefits the disadvantaged and/or low-income community to receive additional points.~~ 1. ~~Proposal identifies how the target market(s) will benefit disadvantaged and/or low-income communities.~~
2. ~~Identifies economic impact on low-income and disadvantaged communities including customer bill savings, job creation, partnering and contracting with micro- and small-businesses, and economic development.~~
3. ~~Describes how the project will increase access to clean energy or sustainability technologies within disadvantaged or low-income communities and how the development will benefit the communities.~~
	1. ~~Applicants have letters of support from technology partners, community-based organizations, environmental justice organizations, or other partners that demonstrate equity, feasibility, and commercial viability in low-income and disadvantaged communities.~~]
 | [~~5~~] |
| **[~~Total Possible Points for criteria 8~~** **~~(Minimum Passing Score for Criteria 8 is 70% or 35.00 points)~~]** | **[~~5~~]** |
| **[Total Possible Points]** | **[~~105~~]** |
| **Preference Points** Applications must meet all minimum passing scores (Scoring Criteria 1-4[,] **and** 1-7 [~~and 1-8 (Group 1 only)~~)] to be eligible for the additional points. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **8. [~~9.~~] Match Funds** 1. Cash match share is preferred; however, in-kind cost share is permitted and will be considered for solicitation match requirements. Points for this criterion will be evaluated based on the proposed cash match relative to the total match (cash + in-kind) contributions using the Cash Match Scoring Table:

**Cash Match Scoring Table**

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

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

**Exceeds Minimum** **Match Scoring Table**

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

  | **5** |
| 1. **Disadvantaged & Low-Income Communities (Group 1 only)**

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

1. Del Monaco, J. 2022. Responsible Approach To Decarbonization in An Existing Building, ASHRAE Engineer’s Notebook [↑](#footnote-ref-2)
2. Kenney, Michael, et al. 2021. *California Building Decarbonization Assessment*. California Energy Commission. Publication Number: CEC-400-2021-006-CMF. [↑](#footnote-ref-3)
3. Del Monaco, J. 2022. Responsible Approach To Decarbonization in An Existing Building, ASHRAE Engineer’s Notebook [↑](#footnote-ref-4)
4. **Kenney, Michael, et al. 2021, *California Building Decarbonization Assessment*. California Energy Commission. Publication Number: CEC-400-2021-006-CMF** [↑](#footnote-ref-5)
5. High efficiency is a unit with a COP greater than 3. [↑](#footnote-ref-6)
6. For the purpose of this solicitation, low GWP is a refrigerant with a GWP of 10 or less. [↑](#footnote-ref-7)
7. Pacific Standard Time or Pacific Daylight Time, whichever is being observed. [↑](#footnote-ref-8)
8. This deadline does not apply to non-technical questions (e.g., questions concerning application format requirements or attachment instructions) or to questions that address an ambiguity, conflict, discrepancy, omission, or other error in the solicitation. Such questions may be submitted to the Commission Agreement Officer listed in Section G at any time prior to the application deadline. Please see Section G for additional information. [↑](#footnote-ref-9)
9. See CPUC “Phase 1” Decision 11-12-035, December 15, 2011, http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/156050.PDF. [↑](#footnote-ref-10)
10. See CPUC “Phase 2” Decision 12-05-037, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/167664.PDF. [↑](#footnote-ref-11)
11. California Public Resources Code, Section 25711.5(a), http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=25001-26000&file=25710-25712. [↑](#footnote-ref-12)
12. 2012-14 EPIC Triennial Investment Plan, http://www.energy.ca.gov/research/epic/documents/final\_documents\_submitted\_to\_CPUC/2012-11-01\_EPIC\_Application\_to\_CPUC.pdf (Attachment 1), as modified and approved by CPUC Decision 13-11-025, <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M081/K773/81773445.PDF> . [↑](#footnote-ref-13)
13. 2015-17 EPIC Triennial Investment Plan, http://www.energy.ca.gov/2014publications/CEC-500-2014-038/CEC-500-2014-038-CMF.pdf, as modified and approved by CPUC Decision 15-04-020, <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M151/K183/151183650.PDF> . [↑](#footnote-ref-14)
14. AB 758 (Statutes of 2009, chapter 470) [↑](#footnote-ref-15)
15. SB 350 (Statutes of 2015, chapter 547 [↑](#footnote-ref-16)
16. PIR-19-016 with Mazzetti, Inc., entitled “The Decarbonizing Healthcare Guidebook: A Living Resource for Emerging Energy Efficiency Equipment and System.” [↑](#footnote-ref-17)
17. <https://www.energy.ca.gov/publications/2021/low-cost-large-diameter-shallow-ground-loops-ground-coupled-heat-pumps> [↑](#footnote-ref-18)
18. <https://www.energy.ca.gov/publications/2021/development-and-testing-next-generation-residential-space-conditioning-system> [↑](#footnote-ref-19)
19. <https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2021-028.pdf> [↑](#footnote-ref-20)
20. https://www.smartenergydecisions.com/energy-management/2017/05/09/stanfords-4th-generation-district-energy-system [↑](#footnote-ref-21)
21. Nadel, Steven and Christopher Perry. 2020. Electrifying Space Heating in Existing Commercial Buildings: Opportunities and Challenges. American Council for an Energy-Efficient Economy. aceee.org/research-report/b2004. [↑](#footnote-ref-22)
22. Glassley William, Adam Asquith, Tucker Lance, and Elise Brown. 2012. Assessment of California’s Low Temperature Geothermal Resources: Geothermal Heat Pump Efficiencies by Region. California Energy Commission. Publication Number: CEC-500-2014-060. https://cgec.ucdavis.edu/wp-content/uploads/CEC-500-2014-060.pdf. [↑](#footnote-ref-23)
23. https://www.energy.ca.gov/event/workshop/2021-06/electric-program-investment-charge-2021-2025-investment-plan-scoping-1 [↑](#footnote-ref-24)
24. A local publicly owned electric utility is an entity as defined in California Public Utilities Code section 224.3. [↑](#footnote-ref-25)
25. Public Resources Code § 25711.6. [↑](#footnote-ref-26)
26. Public Resources Code § 25711.5. [↑](#footnote-ref-27)
27. Public Resources Code § 25711.6. [↑](#footnote-ref-28)
28. See CPUC “Phase 2” Decision 12-05-037 at pp. 39-40 and 90, http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/167664.PDF. [↑](#footnote-ref-29)
29. **CPUC Decision 21-11-028, Appendix A https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M425/K515/425515575.PDF (revising former guiding principles within CPUC “Phase 2” Decision 12-05-037, Ordering Paragraph 2 http://docs.cpuc.ca.gov/PublishedDocs/WORD\_PDF/FINAL\_DECISION/167664.PDF.).** [↑](#footnote-ref-30)
30. “Key personnel” are individuals that are critical to the project due to their experience, knowledge, and/or capabilities. [↑](#footnote-ref-31)