STATE OF CALIFORNIA
GRANT REQUEST FORM (GRF)
CEC-270 (Revised 12/2019) CALIFORNIA ENERGY COMMISSION

A) New Agreement # EPC-20-010 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Felix Villanueva	51	916-327-2206

C) Recipient's Legal Name	Federal ID Number
California Energy Alliance	82-3040711

D) Title of Project
Energy and Appliance Standards for Plug Loads: Assessing Current Needs and Future Opportunities

E) Term and Amount

Start Date	End Date	Amount
3/1/2021	3/31/2024	$ 996,974

F) Business Meeting Information

☐ ARFVTP agreements $75K and under delegated to Executive Director

Proposed Business Meeting Date 2/10/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Felix Villanueva Time Needed: 5 minutes

Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description:
CALIFORNIA ENERGY ALLIANCE. Proposed resolution approving Agreement EPC-20-010 with California Energy Alliance for a $996,974 grant to conduct a study to: 1) evaluate the energy consumption of selected commercial and residential plug load device types, 2) quantify their statewide market size and energy use, and 3) determine potential energy and cost savings if considered for future energy codes and standards, and adopt staff's determination that this action is exempt from CEQA. (EPIC funding) Contact: Felix Villanueva. (Staff Presentation: 5 minutes).

G) California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
   ☒ Yes (skip to question 2)
   ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

   Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:
   a) ☒ Agreement **IS** exempt.
      ☐ Statutory Exemption. List PRC and/or CCR section number:
      ☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14, § 15301
      ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

      Explain reason why Agreement is exempt under the above section: This project involves testing and analyzing the energy usage of different types of commercially available electronic devices such as printers, modems, and computers and

commercial lab equipment like fume hoods and centrifuges. This project is exempt under Cal. Code Regs., tit. 14, §; 15301 because it involves testing and analyzing of electronic devices by existing laboratory facilities at University of California campuses and involves negligible or no expansion of use.

b) Agreement **IS NOT** exempt. (consult with the legal office to determine next steps)

Check all that apply

- ☐ Initial Study
- ☐ Negative Declaration
- ☐ Mitigated Negative Declaration
- ☐ Environmental Impact Report
- ☐ Statement of Overriding Considerations

H) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	**Budget**
The Regents of the University of California, Davis, California Lighting Technology Center	$ 233,257
The Regents of the University of California, Irvine Campus	$ 624,557
The University Corporation, California State University, Northridge	$ 66,000
	$

I) List all key partners: (attach additional sheets as necessary)

Legal Company Name:

J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	19-20	301.001G	$996,974

R&D Program Area: EERO: Buildings TOTAL: $ 996,974

Explanation for “Other” selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient’s Contact Information

1. Recipient’s Administrator/Officer

Name: Gail Russo-Larsson

Address: 836 57Th St Ste 420

City, State, Zip: Sacramento, CA 95819-3327

Phone:

E-Mail: gail.russo-larsson@caenergyalliance.org

2. Recipient’s Project Manager

Name: Josh Dean

Address: 836 57Th St Ste 420

City, State, Zip: Sacramento, CA 95819-3327

Phone: 916)237 -7407

E-Mail:
josh.dean@caenergyalliance.org

L) Selection Process Used

☒ Competitive Solicitation Solicitation #: GFO-20-303

☐ First Come First Served Solicitation Solicitation #:

M) The following items should be attached to this GRF

1.	Exhibit A, Scope of Work		☒ Attached
2.	Exhibit B, Budget Detail		☒ Attached
3.	CEC 105, Questionnaire for Identifying Conflicts		☒ Attached
4.	Recipient Resolution	☒ N/A	☐ Attached
5.	CEQA Documentation	☐ N/A	☒ Attached

_____ _____
Agreement Manager **Date**

_____ _____
Office Manager **Date**

_____ _____
Deputy Director **Date**

Exhibit A
Scope of Work
California Energy Alliance

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Preliminary Market Assessments and Product Selection
3	X	Develop Product Test Procedures
4	X	Product Testing and Analysis
5		Evaluation of Project Benefits
6		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CalPlug	California Plug Load Research Center, UC Irvine
CAM	Commission Agreement Manager
C&S	Codes and Standards
CAO	Commission Agreement Officer
CEA	California Energy Alliance
CEC	California Energy Commission
CPR	Critical Project Review
CTLC	California Lighting Technology Center, UC Davis
TAC	Technical Advisory Committee

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to develop recommendations for near and mid-term appliance energy standards and develop test improvements to reduce energy consumption related to commercial office equipment, laboratory equipment and residential networking equipment, certain types of which, are not currently regulated at the State or Federal level. The Agreement will support activities to develop necessary test procedures, determine energy consumption of these devices, their subsystems and of the devices in various states (e.g., active and standby modes) in order to identify opportunities for substantial, cost-effective energy savings that can be realized through new regulations and appliance standards.

[1] Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

B. Problem/ Solution Statement

Problem

Plug loads are one of the fastest growing categories of energy use in residential and commercial buildings. Plug loads accounted for 40 percent of California residential electricity consumption and 27 percent of California commercial electricity consumption in 2018.[2] With more and more devices being brought into and used in buildings, it is expected that the total energy use for plug loads will continue to increase. Plug load devices are typically not monitored nor controlled. Many of these devices have no power management capabilities and are powered continuously at full output. In addition, many of these plug loads are not regulated at the State or Federal level. Lack of effective, cost-effective appliance standards for these devices contributes to energy waste, greenhouse gas emissions and increased costs for business owners and consumers.

Solution

One of the most effective ways to reduce plug load energy use is through the adoption of device-level appliance energy standards. In order to identify achievable energy savings opportunities, however, research must be completed to develop a market and manufacturing understanding of each unregulated device type, its subsystems, potential and existing operating modes, and its range of energy use and demand. This will lead to new codes and standards opportunities for these plug load devices focused on such things as maximum power ratings, mandatory operational states (e.g. sleep or standby power use) and minimum component-level efficiencies. In addition, future codes and standards will require specification of existing test procedures or development of new test or performance verification procedures to quantify energy use and, in the future, determine code compliance.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this agreement is to identify non-covered plug load devices with the most potential to inform future codes and standards (C&S) for energy efficiency or load management, and develop C&S recommendations and standardized test procedures to quantify their energy use for compliance purposes.

Ratepayer Benefits:[3] This Agreement could result in the ratepayer benefits of lower device costs, greater grid stability, reduced electricity costs and greater electricity reliability by identifying unregulated plug loads that can be included in future California appliance standards. Future standards, if enacted, will reduce plug load energy use, associated GHG emissions, and related costs to businesses and consumers.

Technological Advancement and Breakthroughs:[4] This Agreement could lead to technological advancement and breakthroughs by providing cost-effective opportunities to reduce commercial

[2] Navigant Consulting, Inc. RD&D Opportunities to Reduce Building Plug Load Energy Consumption

[3] California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

and residential plug load energy use and mandate load management features in commercially available products sold in California. This research will also result in new, standardized test procedures to quantify plug load energy use to determine code compliance, as well as estimates of the statewide savings expected due to code change recommendations.

Agreement Objectives

The objectives of this Agreement are to:

- Identify plug load devices with the most potential for cost-effective energy savings achieved through state-level codes and standards development.
- Develop test procedures, when needed, to reliably quantify energy use and related performance attributes for compliance purposes.
- Test selected plug load devices to accurately determine energy consumption in active, standby, sleep, idle and/or other operating modes.
- Analyze test data and extrapolate results to determine specific C&S opportunities
- Model the impact of the C&S recommendations to determine statewide savings and related impacts.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). Products that require a draft version are indicated by marking **"(draft and final)"** after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, **"days"** means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.

- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

- **Electronic File Format**
  - Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the California Energy Commission's (CEC) software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick.

  The following describes the accepted formats for electronic data and documents provided to the CEC as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:
  - Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
  - Text documents will be in MS Word file format, version 2007 or later.
  - Project management documents will be in Microsoft Project file format, version 2007 or later.

- **Software Application Development**

  Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
  - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
  - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
  - Visual Studio.NET (version 2008 and up). Recommend 2010.
  - C# Programming Language with Presentation (UI), Business Object and Data Layers.
  - SQL (Structured Query Language).
  - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
  - Microsoft SQL Reporting Services. Recommend 2008 R2.
  - XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the CEC's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other CEC staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The administrative portion of the meeting will include discussion of the following:
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Administrative products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Match fund documentation (subtask 1.7);
  - Permit documentation (subtask 1.8);
  - Subcontracts (subtask 1.9); and
  - Any other relevant topics.

  The technical portion of the meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
  - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
  - Project schedule that identifies milestones
  - List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.

- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Kick-off Meeting Presentation
- Updated Project Schedule *(if applicable)*
- Match Funds Status Letter (subtask 1.7) *(if applicable)*
- Permit Status Letter (subtask 1.8) *(if applicable)*

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive CEC funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the CEC and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient and may include the CAO and any other individuals selected by the CAM to provide support to the CEC.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare and submit a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* with a list of expected CPR participants in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a schedule for providing a Progress Determination on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)

CAM Products:

- CPR Agenda
- Progress Determination

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with CEC staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.
  - The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
  - The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
    - Disposition of any procured equipment.
    - The CEC's request for specific "generated" data (not already provided in Agreement products).
    - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
    - "Surviving" Agreement provisions such as repayment provisions and confidential products.
    - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary *(if applicable)*
- Schedule for Completing Agreement Closeout Activities
- All Final Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
  - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions, including a financial report on Match Funds and in-state expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Energy Commission Style Manual* provided by the CAM.

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Energy Commission Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Energy Commission Style Manual, and Final Report Template provided by the CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (**required**)
    - Credits page on the reverse side of cover with legal disclaimer (**required**)
    - Acknowledgements page (optional)

- Preface (**required**)
- Abstract, keywords, and citation page (**required**)
- Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
- Executive summary (**required**)
- Body of the report (**required**)
- References (if applicable)
- Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
- Bibliography (if applicable)
- Appendices (if applicable) (Create a separate volume if very large.)
- Attachments (if applicable)

- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
  - Comments the recipient proposes to incorporate.
  - Comments the recipient does propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.

- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:

- Summary of TAC Comments
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of CEC funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this

Agreement. If no match funds were part of the proposal that led to the CEC awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

If match funds were a part of the proposal that led to the CEC awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
  - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
  - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
  - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.

- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter *(if applicable)*
- Match Funds Reduction Notification Letter *(if applicable)*

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
  - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
  - The schedule the Recipient will follow in applying for and obtaining the permits.

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits *(if applicable)*
- Updated Schedule for Acquiring Permits *(if applicable)*
- Copy of Each Approved Permit *(if applicable)*

Subtask 1.9 Subcontracts

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of each executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts *(draft if required by the CAM)*

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.

- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Subtask 1.12 Project Performance Metrics

The goal of this subtask is to identify key performance targets for the project. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the draft *Project Performance Metrics Questionnaire* to the CAM prior to the Kick-off Meeting.
- Present the draft *Project Performance Metrics Questionnaire* at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
  - TAC comments the recipient proposes to incorporate into the final *Project Performance Metrics Questionnaire*.
  - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit a final *Project Performance Metrics Questionnaire* with incorporated TAC feedback.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the recipient met each of the performance metrics in the final *Project Performance Metrics Questionnaire*.
- Discuss the final *Project Performance Metrics Questionnaire* and *Project Performance Metrics Results* at the Final Meeting.

Products:

- Project Performance Metrics Questionnaire (draft and final)
- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2 PRELIMINARY MARKET ASSESSMENTS AND PRODUCT SELECTION

The goal of this task is to assess the three selected device types of laboratory equipment, commercial office equipment, and residential networking equipment and create a plan for the further evaluation of energy savings opportunities and device sourcing.

Task 2.1 Device Review and Assessment

The project team will extend prior work completed outside of this agreement by conducting a deep evaluation into the three specified subgroups to verify category breadth and common feature sets. This will include examining the current and projected future market for subgroup devices and a review of past and present domestic and international codes and standards, manufacturer voluntary agreements, and government mediated voluntary agreements/labeling programs.

The Recipient shall:

- Review existing product categorization, codes, and standards related to selected device types
- Examine the current and projected future market for these devices
- Examine past and present domestic and international codes and standards, manufacturer voluntary agreements, and government mediated voluntary agreements/labeling programs
- Categorize devices by each of the three subgroup and generate a representative *Device Type List*
- Collect preliminary energy usage information, device architecture and features from existing literature
- Determine common device features impacting device energy usage
- Draft a *Market Assessment Report* that includes but not limited to the device types for each subgroup, three subgroups' current and projected future market, past and present internation and domestic codes and standards, manufacturer voluntary agreements, government mediated voluntary agreement/labeling programs, and energy usage information for the devices.

Products

- Device Type List
- Market Assessment Report

Task 2.2 Device Segmentation and Analysis

For each of the three plug load device types, the project team will categorize and segment the market to identify representative devices and models based on common features. The team will use this information to collect energy and other relevant information on each device type in order to develop a representative model of each particular product category, its energy use, and energy savings potential.

The Recipient shall:

- Define device clusters based on common features or differing intended use cases, in addition to market price points and participation within existing programs such as ENERGY STAR.

- Identify devices targeted for specific market segments to assess participation in manufacturer voluntary agreements and government labeling programs (especially ENERGY STAR) in addition to any potential active codes and standards.
- Generate a Representative Model List including base models and regionally sold variants, if applicable.
- Collect preliminary energy usage information from nameplate values and published test results, where available.
- Where relevant values are available for device clusters or devices forming a common segment, add information into product categorization documents.
- Assessed device architecture and features from publicly available documentation.
- Identify and prioritize commonalities at the market level prior to device specific analysis.
- Develop a comparison matrix of features per developed device category clusters.
- Develop a list of common features that impact energy use and estimate their potential contributions to overall device energy use.
- Select specific products for testing under Task 3. Products will be intended to represent the device type / product category.
- Draft the *Plug Load Devices: Market Assessment and Energy Savings Opportunities Report (draft)* that incorporates all market assessment and energy estimates, research and recommendations developed under Task 2.2.
- Submit the Plug Load Devices: Market Assessment and Energy Savings Opportunities Report (draft) to the TAC and CAM for review and comment.
- Incorporate TAC and CAM comments into the final version of *Plug Load Devices: Market Assessment and Energy Savings Opportunities Report (final)*

Products

- Plug Load Devices: Market Assessment and Energy Savings Opportunities Report (draft and final)

TASK 3 DEVELOP PRODUCT TEST PROCEDURES

The goal of this task is to develop procedures for testing the three plug load device types and models/products identified and selected under Task 2. Considerations will include common subsystems contributing to energy use within each device type and opportunities for savings at the device level, which can be achieved by adopting commonly available architectures, components or operating modes.

Task 3.1: Plug Load Device Testing - Planning

The project team will develop a list of potential investigation points for evaluation of selected plug load devices. The list of potential test elements will include energy-related factors in design, workflow, and usage of device subsystems common to each device type / product category. The team will compare manufacturing designs and approaches, and select device performance thresholds that can be achieved using commonly available methods. For each component, the project team will develop preliminary savings opportunities and test methods to quantify energy use and savings for these components and operating strategies.

The Recipient Shall:

- Identify specific features potentially giving rise to high energy use across selected devices.

- Consider the balance between best practices versus specific designs that may be limited by IP restricted technology or specific design approaches that are highly vendor or manufacturer specific that could not be implemented without substantial core operating principal design changes.
- Identify common general usage patterns appreciably contributing to extended use (i.e., it is common to do something that keeps the device from entering lowest power move overnight when not in use and the device should otherwise be idle).
- Consider user interface or mode operational configurations leading to excessive energy usage.
- Identify common subsystems that are potential points for improved energy efficiency.
- Develop a list of specific benefits and barriers to entry for each consideration point.
- Evaluate general common and clustered device commonalities (including subsystems required to provide specific features as well as typical usage) for savings opportunities.
- Identify a threshold for code-compliant performance of device features/subsystems based on demonstrated device performance available with widely used device architectures or designs.
- Prepare *Plug Loads: Component Opportunities and Potential Savings Report* (draft and final) that includes all research, evaluations and recommendations developed under Task 3.1

Products:

- Plug Loads: Component Opportunities and Potential Savings Report (draft and final)

Task 3.2: Test Procedure Development

The project team will select devices based on considerations developed in Task 3.1 and develop test procedures on a per-device-type basis but common to all devices within the same category. Testing will include a functional usage period and a second tear down and subsystem investigation. Values such as energy use in different modes as well as total energy use and switching states based on user's typical action (or inaction) will be recorded.

The Recipient Shall:

- Select a minimum of 15 devices from the selected three subgroups.
- Evaluate energy use of device components and/or subsystems under all available operating modes.
- Develop a comparison matrix of common features for testing of each device type.
- Consult manufacturers for specific plug load device development timelines and update test plans with regard to forthcoming energy efficiency developments.
- Determine the current baseline and best-in-class low power and idle device modes to consider as part of testing.
- Develop new or improve existing test procedures for measuring total energy consumption for future consideration by codes and standards. Test a minimum of 15 devices from the selected 3 subgroups (total of 15 devices). Identify at least 2 manufacturing partners for the entire project associated with the selected devices. Specify the regulatory (e.g. California appliance standards) or market standard (e.g., ASHRAE) to be targeted and why.
- Document the new or improved test procedures and research and evaluation conducted in Subtask 3.2 in *Plug Load Devices: Proposed Test Procedures (draft)*

- Ensure that the new or improved test procedures are peer reviewed by the technical advisory group (TAC).
- Update the test procedure document based on TAC feedback and finalize test procedures in *Plug Load Devices: Proposed Test Procedures (final)*.

Products

- Plug Load Devices: Proposed Test Procedures (draft and final)

Task 3.3: Device Sourcing

Based on results of task 2, the project team will select and procure specific devices for testing. Tear-down devices will be purchased from general stock. Additional sample devices will also be purchased; where possible, this stage of testing will be conducted on rented equipment or currently owned devices in-situ to reduce costs.

The Recipient Shall:

- Select and procure devices for testing
- Create a product inventory list
- Draft a *Product Test List and Inventory* to include a list of procured devices for testing
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Product Test List and Inventory
- CPR Report #1

TASK 4 PRODUCT TESTING AND ANALYSIS

The goal of this task is to test the selected devices, analyze results, identify opportunities for codes and standards according to the test results, and model the energy impacts of code change recommendations to understand statewide impacts.

Task 4.1: Device Testing

The project team will create test reconfiguration procedures and apparatus; and specific device test automation processes and setups for each plug load device type to include both Device 1 (tear-down device) and sample devices. The project team will complete the testing developed in Task 3. If substantial differences are observed across devices, these will be evaluated for root cause.

The Recipient shall:

- Test reconfiguration and specific device test automation set up for each device prior to launching full testing program. If substantial differences arise, they will be evaluated for the root cause and adjusted.
- Validate/confirm testing methods and protocols on a small subsample of devices. Develop test improvements to plug load devices using the develop test procedures, if needed.
- Perform specified tests using final procedures developed under Task 3.2 and refine under this task, if needed.
- Determine a detailed dataset that may be considered for adoption through codes and standards that may include the following:
    - Baseline power use per mode kWh/h

- Hours of operation for modes or use cycles
- Baseline annual energy use per unit
- Proposed best-in-class or advanced annual energy use per unit
- Incremental cost of best-in-class or advanced products (parts, labor, and maintenance)
- Lifecycle energy/other cost savings of baseline products

- Determine power consumption during low power and idle modes and compare to total energy consumption for the selected devices.
- Assess the effects of connected device interactions, when applicable, comparing total system power consumption with stand-alone power consumption of individual devices.
- Compile *Test Results Report* that includes, but is not limited to, detailed dataset listed in Task 4.1, power consumption of the specific devices during low power and idle modes, total energy consumption, connected devices interactions power consumption, and any differences observed across devices and the root cause.

Products

- Test Results Report

Task 4.2: Results Analyses

The goal of this task is to analyze the test data for commonalities and differences among tested samples across each device type / product category and perform a gap analysis on the results to assess specific device features and components that differ, and which may be opportunities for new codes and standards. For device types or products where no variation in energy performance exists, the project team may consider other opportunities to promote quality products such as labeling or manufacturer voluntary agreements to develop new and improved device features.

The Recipient Shall:

- Perform and assess gap analysis to identify codes and standards opportunities.
- Determine whether it would be cost-effective to control low power and/or idle mode for the selected devices.
- Determine if and how the selected plug loads can be managed to provide electric load flexibility for reducing customer bills and carbon emissions.
- Draft a *Test Results and Recommendations* chapter for the final project report documenting all test results, analysis and resulting codes and standards recommendations.
- Compile final testing and evaluation procedures with updates to allow easy use in different labs and/or future evaluations.
- Draft a *Technical Report on Testing Procedures (draft)* that documents all test procedures and instructions for each device type / product category.
- Submit the Technical Report on Testing Procedures to the TAC for review and comment.
- Ensure TAC comments are incorporated into *Technical Report on Testing Procedures (final)*

Products

- Test Results and Recommendations (draft)
- Technical Report on Testing Procedures (draft and final)

Task 4.3: Model Measures and Estimate Savings

The goal of this task is to incorporate codes and standards recommendations for each device type / product category into a market model that considers future levels of device replacement and growth for the current installed device base to determine energy savings potential and report results.

The Recipient Shall:

- Based on known usage patterns, develop an energy-use model based on device testing and details of evaluated energy usage for device operation using the Subcontractor's PLSim tool.
- Evaluate the range of expected energy savings for multiple devices in clusters across a device population to assess the impact of recommended codes and standards updates given different adoption levels and timelines as compared to the current population baseline.
- Justify recommendations for near-term code implementation for the tested plug load devices based on modeling and other analyses, including determination of cost effectiveness. Include an estimate of the cost of the improvements to manufacturers and corresponding increase in retail prices whenever possible.
- Compile statewide energy savings and cost-effectiveness analyses using models and summarize findings and recommendations in *Plug Loads: Codes and Standards Impacts Report*.
- Submit the *Plug Loads: Codes and Standards Impacts* report for TAC peer review prior to revision and incorporation into Final Report (Task 1.6).
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Plug Loads: Codes and Standards Impacts Report
- CPR Report #2

TASK 5 EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

    - For Information/Tools and Other Research Studies:
        - Outcome of project.
        - Published documents, including date, title, and periodical name.

- A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
- The number of website downloads.
- An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
- An estimate of energy and non-energy benefits.
- Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
- A discussion of project product downloads from websites, and publications in technical journals.
- A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.

- Respond to CAM questions regarding responses to the questionnaires.

The CEC may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 6 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to ensure the scientific and techno-economic analysis and tools developed under this agreement are utilized in the energy policy, and/or planning decisions at the state and/or local levels, academic community and/or commercial sector.

The Recipient Shall:

- Develop and submit a *Knowledge Transfer Plan (Draft/Final)* that identifies the proposed activities the recipient will conduct to meet the goal of the task. The *Knowledge Transfer Plan* should include at a minimum:
  - Specific policy and planning efforts this project is expected to inform.
  - Specific stakeholder groups and energy policy and planning practitioners who will utilize the results of this project.
  - Proposed activities the recipient will conduct to ensure the tools and results from this project be utilized and adopted by the groups identified above.
- Present the *Draft Knowledge Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Knowledge Transfer Plan*. This document will identify:
  - TAC comments the recipient proposes to incorporate into the *Final Knowledge Transfer Plan*.

- TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the *Final Knowledge Transfer Plan* to the CAM for approval.
- Implement the activities as described in the *Final Knowledge Transfer Plan.*
- Develop a *Knowledge Transfer Summary Report (Draft/Final)* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the *Final Technology Transfer Plan*. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

Products:

- Knowledge Transfer Plan (Draft/Final)
- Summary of TAC Comments
- Technology Transfer Summary Report (Draft/Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 21-0210-8b

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: CALIFORNIA ENERGY ALLIANCE

RESOLVED, that the State Energy Resources Conservation and Development Commission (CEC) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the CEC approves Agreement EPC-20-010 with California Energy Alliance for a $996,974 grant to conduct a study to: 1) evaluate the energy consumption of selected commercial and residential plug load device types, 2) quantify their statewide market size and energy use, 3) determine potential energy and cost savings, and 4) consider future energy codes and standards; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the CEC.

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the CEC held on February 10, 2021.

AYE:
NAY:
ABSENT:
ABSTAIN:

_____
Cody Goldthrite
Secretariat