CALIFORNIA
ENERGY COMMISSION

California Energy Commission
July 10, 2024 Business Meeting
Backup Materials for Build It Green

The following backup materials for the above-referenced agenda item are available in this PDF packet as listed below:

1. Proposed Resolution
2. Grant Request Form
3. Scope of Work

[PROPOSED]

RESOLUTION NO: 24-0710-11

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: Build It Green

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-24-005 with Build It Green for a $4,775,000 grant. This project will design, develop and field test in various IOU territories, and create a business plan for an easy-to-use electrical panel optimization tool to guide single family homeowners to adopt cost-effective electrification pathways that avoid unnecessary panel upsizing and increased grid loads; 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 July 10, 2024.

AYE:
NAY:
ABSENT:
ABSTAIN:

Dated:

____
Kristine Banaag
Secretariat

STATE OF CALIFORNIA
CALIFORNIA ENERGY COMMISSION

CEC-270 (Revised 01/2024)

GRANT REQUEST FORM (GRF)

A. New Agreement Number

IMPORTANT: New Agreement # to be completed by Contracts, Grants, and Loans Office.

New Agreement Number: EPC-24-005

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Felix Villanueva
3. MS-:51
4. Phone Number: 916-232-8997

C. Recipient's Information

1. Recipient's Legal Name: Build It Green
2. Federal ID Number: 20-0939449

D. Title of Project

Title of project: A Decision Tool to Electrify Homes with Limited Electrical Panel Capacity

E. Term and Amount

1. Start Date: 8/1/2024
2. End Date: 4/30/2028
3. Amount: $4,775,000.00

F. Business Meeting Information

1. Are the ARFVTP agreements $75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 7/10/2024.
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Felix Villanueva
5. Time Needed for Business Meeting: 5 minutes.
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

Agenda Item Subject and Description:

Proposed resolution approving agreement EPC-24-005 with Build It Green for a $4,775,000 grant, and adopting staff's determination that this action is exempt from CEQA. This project will design, develop and field test in various IOU territories, and create a business plan for an easy-to-use electrical panel optimization tool to guide single family homeowners to adopt cost-effective electrification pathways that avoid unnecessary panel upsizing and increased grid loads. (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

   If yes, skip to question 2.

   If no, complete the following (PRC 21065 and 14 CCR 15378) and explain why Agreement is not considered a "Project":

Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because:

2. **If Agreement is considered a "Project" under CEQA answer the following questions.**
   a) Agreement **IS** exempt?

   Yes

   Statutory Exemption?
   No

   If yes, list PRC and/or CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

   PRC section number: None

   CCR section number: None

   Categorical Exemption?
   Yes

   If yes, list CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

   CCR section number: Cal. Code Regs., tit. 14, § 15301 ; Cal. Code Regs., tit. 14, § 15306 ;

   Common Sense Exemption? 14 CCR 15061 (b) (3)
   No

   If yes, explain reason why Agreement is exempt under the above section. If no, enter "Not applicable" and go to the next section.

   California Code of Regulations, title 14, section 15301 provides that projects that consist of the operation, repair, maintenance, permitting, licensing, and minor alteration of existing public or private structures, facilities, and mechanical equipment, involving negligible or no expansion of use, are categorically exempt from the provisions of CEQA. This project involves analysis of existing electrical panels and installation of electric appliances and energy management systems within existing facilities. Therefore, the project falls under Section 15301 and will not have a significant impact on the environment.

   California Code of Regulations, title 14, section 15306 provides that projects that consist of basic data collection, research, experimental management, and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource are categorically exempt from the provisions of CEQA. This project involves data collection and analysis to be conducted in existing single-family residential buildings and in existing offices of the grant recipient team. The proposed project's data analysis activities will have no significant effect on the environment and fall within the categorical exemption of section 15306.
   This project does not involve impacts on any particularly sensitive environment; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state

scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2 apply to this project and this project will not have a significant effect on the environment.

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

No

If yes, answer yes or no to all that applies. If no, list all as “no” and “None” as “yes”.

Additional Documents	Applies
Initial Study	No
Negative Declaration	No
Mitigated Negative Declaration	No
Environmental Impact Report	No
Statement of Overriding Considerations	No
None	Yes

H. Is this project considered “Infrastructure”?

No

I. Subcontractors

List all Subcontractors listed in the Budget (s) (major and minor). Insert additional rows if needed. If no subcontractors to report, enter “No subcontractors to report” and “0” to funds. **Delete** any unused rows from the table.

Subcontractor Legal Company Name	CEC Funds	Match Funds
Central California Asthma Collaborative	$ 319,616	$0
DOE- Lawrence Berkeley National Laboratory	$ 800,000	$250,000
QuitCarbon Inc	$ 599,999	$79,998
SPUR – San Francisco Bay Area Planning and Urban Research Association	$ 209,629	$0
TRC Engineers, Inc.	$ 1,450,470	$1,945,600
Home Energy Analytics	$ 95,000	$25,000
Redwood Energy, LLC	$ 98,000	$0
Tom Kabat	$ 97,000	$0
To Be Determined (Tool Development and Installation)	$ 105,249	$0

J. Vendors and Sellers for Equipment and Materials/Miscellaneous

List all Vendors and Sellers listed in Budget(s) for Equipment and Materials/Miscellaneous. Insert additional rows if needed. If no vendors or sellers to report, enter “No vendors or sellers to report” and “0” to funds. **Delete** any unused rows from the table.

Vendor/Seller Legal Company Name	CEC Funds	Match Funds
No vendors to report	**$**	**$**

K. Key Partners

List all key partner(s). Insert additional rows if needed. If no key partners to report, enter “No key partners to report.” **Delete** any unused rows from the table.

Key Partner Legal Company Name
No key partners to report

L. Budget Information

Include all budget information. Insert additional rows if needed. If no budget information to report, enter “N/A” for “Not Applicable” and “0” to Amount. **Delete** any unused rows from the table.

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	22-23	301.001J	$ 4,775,000

TOTAL Amount: $ 4,775,000

R&D Program Area: ICMB: Buildings

Explanation for “Other” selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: Not applicable

M. Recipient’s Contact Information

1. Recipient’s Administrator/Officer

Name: Kurt Kniel

Address: 300 Frank H Ogawa Plz Ste 620 Suite 301

City, State, Zip: Oakland, CA 94612-2056

Phone: 510-590-3360

E-Mail: kkniel@builditgreen.org

3. Recipient’s Project Manager

Name: Jenny Low

Address: 300 Frank H Ogawa Plz Ste 620 Suite 301

City, State, Zip: Oakland, CA 94612-2056

Phone: 510-590-3360

E-Mail: jlow@builditgreen.org

N. Selection Process Used

There are three types of selection process. List the one used for this GRF.

Selection Process	Additional Information
Competitive Solicitation #	GFO-23-303
First Come First Served Solicitation #	Not applicable
Other	Not applicable

O. Attached Items

1. List all items that should be attached to this GRF by entering "Yes" or "No".

Item Number	Item Name	Attached
1	Exhibit A, Scope of Work/Schedule	Yes
2	Exhibit B, Budget Detail	Yes
3	CEC 105, Questionnaire for Identifying Conflicts	Yes
4	Recipient Resolution	No
5	Awardee CEQA Documentation	No

Approved By

Individuals who approve this form must enter their full name and approval date in the MS Word version.

Agreement Manager: Felix Villanueva

Approval Date: 5/24/2024

Branch Manager: Anthony Ng

Approval Date: 5/31/2024

Director: Anthony Ng for Jonah Steinbuck

Approval Date: 5/31/2024

EXHIBIT A
Scope of Work
Build It Green

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Power Efficient Electrification Solutions
3	X	Past Upsized Homes Analysis
4		Community Advisory Board
5	X	Field Study - Home Electrical Load Analysis
6		Panel Optimization Decision Engine
7		Panel Optimization Tool UI Development
8		Field Demonstration with Panel Optimization Tool
9		Business Model and Commercialization Plan
10		Evaluation of Project Benefits
11		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
API	Application Programming Interface
CAB	Community Advisory Board
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
IOU	Investor-Owned Utility
NEC	National Electrical Code
PED	Power Efficient Design
TAC	Technical Advisory Committee
UI	User Interface
UX	User Experience

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

The purpose of this Agreement is to fund the design, development, field testing, and business planning for an easy-to-use panel optimization tool (the Tool) to guide single family homeowners to adopt cost-effective electrification pathways that avoid unnecessary panel upsizing and increased grid loads.

[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.

EXHIBIT A
Scope of Work
Build It Green

A. Problem/ Solution Statement

Problem

A key barrier to home electrification is the potential limits of home and utility infrastructure when adding new electric loads. Panel replacements typically cost several thousand dollars and take weeks to months to implement. Furthermore, significantly increasing peak home electrical demand will lead to significant increases in utility infrastructure, the cost of which is borne by ratepayers. This is particularly important for disadvantaged households that are least able to afford these higher costs. An industry-wide shift in perspective is needed to consider power efficient design (PED) as well as current energy efficiency approaches. While technologies and home electrification strategies exist to adopt PED, they are rarely used due to lack of familiarity for electricians, code authorities and home occupants. Existing design and electrification planning tools provide little to no support for PED.

Solution

The proposed solution is to develop a tool for home electrification that provides recommendations on PEDs including load controls, low power appliances, space saving solutions, and other strategies for power efficient electrification. The Tool ensures compliance with the National Electric Code (NEC) to reduce the perceived risks associated with novel approaches to home electrification. The Tool will provide additional support by guiding users to other resources for executing projects. The Tool's calculation engine will include "AI"-based approaches to identifying optimum recommendations and an API that allows other existing tools and solution providers to leverage the underlying datasets, calculation modules and calculation engine a la carte in their own products and services. The Tool enables PED by standardizing assumptions and calculations, making advanced design decisions easy for inexperienced users, homeowners and industry professionals alike. The Tool will remain free for a minimum of 3 years after the term of the agreement.

B. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Develop a user-friendly tool that offers custom, actionable electrification pathways for single family homes with electrical panels ≤100 amps that:
  - will not unnecessarily increase their panel capacity;
  - will provide equal or better customer satisfaction than electrification current processes;
  - will be at lower cost than if homeowners did not have access to the knowledge available from the Tool;
  - complies with all safety regulations.
- Support homeowners in understanding their electrical panel capacity and ways to minimize the cost of electrification.
- Collaborate with stakeholders to improve the Tool's usability and capabilities, including homeowners, utilities, and contractors.
- Develop a business model and commercialization plan for the Tool.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of lower up-front installation costs, greater electricity reliability, and improved health and safety because the Tool will promote cost-effective electrification planning support, minimize future rate increases from lessening peak demand impacts on the electric grid, and improve indoor air quality through removal of unvented combustion from homes when homes are electrified.

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 developing and validating an easy-to-use Tool that will expand and transform the market for guiding homeowners to adopt cost-effective electrification plans that avoid unnecessary panel upsizing and increased grid loads. The Tool will provide viable, accessible electrification paths for disadvantaged communities that have limited resources to invest in their homes, or to engage in costly and time-consuming planning efforts. The active promotion of power-efficient electrification solutions and planning strategies in the Tool saves costs for homeowners by identifying least-cost electrification pathways that also have potential to reduce energy costs. Costs are also reduced for all ratepayers because the Tool supports solutions that help avoid upstream investments needed for electrical grid upgrades. The Tool will remove major bottlenecks in the delivery of residential electrification and will facilitate lower-cost, faster, power-efficient and equitable solutions.

Agreement Objectives

The objectives of this Agreement are to:

- Develop a power-efficient electrification Tool that includes but is not limited to: a user-friendly interface, an energy usage calculator, integration of smart meter data, evaluation of electrification pathways, and cost-effective appliance recommendations.
- Analyze 25+ single family homes that previously upsized their electrical service panel and assess whether the upsized panels were necessary for electrification.
- Analyze 100+ single family homes with electrical panels ≤100 amps to create a baseline understanding of how homes across California use energy for the development of the Tool.
- Apply the Tool to 50 of the 100+ homes and implement the electrification recommendations from the Tool.
- Quantify the accuracy of the Tool's energy and cost estimates compared to the actual 50 homes metered results.
- Assess customer satisfaction with the Tool's electrification pathway recommendations and how they align with the customer needs.
- Assess customer satisfaction with the Tool's user-interface and capabilities.

III. TASK 1 GENERAL PROJECT TASKS

[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] California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

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:

<u>For products that require a draft version, including the Final Report Outline and Final Report</u>

- 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.

<u>For products that require a final version only</u>

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

<u>For all products</u>

- <u>Products will only include aggregate, anonymized data. Recipient shall not disclose any specific or detailed data, or confidential information in Products.</u>
- Submit all data and documents required as products in accordance with the following:

<u>Instructions for Submitting Electronic Files and Developing Software</u>:

- **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, and other CEC staff relevant to the Agreement. The Recipient's Project Manager and any other individuals deemed necessary by the CAM or the Project Manager shall participate in 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., Teams, Zoom), with approval of the CAM.

  The Kick-off meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Travel;
  - Equipment purchases;

- Administrative and Technical products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Monthly Calls (subtask 1.5)
- Quarterly Progress reports (subtask 1.6)
- Final Report (subtask 1.7)
- Match funds (subtask 1.8);
- Permit documentation (subtask 1.9);
- Subawards(subtask 1.10);
- Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
- Agreement changes;
- Performance Evaluations; 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 may 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 may 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. A determination of unsatisfactory progress This may result in project delays, including a potential Stop Work Order, while the CEC determines whether the project should continue.
- 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 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* organized by the tasks in the Agreement.

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

MONTHLY CALLS, REPORTS AND INVOICES

Subtask 1.5 Monthly Calls

The goal of this task is to have calls at least monthly between the CAM and Recipient to verify that satisfactory and continued progress is made towards achieving the objectives of this Agreement on time and within budget.

The objectives of this task are to verbally summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, to verify match funds are being proportionally spent concurrently or in advance of CEC funds or are being spent in accordance with an approved Match Funding Spending Plan, to form the basis for determining whether invoices are consistent with work performed, and to answer any other questions from the CAM. Monthly calls might not be held on those months when a quarterly progress report is submitted or the CAM determines that a monthly call is unnecessary.

The CAM shall:
- Schedule monthly calls.
- Provide questions to the Recipient prior to the monthly call.
- Provide call summary notes to Recipient of items discussed during call.

The Recipient shall:
- Review the questions provided by CAM prior to the monthly call
- Provide verbal answers to the CAM during the call.

Product:
- Email to CAM concurring with call summary notes.

Subtask 1.6 Quarterly 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 *Quarterly 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 reporting period, 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. Progress reports are due to the CAM the 10th day of each January, April, July, and October. The Quarterly Progress Report template can be found on the ECAMS Resources webpage available at: https://www.energy.ca.gov/media/4691
- Submit a monthly or quarterly *Invoice* on the invoice template(s) provided by the CAM.

Recipient Products:
- Quarterly Progress Reports
- Invoices

CAM Product:
- Invoice template

Subtask 1.7 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 1.7.1 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 Products:
- Energy Commission Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.7.2 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 on Draft Final Report* 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 not 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 on Draft Final Report
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- Final Report

CAM Product:
- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBAWARDS

Subtask 1.8 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. 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 application 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 application 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 1.9 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 1.10 Subawards
The goals of this subtask are to: (1) procure subawards required to carry out the tasks under this Agreement; and (2) ensure that the subawards are consistent with the terms and conditions of this Agreement.

The Recipient shall:
- Manage and coordinate subrecipients activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subaward.
- Include any required Energy Commission flow-down provisions in each subaward, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subaward terms.
- If requested by the CAM, submit a draft of each *Subaward* required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed subaward.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding of subrecipient additions in the terms and conditions).

Products:
- Subawards *(if requested by the CAM)*

TECHNICAL ADVISORY COMMITTEE

Subtask 1.11 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 1.12.
- 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 1.12 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 1.13 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 section of 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

IV. TECHNICAL TASKS

*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. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.*

TASK 2 POWER EFFICIENT ELECTRIFICATION SOLUTIONS

The goal of this task is to summarize the state of the art in power efficient technologies and strategies to be included in the Tool and create a resource for the home demonstrations.

The Recipient shall:

- Identify, review, and compare existing power efficient appliances, control devices, calculation tools, and power optimization solutions that help homes remain on their existing panel.
- Prepare a *Power Efficient Management Report* which summarizes the existing power efficient appliances, control devices, calculation tools, and power optimization solutions that help homes remain on their existing panel,to be used as reference for developing the Tool and planning the home demonstrations.

Products:

- Power Efficient Management Report

TASK 3 PAST UPSIZED HOMES ANALYSIS

The goals of this task are to recruit 25 or more single-family homes, or a number of homes that has written approval by CAM, across all three IOUs' (PG&E, SCE, and SDG&E) across different climate zones that previously upsized their electrical panels from ≤100 amps to 200 amps, to assess whether these homes' increased panel capacity could have been avoided for electrification, and to use this assessment to inform the Tool development and home demonstrations.

The Recipient shall:

- Develop a sampling plan to identify a diverse pool of 25 or more single family homes that have upsized their electrical service panels for electrification across all three IOU service territories and across different climate zones.
  - All project sites must be existing homes, must result in negligible or no expansion of existing or former use, and must only involve minor alterations to the structure.
- Identify, measure, and collect energy consumption and energy demand data on all appliances (gas and electric) from these homes with an upsized panel.
- Recruit homes with upsized panels that meet with the sampling plan guidelines.
- Analyze pre and post energy consumption, and demand data of the recent electrification projects that led to panel upsize to determine impacts on branch circuits, circuit breakers, main breaker, total panel loads, and total costs to homeowners.
- Assess the panel load impacts of the recruited homes using NEC 220.83(B) and NEC 220.87 to evaluate whether these homes could have avoided increasing their panel capacity for electrification through deployment of efficient electrical appliances, control devices, management systems and control strategies found in the Power Efficient Management Report.
- Estimate the avoided cost to the grid distribution system in California if residential customers can partially or fully electrify their homes without the need for electric service panel upsize. Include back up documentation for assumptions used in the estimation.
- Prepare an *Upsized Homes Panel Loads Assessment Report* that summarizes the homes recruited, their key data characteristics, and the panel assessment of whether their past panel upsizing could have been avoided.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Upsized Homes Panel Loads Assessment Report
- CPR Report #1

TASK 4 COMMUNITY ADVISORY BOARD

The goal of this task is to engage early and often with stakeholders from local communities, IOUs and others to elicit input on the study's design and to encourage participation and co-production of knowledge through ground truth measurement and/or crowd-sourced information to help validate data and analysis. We will provide timely sharing of preliminary data and findings through public meetings and our web portal.

The Recipient shall:

- Hold community meetings and empanel a dedicated project focused "Community Advisory Board" (CAB) within the study area(s).
- Develop and distribute informational materials to communicate and discuss study results.
- Encourage resident and interested community members to identify additional information, opportunities and locations that will advance the research goals of the project.
- Prepare a *Community Engagement Effort Report* summarizing the findings, feedback, and co-production of knowledge from the CAB meetings, as well as, documenting the

engagement efforts undertaken, at the conclusion of the project to be added to the Project's final report.

Products:
- Community Engagement Effort Report

TASK 5 FIELD STUDY - HOME ELECTRICAL LOAD ANALYSIS

The goals of this task are to analyze data acquired through recruitment of 100 or more single-family homes or a number of homes with written approval from CAM with electrical service panel sizes of ≤100 amps across the three IOUs' service territory, to provide assessments of these homes' existing energy load and remaining capacity for future electrification, and to use this assessment to inform the Tool development and demonstration projects.

The Recipient shall:
- Develop a *100+ Homes Sampling Plan* to identify a diverse pool of 100 or more single family homes with electrical service panel sizes of ≤100 amps across the three IOU service territories that have both heating and cooling loads and are currently using both gas and electric appliances.
    - All project sites must be existing homes, must result in negligible or no expansion of existing or former use, and must only involve minor alterations to the structure.
- Receive feedback on the Sampling Plan from the Technical Advisory Committee and Community Advisory Board and incorporate changes.
- Design a remote data collection methodology to maximize the number of homes that can be studied through the project.
- Develop a Participant Agreement to inform homeowners about the data collection process.
- Submit the Participant Agreement template to the CAM for review.
- Recruit 100 or more homes that meet with the 100+ Homes Sampling Plan guidelines.
- Obtain data to understand the homes' energy usage, peak loads, and electrification infrastructure and needs.
- Analyze energy and peak load data to determine the remaining capacity in the homes for electrification.
- Prepare a *100+ Homes Electrical Load Analysis Report* that documents the data collection methodology, recruitment process, the 100+ homes' data characteristics, and the panel assessment of remaining capacity in these homes for electrification.
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:
- Participant Agreement template
- 100+ Homes Sampling Plan
- 100+ Homes Electrical Load Analysis Report
- CPR Report #2

TASK 6 PANEL OPTIMIZATION DECISION ENGINE

The goal of this task is to develop open-source calculation modules and supporting data tables, an integrated panel optimization decision engine, and an API, that together minimizes panel and service upsizing during home electrification upgrades, retains compliance with extant electric code requirements, and minimizes infrastructure costs.

The Recipient shall:

- Establish framework for developing the calculation modules and decision engine for low-power home electrification.
- Develop draft versions of the calculation modules and supporting data tables.
- Develop draft version of a fully-integrated panel optimization decision engine that leverages the draft calculation modules and supportive tables.
- Conduct stakeholder review meetings to solicit feedback on the calculation modules, supporting data tables, and fully integrated decision engine.
- Refine and produce the final versions for the calculation modules, supportive data tables, and fully integrated decision engine by incorporating the:
    - Feedback provided during the stakeholder review meetings; and
    - Evaluation collected during the field demonstration of the Tool.
- Create a web-based *Panel Optimization Application Programming Interface (API)* for the decision engine allowing third parties to use the calculation engine and supporting modules via API integrations.
- Create a web-based *Panel Optimization Git Repository* archive with instructional materials and source code for the final versions of the calculation modules, supportive data tables, and fully integrated decision engine.
- Prepare a *Decision Engine Report* that documents the decision engine background, framework, calculation modules and methods.

Products:

- Panel Optimization Application Programming Interface
- Panel Optimization Git Repository
- Decision Engine Report

TASK 7 PANEL OPTIMIZATION TOOL UI DEVELOPMENT

The goals of this task are to develop an open-source, user-friendly, web-based user interface (UI) to the integrated calculation engine from Task 6. The Tool UI will allow single family homeowners, contractors, and similar users to easily discover cost-effective electrification pathways that avoid unnecessary panel upsizing.

The Recipient shall:

- Develop “user personas” and “jobs to be done” that will act as reference points for designing the Tool UI.
- Design the specification for the Tool UI that drafts its functional requirements, the user experience (UX) flow, and the rough UI wireframes.
- Conduct user research to refine the UX and the UI.
- Research and select architectural patterns and software platform to be used to code the Tool UI.
- Design graphical assets, as needed, for the Tool UI.
- Code the draft Tool UI.

- Launch the *Panel Optimization Tool UI Web Platform* to be used in Task 8 for the field demonstration of the Tool.
- Hold stakeholder review meetings to gather feedback on the draft Tool UI.
- Revise “jobs to be done”, UX flow, UI, graphical assets, and functional requirements, based on stakeholder feedback and evaluation collected during the field demonstrations.
- Code the final Tool UI.
- Create a web-based *Panel Optimization Tool UI Git Repository* archive with the source code for the final version of the Tool UI, graphical assets, and documentation for deploying and maintaining the code.
- Prepare a *Panel Optimization Tool UI Report* that documents the tool UI background, research conducted, and design methods.

Products:
- Panel Optimization Tool UI Web Platform
- Panel Optimization Tool UI Git Repository
- Panel Optimization Tool UI Report

TASK 8 FIELD DEMONSTRATION WITH PANEL OPTIMIZATION TOOL

The goals of this task are to evaluate the Tool’s performance by demonstrating it in at least 50 homes or a number of homes with written approval from CAM from the 100+ homes recruited in Task 5 and evaluate the costs, user experience, and load impacts from implementing the Tool’s recommended electrification solutions in these homes.

The Recipient shall:
- Develop a *50+ Demonstration Homes Sampling Plan* to identify a strategic pool of 50 or more demonstration homes from the 100+ homes recruited in Task 5.
  - All project sites must be existing homes, must result in negligible or no expansion of existing or former use, and must only involve minor alterations to the structure.
- Receive feedback on the Sampling Plan from the Technical Advisory Committee and Community Advisory Board and incorporate changes.
- Develop the resources for working at the demonstration homes that includes:
  - A customer engagement support plan.
  - A Customer Agreement to inform homeowners about the electrification and data collection process.
  - Research and recruitment protocols submitted to the Institutional Review Board for evaluation and requirements for human subjects’ research. A subrecipient is required to follow protocols comply with the Institutional Review Board. This project’s research falls under consideration of human subjects’ research. This is standard operating procedures with research institutions.
  - A monitoring and verification methodology and data collection plan.
  - A Customer Participation Agreement that outlines the roles and responsibilities of the parties including remedies in case of non-working solutions.
- Submit copies of the template Customer Agreement and Customer Participation Agreement to the CAM for review.
- Recruit 50 or more homes that meet the 50+ Homes Sampling Plan guidelines and use the Tool to develop cost-effective electrification plans.
- Implement each recruited home’s electrification plan and monitor the load profiles and performance of the installed electrical appliances and devices.

- Evaluate the realized panel load impacts and electrification costs of the recruited homes compared to the predictions made by the Tool.
- Characterize the energy and non-energy benefits attributed to deploying the Tool.
- Prepare a *50+ Demonstration Homes Report* that documents the homes recruited, the electrification journeys using the Tool, the realized panel load impacts and electrification costs, and the energy and non-energy benefits analysis.

Products:
- Customer Agreement template
- Customer Participation Agreement template
- 50+ Demonstration Homes Sampling Plan
- 50+ Demonstration Homes Report

TASK 9 BUSINESS MODEL AND COMMERCIALIZATION PLAN

The goal of this task is to develop a viable, actionable plan to commercialize the Tool. We will conduct activities, training, and outreach to lay the groundwork and test our business model to enable the Tool to be free and accessible to all CA ratepayers.

The Recipient shall:
- Conduct training of Tool usage to inform the preparation of the *Tool Deployment Business Plan*
- Develop a *Tool Deployment Business Plan* that includes but is not limited to an outline of
  - Key stakeholders groups to engage
  - Pathways for stakeholder involvement for Tool usage and adoption
  - Relevant programs and policies to leverage
  - Business opportunities within stakeholder groups, programs, and policies
  - Continuous improvement and revenue model
  - Workforce development and program integration plan
- Solicit and support Tool integration with existing software providers to demonstrate product quality, desired performance, and commercial viability.
- Prepare a *User Awareness Campaign Report* that documents the process, results, and lessons learned from implementing the Tool Deployment Business Plan during the course of the project.

Products:
- Tool Deployment Business Plan
- User Awareness Campaign Report

TASK 10 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 January 31st 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 11 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to ensure the technological learning that resulted from the demonstration(s) is captured and disseminated to the range of professions that will be responsible for future deployments of this technology or similar technologies.

The Recipient Shall:
- Develop and submit a *Project Case Study Plan* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The Project Case Study Plan should include:
  - An outline of the objectives, goals, and activities of the case study.
  - The organization that will be conducting the case study and the plan for conducting it.
  - A list of professions and practitioners involved in the technology's deployment.
  - Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
  - Presentations/webinars/training events to disseminate the results of the case study.
- Present the draft *Project Case Study Plan* to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the draft *Project Case Study Plan*. This document will identify:
  - TAC comments the Recipient proposes to incorporate into the final *Technology Transfer Plan*.
  - TAC comments the Recipient does not propose to incorporate with and explanation why.

- Submit the final *Project Case Study Plan* to the CAM for approval.
- Execute the final Project Case Study Plan and develop and submit a Project Case Study.
- When directed by the CAM, develop presentation materials for a 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:

- Project Case Study Plan (draft and final)
- Summary of TAC Comments
- Project Case Study (draft and final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.