

**Questions and Answers**  
**GFO-23-302**  
**Power Electronics for Zero-Emission Residential Resilience**  
**(PEZERR)**

**January 12, 2024**

The following answers are based on California Energy Commission (CEC) staff's interpretation of the questions received. It is the Applicant's responsibility to review the purpose of the solicitation and to determine whether or not their proposed project is eligible for funding by reviewing the Eligibility Requirements within the solicitation. The CEC cannot give advice as to whether or not a particular project is eligible for funding, because not all proposal details are known.

**Project, Siting, and Match Requirements**

**Q1: Are off-grid deployments relevant to the Grant Funding Opportunity (GFO)?**

A1: No, this solicitation language explicitly seeks to integrate distributed generation on the electric grid in a manner that enables energy resiliency. This grant award is from the investor-owned utilities' (IOU) ratepayer-funded Electric Program Investment Charge (EPIC) Program, so demonstrations must benefit IOU ratepayers.

**Q2: If a partnership is formed, are there requirements for the role or percentage responsible from each of the partners?**

A2: Each proposal must describe the project team and identify the roles and responsibilities of all project partners. This information may be updated between the Phase 1 abstract and the Phase 2 full application. Community-Based Organizations (CBOs) must be part of the project and identified by Phase 2. Under Part II, Section B.4. of the solicitation manual, "the project must allocate appropriate funding for CBO engagement for relevant tasks under the scope of work." Each applicant should determine, and justify in the application, the appropriate funding for CBO engagement.

**Q3: For [analyzing the financial benefits of the system], do benefits on load reduction count (i.e., savings to tenants/residents)? Or is it just hard costs of installation?**

A3: Projects are expected to conduct a full financial benefit analysis of the system, then break down this analysis to identify individual components (e.g., energy savings, reduced installation costs, monetizing grid services performed). Within the Technology Comparison Matrix of Attachment A "Project Abstract Summary" for the Phase 1 submission, applicants will compare the estimated installed costs of the proposed technology to current leading technologies.

**Q4: [The technology requirements] seem very single-family [housing] oriented, but multi-family [housing makes up] 45% of California residences. What bonus points or other considerations are given for multi-family solutions?**

A4: Bonus points are listed under Criteria 9 (Match fund) and 10 (Wildfire Criteria). There are no additional bonus points given for multi-family housing deployments, but such demonstrations are allowed and encouraged under this solicitation. Applications should include descriptions of the scalability and anticipated benefits of the technology, including assumptions and justification.

**Q5: Do the community-based support orgs need to be based in the High Fire Threat Districts (HFTDs)? Or can they be in communities that will be especially relevant and targeted for the commercial scale-up phase?**

A5: Demonstrations within High Fire Threat Districts (HFTDs) are eligible for bonus points depending on the proportion of demonstrations within these communities. Projects must involve CBOs that are relevant to the demonstration site location(s). Applicants are welcome to include additional CBOs beyond the community of demonstration to support further commercial scale-up and rollout of the emerging technology.

**Q6: Does the entity itself need to be located within a disadvantaged community, tribal community, etc., or can the company provide specific and significant financial and other benefits to a specific Disadvantaged Community in California?**

A6: The latter -- there is no requirement that the primary applicant must be located within a Disadvantaged Community, California Native American Tribe (Tribe), or low-income community. The technology demonstration must be located in such a community, and strong applications will at least include project partners located in these communities (e.g., CBOs). Applicants are expected to finalize their project demonstration locations by the Phase 2 full application submission.

**Q7: Do 100% of sites need to be in low-income and Disadvantaged Communities during the grant demo phase, or can additional sites be noted that would be funded by the applicant, even if they are not formally counted as part of the CEC reimbursable or match budget (and would be in excess of the minimum deployment requirement under this GFO)?**

A7: The solicitation language requires that the EPIC funds must only support demonstrations within low-income communities, Disadvantaged Community, and/or Tribes. Additional demonstrations beyond these areas may be covered by match funds.

**Q8: To confirm, 100% of the HFTDs ALSO need to be Low-income/ Disadvantaged Communities. There is no mix/match whereby a non-Low income/Disadvantaged Community HFTD community would be eligible?**

A8: The solicitation language requires that HFTD deployment must also meet the minimum site requirements of being in a low-income community, Disadvantaged Community, or Tribe.

**Q9: In the "Recommendations for Research Design and Methodology," bullet 6 mentions "Demonstrations are on existing residential units...with an existing main electrical panel size of 100 amps or less." Does this 100A panel requirement apply to all demonstration sites, or would a set of demonstration sites that includes a mix of existing panels above and below 100A be acceptable?**

A9: These are general research design recommendations, not inherent minimum project requirements. Projects that include a portion of the technology demonstration with 100A electrical panels are encouraged.

**Q10: Since CEC is managing the Inflation Reduction Act 50121 and 50122 grants but are federally funded, can those be used for match?**

A10: No, other CEC awards will not qualify as a valid match source, even if the funds originate from a federal rebate program. Federal funds received directly from another entity, such as the U.S. Department of Energy, may be leveraged as match funds as long as the funds are spent during the agreement term on activities related to the project's scope. The funds must also be secured at the time the proposal is submitted, and appropriate commitment letters must be included in the Phase 2 full application submission.

**Q11: If a solution is concurrently being tested in similar circumstances in the development of a technology but in another state, can data be added in the analysis of the technology benefits gathered in the solicitation that could add to the validity of the analysis? And could data gathered in this method, supported by another grant program, be considered as a match funding source?**

A11: Yes, performance data on the technology gathered external or prior to the project may be used to supplement data gathered within this project's scope. Data gathering activities external to the project may be considered as match if this task was conducted during the agreement term and the data collected supports the project activities. However, only activities that directly support the proposed project and are included as part of the tasks in the Scope of Work may qualify as match.

**Q12: Are you allowed to submit multiple abstracts in Phase 1?**

A12: Solicitation language states that "applicants may submit multiple applications, though each application must be for a distinct project (i.e., no overlap with respect to the tasks described in the Scope of Work)." (Page 2, Part I. Section A.)

**Q13: Are Community Choice Aggregators (CCAs) eligible to apply?**

A13: This solicitation is open to all public and private entities with the exception of local publicly-owned electric utilities. In accordance with California Public Utilities Commission (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. All demonstration sites must be located within IOU territory and benefit IOU ratepayers.

## Technical Questions

**Q14: In the "Minimum Requirements for System Design", bullet 3 mentions "ensuring continuous power to critical loads." Would a rapid transfer of a load from the grid to a backup system within a few seconds (as would be seen with an automated transfer switch) be considered "continuous"?**

A14: For the purposes of this solicitation, an automatic transfer switch would be considered as sufficient for serving "continuous" power to critical loads. This has been clarified in Addendum 1 of the GFO, where "continuous" may allow for a brief power interruption of a few seconds due to an unplanned outage.

**Q15: In the "Minimum Requirements for System Design," bullet 3 mentions CPUC Rule 21, and bullet 8 requires compliance with all codes and standards. Does this include permitting for Rule 21 Interconnection? If so, are applicants expected to independently initiate the Rule 21 permitting process, or is this something that CEC will help facilitate for applicants/recipients?**

A15: Funded projects are expected to apply and obtain approval for Rule 21 interconnection during the agreement term with adequate time for subsequent monitoring and verification. The recipient is responsible for coordinating and applying for all permits, including Rule 21 Interconnection approval. This expectation has been clarified in Addendum 1 of the GFO.

**Q16: Does [the page 7 Minimum Requirement for complying with "all codes, UL certifications"] mean that UL Listing must be obtained, or can the system be site certified? If UL Listing is required, would it require UL 1741 SB, or would UL 1741 SA be acceptable? Can certification cost be included in the project cost?**

A16: Rule 21 interconnection requires UL 1741-SB certification. Equipment deployed may be site-certified at minimum; proposals that pursue this route should consider the timeline and costs for site certification and incorporate this into the project schedule and budget. Costs associated with obtaining UL certification are allowable project costs. Refer to the solicitation manual and applicable Terms and Conditions regarding whether permitting and interconnection fees are allowable for reimbursement.

**Q17: In the "Minimum Requirements for System Design," bullet 7 mentions "Must have interoperability to enable communication between the customer's system and the grid." Are there specific communication standards and/or protocols that the CEC is looking for? If so, could this list of desired standards and/or protocols be provided by the CEC?**

A17: Communications must meet the requirements of Rule 21, so they should be consistent with UL 1741-SB's interoperability requirements and comply with either IEEE 2030.5 or SunSpec Modbus protocol. This clarification has been made in Addendum 1 of the GFO.

**Q18: Complying with Rule 21 will require certification to 1741-SB? The difference between plain UL 1741 and the latest version, -SB, is about \$150,000 in extra testing, about nine months of testing at an accredited Nationally Recognized Testing Laboratory, and there is a backlog. This is a major barrier for emerging technologies.**

A18: The CPUC's Rule 21 interconnection proceeding (Rulemaking 17-07-007) is one of the key policy drivers behind this research opportunity. Costs associated with UL testing are an allowable expense for reimbursement; proposals that pursue this route should consider the timeline and costs required to accomplish this task and incorporate this into the project schedule and budget. Addendum 1 for this GFO clarifies that achieving Rule 21 interconnection compliance is a requirement for the awarded technology deployment projects.

**Q19: Are you looking for a unitized solution combining a smart panel and storage option?**

A19: This is an applicable technology within the scope of this funding opportunity. The purpose of this solicitation is to fund the demonstration of emerging power electronics technologies that reduce the time, cost, and complexity of installing and integrating zero-emission backup power systems (e.g., solar and battery systems). Relevant technologies will incorporate a modular design that is replicable and rapidly deployable with minimal alterations between sites.

**Q20: Is installing backup power at ten existing residences a hard requirement for proposed projects under this solicitation?**

A20: This solicitation's research area is specifically focused on integrating backup power at existing residences, but there is no hard requirement for a particular number of deployments – any number of deployments specified by the solicitation manual is a soft recommendation.

Within Part I, Section C (pages 5-7), any requirements listed under the "Minimum Requirements" are considered hard requirements for the technology and project being proposed. Aspects listed under the "Recommendations for Research Design and Methodology" are soft suggestions for how CEC would like to see the research project structured. Elements listed under "Additional Desirable Features" are additional enhancing qualities that CEC would find favorable in a project proposal submitted under this GFO.

For clarity, the minimum project requirements for this grant solicitation from Part I, Section C are reproduced here as follows (additional clarifications from Addendum 1 are **bold and underlined**):

- Projects must be sited in a Low-income or Disadvantaged Community or located within a California Native American Tribal territory (Tribe) since these communities are disproportionately impacted by power outages and stand to benefit the most from clean, affordable backup power solutions.
- Integration of the behind-the-meter backup power system does not trigger a utility service upgrade.

- Backup energy generation source must be zero-emission (onsite/direct emissions). If a storage system is used, this must be charged at off-peak hours if charged from grid power. The size and other specifications of the backup power system should be appropriate for the purpose of validating the research project's conclusions.
- Automatic safe islanding during grid outages and reconnection when grid power resumes, ensuring continuous power to critical loads and preventing backflow onto the grid as defined by CPUC interconnection Rule 21. **Under this solicitation, "continuous" may allow for a brief power interruption of a few seconds due to an unplanned outage. For example, an automatic transfer switch would meet this requirement.**
- Modular design that is replicable and can be rapidly deployed, or "plug-and-play ready," in a variety of residential use cases that require minimal alterations and customizations needed from electricians and other contractors.
- The research project begins at technology readiness level (TRL) 6-8 and advances the TRL of the technology by at least one level.
- Allows the customer to prioritize critical loads for backup.
- Must have interoperability to enable communication between the customer's system and the grid, as well as the various system components; **consistent with Rule 21 interconnection requirements, communications should comply with either IEEE 2030.5 or SunSpec Modbus Protocol.**
- Must comply with all codes, **Rule 21 interconnection requirements**, UL certifications, and other standards such as: California electric code, National Electric Code, local and state fire marshal codes. Must acquire all necessary permits and perform load calculations to ensure system is safely installed.

**Q21: If our solution is a prototype system that is a modular solution consisting of off-the-shelf components, does that constitute TRL 6 and satisfy the threshold requirement of the system being TRL 6-8?**

A21: Technologies must be pre-commercial and have completed a pilot demonstration of the technology prototype in a relevant environment to be at TRL 6. Applicants are expected to describe the technology's maturity and previous pilot demonstrations as part of the technology abstract (see Attachment A) for Phase 1 submissions. Proposals must clearly describe the technological, scientific knowledge advancement, and/or innovation that the project is aiming to accomplish.

The solicitation manual defines "pre-commercial technology" as "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."

**Q22: As a modular manufacturer, we specialize in new construction. Would we be scored negatively for focusing on new construction? Note that we are considering implementing National Renewable Energy Laboratory-developed FISS (Factory-Installed Solar and Storage) techniques.**

A22: New construction projects are out of this solicitation's scope. From the introduction of the solicitation manual: "This solicitation aims to lower the cost and reduce the time to install zero-emission behind-the-meter (BTM) backup power systems in *existing* residential buildings such as homes and multifamily dwellings" (emphasis added).

**Q23: If this is a prototype system that is stitching together through various UL - certified off-the-shelf components, does the system still satisfy, "Must comply with all codes, Underwriters Laboratories (UL) certifications, and other standards?"**

A23: It depends on the prototype system being deployed; applicants must comply with all codes and standards in accordance with Authorities Having Jurisdiction (e.g., city building departments and county fire departments). This solicitation is looking to fund technologies that reduce the need for custom-built solutions from site to site. A modular, packaged product that contains individually UL-certified components may need to obtain new UL certification for the full product to become a commercialized "off-the-shelf" solution. Awarded projects are to demonstrate streamlined technology solutions that enhance cost-efficiency, scalability, and replicability of zero-emission BTM backup power systems at existing residential buildings.

**Q24: How do warranty costs affect the competition matrix?**

A24: Applicants may elect to include or exclude warranty costs within the estimated levelized cost of energy for the full backup power solution as long as this is disclosed within the assumptions and consistent across the three technology categories. If warranty costs vary across the three technology categories, these assumptions should be described and justified.

**Q25: In the competition matrix, for "Time duration that critical loads can be powered", do you provide a benchmark for the critical load? Is it 50% of the overall load?**

A25: The percentage of critical loads to overall load will vary on a case-by-case basis depending on what loads are present. Examples of critical loads include, but are not limited to, refrigeration, emergency lighting, air purifiers, and medical devices. Critical loads will vary greatly depending on the individual circumstances. Applicants are expected to justify their assumptions on critical load capacity and apply them consistently across all three technology categories to maintain level comparisons.