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

A) New Agreement # EPC-21-033 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Maninder Thind		916-776-0819

C) Recipient's Legal Name	Federal ID Number
Lawrence Berkeley National Laboratory	94-2951741

D) Title of Project
The Cooking Electrification and Ventilation Improvements for Children's Asthma (CEVICA)

E) Term and Amount

Start Date	End Date	Amount
5/30/2022	3/31/2026	$ 4,000,000

F) Business Meeting Information

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

Proposed Business Meeting Date 5/11/2022 ☐ Consent ☒ Discussion

Business Meeting Presenter Maninder Thind Time Needed: 5 minutes

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

Agenda Item Subject and Description:
Lawrence Berkeley National Laboratory
Proposed resolution approving Agreement EPC-21-033 with Lawrence Berkeley National Laboratory for a $4,000,000 grant to investigate the impact of cooking electrification, ventilation, and other interventions on indoor air quality and the respiratory health of children with asthma in under-resourced communities in California, and adopting staff's determination that this action is exempt from CEQA. This research will help guide policies related to building electrification, investments in low-income housing retrofits, and asthma and healthy homes programs to mitigate the environmental and health impacts of energy end uses in California. (EPIC funding) Contact: Maninder Thind (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, § 15306
      ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section: Cal. Code Regs., tit. 14, sect. 15306 consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. This project is exempt under Cal. Code Regs., tit. 14, § 15306 because this is a research project that involves measurement of air quality and asthma assessment among children in the households of under-resourced communities of California. For these reasons, the proposed research project will have no significant effect on the environment and is categorically exempt under section 15306.

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**
Central California Asthma Collaborative	$ 999,217
Association for Energy Affordability, Inc.	$ 600,000
Regents of the University of California, on behalf of the San Francisco Campus	$ 439,675
Regents of the University of California, on behalf of the Los Angeles Campus	$ 408,000
Central California Environmental Justice Network	$ 75,000
Little Manila Foundation	$ 25,000
TBD Electrician (installing new circuits and completing additional onsite work)	$ 98,250
TBD HVAC Sub (installing ventilation and completing additional onsite work)	$ 98,250
TBD Appliance Installer (installing stove)	$ 35,400
	$

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

Legal Company Name:

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J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	20-21	301.001H	$400,811
EPIC	21-22	301.001I	$3,599,189
			$
			$
			$
			$

R&D Program Area: EGRO: EA TOTAL: $ 4,000,000

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Monique Fix

Address: 1 Cyclotron Rd

City, State, Zip: Berkeley, CA 94720-8099

Phone: 510-486-5068

E-Mail: MFix@lbl.gov

2. Recipient's Project Manager

Name: Brett Singer

Address: 1 Cyclotron Rd

City, State, Zip: Berkeley, CA 94720-8099

Phone: 510 486 4779

E-Mail: BCSinger@lbl.gov

L) Selection Process Used

☒ Competitive Solicitation Solicitation #: GFO-21-301

☐ First Come First Served Solicitation Solicitation #:

☐ Non-Competitive Bid Follow-on Funding (SB 115)

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
Lawrence Berkeley National Laboratory

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Incorporate Cooking Electrification and Other Interventions into Home-Based Asthma Management Program
3	X	Prepare Protocols and Equipment and Conduct Training for In-Home Studies
4	X	Collect and Analyze Data from Households in Each Study Arm
5		Collect Data from Additional Homes
6		Analyze Full Dataset and Produce Technical Manuscripts
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CCAC	Central California Asthma Collaborative
CEC	California Energy Commission
CEVICA	Cooking Electrification and Ventilation Improvements for Children's Asthma (the proposed study name)
CHW	Community Health Worker
CO	Carbon monoxide, an air pollutant that interferes with the oxygen-carrying capacity of the bloodstream. Exposures at levels above health-based standards can cause dull headache, weakness, dizziness. Higher exposures can cause nausea or vomiting, shortness of breath, confusion, blurred vision. Very high exposures can result in loss of consciousness.
CPR	Critical Project Review
Disadvantaged Community	These are communities designated pursuant to Health and Safety Code section 39711 as representing the top 25% scoring census tracts from CalEnviroScreen along with other areas with high amounts of pollution and low populations as identified by the California Environmental Protection Agency (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30)
IAQ	Indoor Air Quality
Intervention	Strategy to improve health outcomes or affect health-promoting behavior changes among individuals or population. An intervention can take the form of deployment of new or proven technologies, educational campaigns, and other strategies.

[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.

IRB	Institutional Review Board, a federally registered body that oversees research involving human subjects.
NO_2	Nitrogen dioxide, a health-damaging gaseous pollutant produced by combustion of gas fuels such as natural gas in stoves.
NO_X	Nitrogen oxides, a group of chemicals produced by combustion
$PM_{2.5}$	Particulate matter less than 2.5 μm in aerodynamic diameter (also called fine particles); a health-damaging pollutant produced by combustion processes and cooking.
Principal Investigator (PI)	The technical lead for the applicant's project, who is responsible for overseeing the project; in some instances, the Principal Investigator and Project Manager may be the same person.
REDCap	A secure web application for building and managing online surveys and databases, used for data collected in studies with human subjects.
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 conduct randomized control studies to investigate the impact of cooking electrification and other interventions — including replacement of gas ranges with electric-induction, use of 120V countertop electric appliances to reduce gas range use, kitchen ventilation, Indoor Air Quality (IAQ) information, and use of portable air cleaners — in the homes of children with asthma in under-resourced communities within California. Research conducted under this agreement will provide empirical evidence of the IAQ and health benefits of cooking electrification and other interventions to help guide future policies related to building electrification, investments in low-income housing retrofits, and asthma and healthy homes programs to mitigate the environmental and health impacts of energy end uses in California.

B. Problem/ Solution Statement

Problem

Natural gas cooking burners introduce air pollutants into homes in quantities that can exceed health hazard thresholds. Pollutants from gas burners include nitrogen dioxide (NO_2), a respiratory irritant, and carbon monoxide (CO). Homes with gas cooking thus have higher concentrations of these air pollutants than homes with electric cooking. Both gas cooking and household NO_2 levels are thought to contribute to asthma and other breathing symptoms in children. Frying and some other cooking activities emit fine particulate matter ($PM_{2.5}$), acrolein, and other chemicals that can reach hazardous levels in homes when not properly vented. Burner- and cooking-related air pollutants reach higher concentrations in homes that are smaller and have more cooking. The potential burden of this hazard is thus thought to be higher in low-income households, which also tend to have higher rates of childhood asthma. Kitchen exhaust ventilation can be used to remove a fraction of the generated burner and cooking pollutants before they mix into the home. However, many existing homes in California do not have operational or adequate kitchen ventilation. Even when available, cooking ventilation is often not used effectively to reduce pollutant exposures. Solutions to reduce exposure to cooking-related air pollutants are less

accessible to renters and low-income homeowners. Programs that provide home-based asthma management services or more general healthy housing improvements to low-income households rarely cover the costs of switching from gas to electric cooking and inconsistently cover kitchen ventilation retrofits.

Solution

Replacement of gas cooking burners with electric appliances should dramatically reduce levels of combustion-related air pollution inside homes. This can be accomplished by replacing a gas stove with an electric appliance or through use of 120V countertop electric cooking appliances. The availability and use of kitchen exhaust ventilation should additionally reduce levels of both burner- and cooking-related pollutants, and portable air filtration along with indoor air quality information may enable reductions in cooking particle levels in homes that lack kitchen ventilation. By reducing air pollutant levels inside homes, these controls have the potential to improve health outcomes for children with asthma or anyone with a chronic respiratory health condition. Quantifying these exposure reduction and health benefits with the rigorous methods of a randomized control trial could motivate more programs to cover the cost to install them.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to quantify the benefits of utilizing cooking electrification and other interventions to reduce air pollutant exposures and improve the respiratory health of children with asthma, particularly in under-resourced areas of California.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefit of increased safety by reducing in-home exposures to air pollutants generated by natural gas cooking burners and also by cooking, irrespective of the burner fuel. The Agreement will focus on implementing controls to the benefit of children with asthma in income-qualifying households in areas in and around Kern, Fresno, and San Joaquin counties.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by advancing cooking electrification and the availability and use of other technologies and approaches to mitigate the impacts of indoor air pollution from cooking and cooking burners. The project will quantify the impacts of replacing natural gas cooking ranges with electric induction ranges or using 120V countertop electric appliances to reduce gas range use. The project will also quantify the benefits of ensuring that homes have adequate kitchen exhaust ventilation or portable air cleaners, and the occupants know to use them for exposure reduction. The project will develop and demonstrate the integration of these controls into a home-based asthma control program that serves income-qualifying households in areas in and around Kern, Fresno and San Joaquin counties. The costs and challenges of

[2] 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).

[3]

replacing gas ranges and ensuring that homes have adequate kitchen exhaust ventilation will be documented and used to develop recommendations for program design. Findings from the project will be transferred via technical manuscripts submitted to scientific journals and presentations to key stakeholders and to the public.

Agreement Objectives

The objectives of this Agreement are to:

- Quantify the separate and synergistic benefits of (a) replacing natural gas with electric induction cooking ranges and (b) providing kitchen exhaust ventilation with education to reduce air pollutant exposures for all occupants and improve respiratory health for children with asthma living in low-income California households.
- Quantify the exposure reduction and asthma control benefits of displacing use of a gas cooking range with 120V, countertop, electric cooking appliances as a moderate-cost and scalable intervention that can reach renters and homeowners for whom gas range replacement is not readily feasible.
- Quantify the exposure reduction and asthma control benefits of indoor air quality information, education and portable air cleaners as a synergistic mitigation with countertop cooking electrification.
- Develop recommendations to accelerate the electrification of cooking by gas to electric range replacement and improvements in kitchen exhaust ventilation availability and use in disadvantaged communities within California's Central Valley.

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.

Exhibit A
Scope of Work
Lawrence Berkeley National Laboratory

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(s)
- 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 <u>no permits</u> 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.

Exhibit A
Scope of Work
Lawrence Berkeley National Laboratory

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 finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. 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 project performance metrics from the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics 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 *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
  - TAC comments the Recipient does not propose to incorporate with and explanation why.
- 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 Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:
- TAC Performance Metrics Summary
- Project Performance Metrics Results

TECHNICAL TASKS

TASK 2: INCORPORATE COOKING ELECTRIFICATION AND OTHER INTERVENTIONS INTO HOME-BASED ASTHMA MANAGEMENT PROGRAM
The goal of this task is to incorporate cooking electrification, kitchen ventilation, filtration and education interventions into an existing home-based asthma management program.

The Recipient shall:
- Develop a protocol to assess the adequacy of kitchen exhaust ventilation that can be implemented by community health workers (CHW) as part of a home asthma program visit.
- Develop a checklist and data form for CHWs to screen homes with gas cooking ranges for their potential to have an electric induction range installed as a replacement, or to accommodate 120V electric cooking appliances.
- Develop a checklist and data form to document the potential to replace or install kitchen exhaust ventilation in homes where it is not currently present.
- Train the CHWs of the Central California Asthma Collaborative (CCAC) on the protocols for assessment of kitchen ventilation and cooking electrification potential.
- Develop expertise among the collaborating community-based organizations on the use of induction cooktops and 120V electric appliances.
- Develop procedures for community-based organizations to educate program participants on the use of induction cooktops and to select a package of 120V electric appliances to maximize the displacement of gas range use when range replacement is infeasible.
- Develop an educational module to provide Arm 2 participants with information about the impacts of shifting gas range use to 120V countertop electric appliances (as collected during Phase 1).
- Develop an educational module for the use of real-time IAQ monitoring and portable air cleaners to reduce fine particle concentrations from cooking.
- Incorporate all procedures and data forms described above, along with the educational materials developed to motivate and guide kitchen exhaust ventilation use, into CCAC's home asthma management program.
- Develop additional questions for the intake, feedback and final program assessment forms of the CCAC asthma program to include feedback about the cooking electrification and mitigation assessments.

- Produce a set of *Enhanced Asthma Program Data Collection Forms* that incorporate the elements noted above.
- Identify, vet and set up contracts with contractors to conduct the electrical upgrades and replace or install kitchen ventilation within each study location.
- Develop arrangements for scheduling and consultations between CCAC and Association for Energy Affordability (AEA).
- Conduct at least 2 field training visits for each CCAC team to practice implementing protocols for kitchen ventilation and electrical upgrade potential.
- Review feedback from program participants and obtain feedback from CHWs at the end of the first year of data collection; revise protocols as appropriate.
- Review feedback from program participants and obtain feedback from CHWs at the end of the second year of data collection and analyze to identify potential improvements
- Develop the *Asthma Program Enhancements to Address Gas-Burner and Cooking-Related Pollutants Presentation* describing the enhancements to CCAC's Asthma Impact Model to reduce exposures to air pollutants from gas burners and cooking that were developed for this study and lessons learned from implementing the measures with program participants.

Products:

- Enhanced Asthma Program Data Collection Forms
- Asthma Program Enhancements to Address Gas-Burner and Cooking-Related Pollutants Presentation

TASK 3 PREPARE PROTOCOLS AND EQUIPMENT AND CONDUCT TRAINING FOR IN-HOME STUDIES

The goal of this task is to develop all protocols, obtain and prepare all equipment, and conduct staff training as needed to complete and implement field studies to quantify the IAQ and health benefits of electrifying cooking and implementing other controls in low-income households with children with asthma.

The Recipient shall:

- Develop all subject interaction protocols required to recruit and include participants of CCAC's Asthma Impact Program in research studies involving human subjects, and follow all applicable laws and requirements associated with research studies involving human subjects.
- Develop detailed Draft Protocols for Intensive IAQ, Ventilation and Equipment Use Monitoring.
- Develop detailed protocols for respiratory performance testing of children, including spirometry and fractional exhaled nitric oxide (FeNO).
- Develop and submit a human subject research protocol for review by the LBNL Human Subjects Committee (institutional review board, or IRB) and modify as needed to obtain approval.
- Arrange IRB reliance for other institutions and ensure that participating researchers at all institutions have all required training.
- Procure and assemble all monitoring and measurement equipment.
- Conduct co-location experiments to cross-check and develop calibration adjustments for all IAQ instruments and check all ventilation and equipment monitoring devices.

- Develop a draft report on *Statistical Analysis Plan* consistent with best practices laid out in the CONSORT Guidelines and provide to TAC for review and input.
- Revise and post the *Statistical Analysis Plan* to Open Science Framework.
- Train staff of CCAC to implement the in-home measurement protocols, including installation of ventilation and equipment monitors and setting up local wireless communication networks.
- Train staff of CCAC to conduct respiratory performance testing of children (spirometry and FeNO).
- Create final report on *Protocols for Intensive IAQ, Ventilation and Equipment Use Monitoring.*
- Prepare and provide *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR Meeting.

Products:
- Statistical Analysis Plan
- Protocols for Intensive IAQ, Ventilation and Equipment Use Monitoring
- CPR Report #1

TASK 4 COLLECT AND ANALYZE DATA FROM HOUSEHOLDS IN EACH STUDY ARM
The goal of this task is to recruit subjects and implement field study protocols in the selected homes for each study arm.

The Recipient shall:
- Use IRB-approved protocols and materials to recruit from among the matriculated participants in CCAC's asthma management program and other approved mechanisms.
- Implement assessment protocols, develop retrofit cost estimates, offer participation and obtain consent agreements for at least 40 households (or smaller number as approved in writing by the CAM) for Arm 1.
- Recruit and obtain consent for at least 40 households (or smaller number as approved in writing by the CAM) for Arm 2.
- Implement randomization procedures to assign homes to groups within each arm.
- Implement all study protocols to collect baseline data in the homes and from the children of the selected consented households.
- Implement all retrofits required for Arm 1 and provide appliance packages for Arm 2.
- Implement planned interventions for two study phases in Arm 1 and three study phases in Arm 2.
- Collect data and samples in the homes and from the children for two study phases in Arm 1 households and three study phases in Arm 2 households using the methods and techniques detailed in the section 2.F Specific Requirements of Project Narrative, which is incorporated into this SOW.
- Upload all sensitive study data to REDCap.
- Upload coded, non-identifiable environmental and equipment data to a secure database, as specified in the IRB-protocol.
- Conduct laboratory analyses of passive NO_2/NO_X samples and filters and add results to the study database.
- Conduct quality assurance review of all data collected from the first 80 study homes.
- Conduct preliminary statistical analysis of data collected from at least the first phases of Arm 1 and Arm 2 for consideration during critical project review.

- Compile information on the suitability of homes to receive a range replacement, needs for kitchen ventilation and costs to implement each in the Arm 1 homes.
- Conduct a critical project review with the CAM to confirm or modify the plan to focus on Arm 1 for all subsequent recruitment and study implementation.
- Solidify study plan for following year of data collection.
- Complete quality assurance review and analysis of IAQ, ventilation and equipment use data from the first 80 study homes.
- Prepare a *Preliminary Year 1 Results TAC Presentation* to present it to TAC that includes analysis of IAQ, ventilation and equipment use data from the first 80 or other approved number (n) of study homes.
- Prepare a draft of *CEVICA Study of Cooking Electrification in Low-Income California Households: Preliminary Results Manuscript* reporting IAQ, ventilation and equipment use results from the first year of data collection including one or both arms.
- Prepare a final of *The CEVICA Study of Cooking Electrification in Low-Income California Households: Preliminary Results Manuscript* and submit to a peer-reviewed scientific journal.
- Modify study protocols as needed, based on lessons learned from the first n homes.
- Provide and install electric induction ranges in all Arm 1 study homes that were assigned to the control group during the first year of data collection.
- Prepare and provide *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR Meeting.

Products:
- Preliminary Year 1 Results TAC Presentation
- Draft and Final CEVICA Study of Cooking Electrification in Low-Income California Households: Preliminary Results Manuscript
- CPR Report #2

TASK 5 COLLECT DATA FROM ADDITIONAL HOUSEHOLDS
The goal of this task is to recruit subjects and implement field study protocols in additional homes, divided among arms as agreed during the CPR.

The Recipient shall:
- Use IRB-approved protocols and materials to recruit from among the matriculated participants in CCAC's asthma management program and other approved mechanisms to obtain another at least 80 consented households (or smaller number as approved in writing by the CAM) for Year 2 of data collection.
- Implement electrical and ventilation viability assessments, cost estimates and selection to obtain the planned second year sample for Arm 1.
- Implement randomization procedures to assign homes to groups within each arm.
- Implement study protocols to collect data from each home and each child at baseline for the participating Year 2 households.
- Implement retrofits and kitchen ventilation interventions for Arm 1 participants and provide appliance packages for Arm 2 participants.
- Collect data and samples in the homes and from the children for two study phases in Arm 1 households and three study phases in Arm 2 households using the methods and techniques detailed in the section 2.F Specific Requirements of Project Narrative, which is incorporated into this SOW. Upload all sensitive study data to REDCap.

- Upload coded, non-identifiable environmental and equipment data to a secure database, as specified in the IRB-protocol.
- Conduct laboratory analyses of passive NO_2/NO_X samples and filters and add results to the study database.
- Conduct quality assurance review of all data collected from the Year 2 study homes.
- Produce a *Quality-Assured, Reviewed, and De-identified Dataset* for analysis in Task 6.

Products:
- *Quality-Assured, Reviewed, and De-identified Dataset and a Memorandum*

TASK 6 Analyze Full Dataset and Produce Technical Manuscripts
The goal of this task is to analyze the IAQ, ventilation and equipment use data collected from homes and the health assessment data collected from and about the study subjects and produce manuscripts that will be submitted to scientific journals to maximize their value and use in cost-benefit analyses of cooking electrification and other interventions.

The Recipient shall:
- Complete analyses of IAQ, ventilation and equipment use data for Arm 1 and separately for Arm 2, using all data available from both years of data collection.
- Complete analyses of asthma outcome data for Arm 1 and separately for Arm 2, using all data available from both years of data collection.
- Prepare a *Full Study Preliminary Year 1 Results TAC Presentation* to present it to TAC
- Prepare *Manuscripts that document study results* and submit to journals.

Products:
- Full Study Preliminary Results TAC Presentation
- Manuscripts that document study results

TASK 7 EVALUATION OF PROJECT BENEFITS
The goal of this task is to report the benefits resulting from this project.

The Recipient shall:
- Complete *the Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by December 15th of each year. The Annual Survey includes but is not limited to the following information:
    - Technology commercialization progress
    - New media and publications
    - Company growth
    - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and

provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.

- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)
- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

TASK 8 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

IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 22-0511-19

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: LAWRENCE BERKELEY NATIONAL LABORATORY

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-21-033 with Lawrence Berkeley National Laboratory for a $4,000,000 grant to investigate the impact of cooking electrification, ventilation, and other interventions on indoor air quality and the respiratory health of children with asthma in under-resourced communities in California. This research will help guide policies related to building electrification, investments in low-income housing retrofits, and asthma and healthy homes programs to mitigate the environmental and health impacts of energy end uses in California; and

FURTHER BE IT RESOLVED, that the Executive Director or their 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 May 11, 2022.
AYE:
NAY:
ABSENT:
ABSTAIN:

Liza Lopez
Secretariat