**GFO-22-501**

**Advancing Window Retrofits and Reducing Fireplace Air Leaks to Increase Existing Building Energy Efficiency**

**Addendum 1**

**November 10, 2022**

The purpose of this addendum is to notify potential applicants of changes that have been made to GFO-22-501. The addendum includes the following revisions to the Solicitation Manual.

Note: Added language appears in **bold underlined** font. Deleted language appears in ~~strikethrough~~ within brackets.

**Please note: A second round of Q&A is available, and the deadline for submission of written questions is November 14, 2022, 5:00 pm.**

## **Solicitation Manual**

1. **Page 1, Section I.A PURPOSE OF SOLICITATION**

Updated:

**Attachments**

| Attachment Number | Title of Section |
| --- | --- |
| 1 | Application Form ***(requires signature)*** |
| 2 | Executive Summary |
| 3 | Project Narrative |
| 4 | Project Team |
| 5 | Scope of Work |
| 6 | Project Schedule |
| 7 | Budget |
| 8 | CEQA Compliance Form |
| 9 | References and Work Product |
| 10 | Commitment and Support Letters ***(require signature)*** |
| 11 | Project Performance Metrics |
| 12 | Applicant Declaration ***(require signature)*** |
| 13 | California Based Entity (CBE) Form |
| 14 | References for Calculating Energy End-Use and GHG Emissions |
| 15 | Contact List ***(not required for application)*** |
| 16 | **Special Terms and Conditions for California Native American Tribes** |

1. **Page 3, Section I.A PURPOSE OF SOLICITATION, Group 1**

Updated:

* 1. Demonstrate increased energy performance (e.g., higher energy efficiency) **according to the research goals listed in Table 1 and decreased HVAC energy consumption** by at least 1**5**[~~0~~]% **when** compared to current **HVAC energy use with existing single pane windows**[~~code standards~~];

1. **Page 5, Section I.B. KEY WORDS/TERMS**

Updated:

|  |  |
| --- | --- |
| Word/Term | Definition |
| **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** [~~or Tribal Communities~~ ~~(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. |

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| Commercial Buildings | As defined in this GFO, [~~C~~]commercial buildings with at least 50,000 square feet and [~~at least 30%~~]have a window to wall ratio between 25% and 30% inclusive. |

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| Disadvantaged Community | These are communities that represent the 25% highest scoring census tracts in CalEnviroScreen 4.0[[1]](#footnote-2), 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. [~~in the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations.~~  ~~(https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40)~~] (<https://oehha.ca.gov/calenviroscreen/sb535>) |
| Gas IOU | Gas Investor-Owned Utility, including Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Gas Co. |
| 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~~]**at or below the threshold designated as low-income** by the **California** Department of Housing and Community Development.  ([**https://www.hcd.ca.gov/grants-and-funding/income-limits/state-and-federal-income-rent-and-loan-value-limits**](https://www.hcd.ca.gov/grants-and-funding/income-limits/state-and-federal-income-rent-and-loan-value-limits)**)** [~~https://www.hcd.ca.gov/grants-funding/income-limits/state-and-federal-income-limits.shtml)~~] |

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| Word/Term | Definition |
| **Secondary Windows** | **Retrofit products that are installed over existing windows and add layers of glazing or insulation without the need for full window replacement.** |

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| --- | --- |
| Total Installed Price Premium | The additional amount for purchasing and installing high- performance windows compared to standard double pane windows. |

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| [~~Under-resourced community~~] | [~~A broader term that includes disadvantaged, low-income, and tribal communities in California.~~] |

1. **Page 8, Section 1.C.1. Project Focus. Group 1: High-Performance Window Retrofits for Commercial Buildings.**

Updated:

1. **Group 1: High-Performance Window Retrofits for Commercial Buildings**

This research focuses on advancing building window efficiency and strives to achieve a performance approaching that of a wall. Projects under this research category must be ready to demonstrate and deploy in commercial buildings and be at a technology readiness level[[2]](#footnote-3) (TRL) of 7 or 8 at the start of the research. The objective of this group is to raise the TRL by at least one level and develop window technologies that have potential for widespread adoption. The objectives are to: a) advance high-performance window technologies by addressing retrofit technical and cost challenges; b) demonstrate increased energy performance **according to the research goals listed in Table 1 and decreased HVAC energy consumption** by at least 1**5%**[~~0%~~] **when** compared to current **HVAC** **energy use with existing single pane windows** [~~code standards~~]; c) reduce installation costs compared to code compliant windows; and d) accelerate high-performance window uptake in the retrofit market through direct partnerships with manufacturers, suppliers, and others.

Projects in this group must meet **all** of the following requirements during the research agreement period, and these must be included in the Scope of Work (Attachment 5):

i. Performance and Metrics

* Have the **potential to meet the performance goals** listed in Table 1**.** [~~or provide justification for an alternate goal that will exceed baseline requirements as described later in this section under the Project Narrative, Technical Approach.~~]
* Independently field test and demonstrate lower heating and cooling building energy consumption compared to Title 24 compliant windows for a period of 12 months that includes the summer and winter seasons.
* Independently field test and demonstrate lower cost of implementation compared to current practices.
* Be easily deployable, with comparable thickness and weight to the currently installed window base and an installation time that is similar to or less than current practices.
* Lab test to compare the performance of Title 24 compliant windows and the proposed window technology prior to field installation to verify that the energy performance goals listed in Section I.A. and Table 1 can be met.
* Model performance of standard Title 24 compliant and the advanced windows in all climate zones using CBECC 2022 modeling software **for the same demonstration site building**.

1. **Page 9, Section 1.C.1.** **Project Focus.** **Group 1: High-Performance Window Retrofits for Commercial Buildings.**

Updated:

ii. Location and sample size

* The retrofit must occur in a **single commercial building or group of commercial buildings** totaling at least 50,000 square feet **with a window to wall ratio** **between 25% and 30%, inclusive. The ratio must remain the same before and after the retrofit.** Targeted buildings could include school campuses, retail centers, and office buildings[~~with at least 30% window to wall ratio~~]. Verification documentation of window to wall ratio**,** [~~and~~] total building construction floor area**,** **and potential for** **decreased HVAC energy consumption by at least 15% when compared to current HVAC energy use with existing single pane windows** must be included in the proposal.
* The demonstration must retrofit at a minimum 5,000 square feet of single pane windows with high-performing windows.
* All demonstration sites must be located in a Gas IOU service territory (Pacific Gas and Electric Co., San Diego Gas and Electric Co., and/or Southern California Gas Co.).
* Demonstration projects must occur in buildings and climate zones with the highest potential for adoption of the high-performance windows if the performance criteria in Section I.A. and Table 1 are met. This can include cost effectiveness based on high heat and/or extreme cold days such as in climate zones 1, 11, 12, 13,14, 15, and 16; long operating hours; or other circumstances that make them prime retrofit candidates.

iii. Cost reduction

* Evaluate and estimate the system cost (materials and installation per **square foot of** window).
* Take actions to reduce the window costs and increase efficiency, such as keeping assembly thickness comparable to existing windows for retrofit applications. improved spacers that have positive impact on U-factor; and improved frame assemblies that maintain long-term air filtration and structural requirements.
* Provide the cost effectiveness of each action by building type (e.g., schools, offices, retail, etc.).

iv. Market Deployment

* Provide a market deployment plan that will increase installation and market share of high-performance windows if the requirements in Table 1 are met, including, but not limited to:
  + Strategies for obtaining a manufacturing partner(s);
  + Strategies for scaling up manufacturing and scaling up deployment of the window technology;
  + Compare current Title 24 compliant window cost to the high-performance new window costs, to include materials and installation per window cost and strategies for cost reductions;
  + Overall analysis of cost effectiveness including payback by building type (e.g., school, office, retail, etc.);
  + Analysis to estimate market size and identify most promising market, including all assumptions; and
  + Strategies for increasing installation and market shares of the window technology in commercial buildings with the most potential for retrofit.
* **Energy Efficient Statewide measure development component**
  + **This effort is intended to streamline potential energy efficiency measure development for inclusion in California’s energy efficiency portfolios.**
  + **CAM will direct when to commence the process.**
  + **This includes but is not limited to:**
    - **consultation with** [**California Technical Forum (Cal TF)**](http://www.caltf.org/)**[[3]](#footnote-4);**
    - **data collection consistent with the needs of measure development; and**
    - **completing Cal TF’s** [**Measure Proposal Form**](http://www.caltf.org/s/CalTF-Measure-Proposal-Form-v10.xlsm)**[[4]](#footnote-5) when directed by the CAM.**
    - **Submission of a completed measure application packet is not required.**

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

* Discuss how the project will meet or exceed the requirements identified in Section I.C.1. of the solicitation manual, including sections i through iv (i.e., performance, location and sample size, cost reduction, and market deployment in the Scope of Work). Each sub-section of the narrative **must clearly describe and label** which of the areas identified in I.C.1 and Scope of Work they are meant to address.
  + Provide analysis on how the selected technology may meet or exceed the criteria listed in Table 1 and summarize the information in Table 2. [~~If the target performance for the selected technology is different than those listed in Table 1, provide: a) reason for the difference in performance, b) explain how it will still exceed current building energy efficiency standards, c) how it will increase deployments in the retrofit market, d) how it will benefit California Gas IOU ratepayers, such as GHG reductions and energy and cost savings, and e) provide all assumptions used to justify the high-performance window.~~]
* Estimate and discuss how window system costs (capital and/or installation) will be reduced compared to current Title 24 compliant technology. Identify specific measures that facilitate system cost reduction, such as framing thickness, improved spacers, and more durable frame assemblies. If proposed window technology will concurrently test with Title 24 compliant windows in a side-by-side approach, use Title 24 technology installation values.
* **This item only pertains to applicants with demonstration sites who already have plans and budget to install Title 24 compliant windows and are willing to do side-by-side field testing to compare with the new high-performance window technology.** Side-by-side means that windows must be evaluated under the same environmental conditions, such as same building orientation and location, and be installed in buildings of similar vintage with respect to energy using systems, envelope and occupant usage patterns. Examples of side-by-side installations include, windows that are all south facing, windows on one floor will be the Title 24 compliant windows and another floor will have the high-performance windows. Side-by-side approaches will be considered an enhancing feature during the scoring of the technical approach. If proposing to do the side-by-side comparison, applicants must:
  + install at least 2,500 square feet of Title 24 compliant windows.
  + collect M&V data for both windows under the same environmental conditions for the purpose of identifying differences in window performance, installation practices, and cost and energy savings.
  + Include the following in the project narrative:
    - * 1. Description of demonstration site and the building where the Title 24 compliant and high-performance windows will be installed. Include the building orientation, building vintage, major energy using systems and occupancy patterns,
        2. Source of funding for the purchase and installation of the 2,500 square foot of Title 24 compliant windows since the purchase and installation cost cannot be paid for with Gas R&D funds,
        3. Source of contingency funding in the event of cost overruns and supply chain issues associated with the purchase and installation of the Title 24 compliant windows, and
        4. Copies of construction, design drawings or other documentation to provide evidence or commitment that the applicant has already planned to retrofit at least 2,500 square feet of replacement windows with Title 24 compliant windows.

Title 24 compliant window square footage does not count towards the 5,000 square feet requirement of proposed window technology. Costs for the Title 24 compliant windows and installation will count as match if it meets the requirements in Section I.J. This item **does not apply** to demonstration sites that **have not planned nor budgeted** for a retrofit of their existing windows with Title 24 compliant windows **prior to submitting the application**. **However, prior completed window retrofits that meet 2022 Title 24 compliant standards can be considered to have an enhanced feature but cannot be counted as match.**

### **Page 12, Section 1.C1. Project Focus**

Updated:

Table 1: Summary of Metrics for Group 1[[5]](#footnote-6)

|  |  |  |  |
| --- | --- | --- | --- |
| **Technology** | **Baseline** | **Research Goal** | **Research Goal  Secondary window technology only** |
| **Commercial Windows Performance** | [~~\*~~]Performance:  U-Factor **≤** **0.34**  **(R-2.9)** [~~0.2 to 0.14~~  ~~(R-5 to R-7)~~] | U-Factor ≤ 0.13 (R ~7.7)  [~~V~~~~T~~ ~~>0.42~~]  [~~SHGC ≤ 0.20~~] | **U-Factor ≤ 0.22  (R ~4.5)** |
| **Installation [~~Ease~~] and Cost of Implementation** | **Price of** [~~S]~~**s**tandard double-pane window **and** install**ation** [~~time and cost~~] | [~~The installation time and cost of new technology are the same or less than those for double-pane windows.~~]  [~~Cost premium ≤~~ ~~$5~~]  \***Total installed** **price**  **≤ $6**/sq. ft. | \***Total installed** **price** **premium**  **≤ $5/sq. ft.** |

[~~\*Baseline performance metrics based on Gupta, Smita, Jeremy Smith. Itron, Inc. 2019.~~ *~~Research Gap Analysis for Zero-net Energy Buildings.~~* ~~California Energy Commission. Publication Number: CEC-500-2019-031-AP.~~ ]

**\*Total Installed Price Premium is the increased cost of the advanced window product purchase and product installation versus the cost for purchasing and installing standard double pane windows.**

### **Page 15, Section 1.D. Funding**

Updated:

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

There is **up to $2,638,222** available for grants awarded under this solicitation. The total, minimum, and maximum funding amounts for each project group are listed below.

| Project Group | Available funding | Minimum award amount | Maximum award amount | Minimum match funding  (% of Gas R&D Funds Requested) |
| --- | --- | --- | --- | --- |
| Group 1: High-Performance Window Retrofits for Commercial Buildings | $2,400,000 | $1,200,000 | $2,400,000 | 20% match required but match requirement is waived for demonstrations in and benefiting **disadvantaged/low-income** **communities** **and/or Tribes**[~~under-resourced communities~~]. |
| Group 2: Strategies to Reduce Fireplace Air Leaks in Residential Buildings | $238,222 | $200,000 | $238,222 | No match required, but those with match will receive preference points. |

1. **Match Funding Requirement**

Match funding for **Group 1** is required in the amount of at least **20%** of the requested project funds. If the demonstration is in a[~~n under-resourced community~~] **disadvantaged/low-income** **community** **and/or Tribe** and demonstrates how the project will benefit the community, the match requirement is waived.

### **Page 16, Section 1.E. Key Activities Schedule**

Updated:

|  |  |  |
| --- | --- | --- |
| ACTIVITY | DATE | TIME[[6]](#footnote-7) |
| Solicitation Release | **September 20, 2022** |  |
| Pre-Application Workshop | **October 11, 2022** | **10:00 a.m.** |
| Deadline for Written Questions[[7]](#footnote-8) | **October 21, 2022** | **5:00 p.m.** |
| Anticipated Distribution of Questions and Answers | Week of [~~November 4~~] **November 7**, **2022** |  |
| Deadline for Second Round of Written Questions | **November 14, 2022** | **5:00 p.m.** |
| Anticipated Distribution of Second Round Questions and Answers | **Week of November 28, 2022** |  |
| Deadline to Submit Applications | **[~~November 29~~] December 9, 2022** | **11:59 p.m.** |
| Anticipated Notice of Proposed Award Posting Date | February 3, 2023 |  |
| Anticipated Energy Commission Business Meeting Date | May 10, 2023 |  |
| Anticipated Agreement Start Date | May 29, 2023 |  |
| Anticipated Agreement End Date | March 31, 2027 |  |

### **Page 26, Section II.B. Terms and Conditions**

Updated:

## **Terms and Conditions**

Each grant agreement resulting from this solicitation will include terms and conditions that set forth the recipient’s rights and responsibilities. By signing the Application Form (Attachment 1), each applicant agrees to enter into an agreement with the CEC to conduct the proposed project according to the terms and conditions that correspond to its organization, without negotiation: (1) University of California and California State University terms and conditions; (2) U.S. Department of Energy terms and conditions; [~~or~~] (3) **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 Gas R&D Program 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.**

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

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

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

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

1. **Page 27, Section II.D.** **Disadvantaged & Low-income Communities**

Updated

## **D. Disadvantaged/ [~~&~~] Low-income Communities and/or Tribe(s)**

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

The California Energy Commission is committed to ensuring all Californians have an opportunity to participate in and benefit from programs and services. While it is not required to complete the project within a disadvantaged community, demonstration projects located and benefiting disadvantaged and/or low-income communities **and/or Tribe(s)** will be [~~considered~~] **eligible for preference points** under the scoring criteria for this GFO.

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

1. **Page 38, Section IV.E. Stage one: Application Screening**

Updated

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| --- | --- |
| 1. *Group 1 only. If project site is not located in a[~~n under-resourced community~~]* **disadvantaged/low-income community and/or Tribe,** the Application includes Commitment Letters that total the minimum of 20*%* in match share of the total requested CEC funds. | Pass  Fail |

## **Page 46,** **Section IV.F. Stage Two: Application Scoring**

Updated

|  |  |
| --- | --- |
| 1. [~~Under-Resourced Communities~~]**Disadvantaged/Low-Income Communities and/or Tribes**   In order to receive or qualify for additional points, the proposed project must be located in and demonstrate benefits to the **disadvantaged/low-income community(ies) and/or Tribe(s)**[~~under-resourced communities~~ ~~in order to receive additional points~~].   1. Proposal identifies how the target market(s) will benefit **disadvantaged/low-income community(ies) and/or Tribes**[~~under-resourced~~ ~~communities~~]. 2. Identifies economic impact on **disadvantaged/low-income community(ies) and/or Tribes**[~~under-resourced 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/low-income community(ies) and/or Tribes**[~~under-resourced communities~~] and how the development will benefit the communities. 4. Applicants have letters of support from technology partners, community- based organizations, environmental justice organizations, or other partners that demonstrate their belief that the proposed project will lead to increased equity, and is both feasible, and commercially viable in the identified **disadvantaged/low-income community(ies) and/or Tribes[**~~under-resourced~~ ~~communities~~]. | **5** |

**Angela Hockaday,**

**Commission Agreement Officer**

1. **Note that the SB535’s CalEnviroScreen mapping tool undergoes updates, and the latest version can be found on OEHHA’s website: https://oehha.ca.gov/calenviroscreen.** [↑](#footnote-ref-2)
2. U.S. Department of Energy, “Technology Readiness Assessment Guide”. <https://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf> [↑](#footnote-ref-3)
3. **California Technical Forum website:** [**http://www.caltf.org/**](http://www.caltf.org/) [↑](#footnote-ref-4)
4. **California Technical Form Measure Proposal Form link:** [**http://www.caltf.org/s/CalTF-Measure-Proposal-Form-v10.xlsm**](http://www.caltf.org/s/CalTF-Measure-Proposal-Form-v10.xlsm) [↑](#footnote-ref-5)
5. Performance goals are for the window as a whole. [↑](#footnote-ref-6)
6. Pacific Standard Time or Pacific Daylight Time, whichever is being observed. [↑](#footnote-ref-7)
7. 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-8)