

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

New Agreement EPC-15-053 (To be completed by CGL Office)

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

| Recipient's Legal Name | Federal ID Number |
|--|-------------------|
| Electric Power Research Institute, Inc | 23-7175375 |

| Title of Project |
|---|
| Customer-Centric Approach to Scaling Integrated Demand Side Management (IDSM) Retrofits |

| Term and Amount | Start Date | End Date | Amount |
|-----------------|------------|-----------|--------------|
| | 6/30/2016 | 3/31/2020 | \$ 3,894,721 |

Business Meeting Information
 ARFVTP agreements under \$75K delegated to Executive Director.

| | | | |
|--------------------------------|-----------|----------------------------------|--|
| Proposed Business Meeting Date | 5/17/2016 | <input type="checkbox"/> Consent | <input checked="" type="checkbox"/> Discussion |
|--------------------------------|-----------|----------------------------------|--|

| | | | |
|----------------------------|------------------|--------------|-----------|
| Business Meeting Presenter | Felix Villanueva | Time Needed: | 5 minutes |
|----------------------------|------------------|--------------|-----------|

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

Agenda Item Subject and Description

ELECTRIC POWER RESEARCH INSTITUTE, INC. Proposed resolution approving agreement EPC-15-053 with Electric Power Research Institute, Inc. for a \$3,894,721.00 grant to develop and demonstrate an innovative approach for energy efficiency retrofits in multi-family disadvantaged communities that uses a customer-centric instead of a technology-centric approach.

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)):

2. If Agreement is considered a "Project" under CEQA:

a) Agreement **IS** exempt. (Attach draft NOE)

Statutory Exemption. List PRC and/or CCR section number: PRC 21080.35

Categorical Exemption. List CCR section number: Cal. Code Regs., tit 14, § 15301

Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section:

The activities funded by this agreement are exempt under Cal. Code Regs., tit. 14, § 15301 because they involve minor energy efficiency retrofit alterations to existing apartment buildings. The retrofits involve no expansion of existing use, with interior/exterior alterations to improve building performance. The retrofit project may also include solar thermal water heating, which is exempt under Public Resources Code section 21080.35, providing for installation of solar energy systems, including solar-heated water.

In addition, EPRI, Inc. may also install carport solar energy systems at its own expense, as part of a related project. The carport solar is exempt under Public Resources Code section 21080.35. The addition of the carport solar energy system to the other retrofits does not cause a cumulative impact that would raise an exception to the CEQA exemptions. Cal. Code Regs., tit. 14, § 15300.2

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

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

| Legal Company Name: | Budget |
|--|------------|
| BIRAenergy | \$ 403,058 |
| The Regents of the University of California, Davis-Western Cooling | \$ 528,000 |
| Itron, Inc. | \$ 271,619 |
| LINC Housing Corporation | \$ 519,916 |
| A.Y. Ahmed | \$ 70,000 |

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| | |
|-------------------------------|-----------|
| Karl Johnson Consulting | \$ 99,001 |
| Clean Energy Group | \$ 68,000 |
| byVava | \$ 80,000 |
| Primus Building Solutions LLC | \$ 50,000 |
| Proteus, Inc. | \$ 95,000 |
| KJI Plumbing | \$ 30,000 |
| Promise Energy | \$ 90,000 |
| Optima Energy | \$ 30,000 |
| Airthane | \$ 50,000 |

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

Legal Company Name:

Budget Information

| Funding Source | Funding Year of Appropriation | Budget List No. | Amount |
|-----------------------------------|-------------------------------|----------------------|-------------|
| EPIC | 14-15 | 301.001B | \$3,894,721 |
| R&D Program Area: EERO: Buildings | | TOTAL: | \$3,894,721 |
| Explanation for "Other" selection | | | |
| Reimbursement Contract #: | | Federal Agreement #: | |

Recipient's Administrator/ Officer

| | | | |
|-------------------|--------------------------|-------------------|--------------------------|
| Name: | David Morrison | Name: | Andra Rogers |
| Address: | 942 Corridor Park Blvd | Address: | 3420 HILLVIEW AVE |
| City, State, Zip: | Knoxville, TN 37932-3723 | City, State, Zip: | PALO ALTO, CA 94304-1355 |
| Phone: | 865-218-8104 / Fax: - - | Phone: | 650-855-2101 / Fax: - - |
| E-Mail: | dmorriso@epri.com | E-Mail: | arogers@epri.com |

Selection Process Used

- Competitive Solicitation Solicitation #: GFO-15-308
 First Come First Served Solicitation

The following items should be attached to this GRF

- | | | |
|---|---|--|
| 1. Exhibit A, Scope of Work | <input checked="" type="checkbox"/> | Attached |
| 2. Exhibit B, Budget Detail | <input checked="" type="checkbox"/> | Attached |
| 3. CEC 105, Questionnaire for Identifying Conflicts | <input checked="" type="checkbox"/> | Attached |
| 4. Recipient Resolution | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Attached |
| 5. CEQA Documentation | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> Attached |

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

Exhibit A Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

| Task # | CPR ¹ | Task Name |
|--------|------------------|--|
| 1 | | General Project Tasks |
| 2 | X | Development of Energy Efficiency Pools and Efficient Retrofit Packages |
| 3 | X | Construction, Implementation, and Commissioning of Efficient Retrofit Packages |
| 4 | | Data Acquisition, Monitoring, Analysis, and Customer Education and Training |
| 5 | | Evaluation of Project Benefits |
| 6 | | Technology/Knowledge Transfer Activities |

B. Acronym/Term List

| Acronym/Term | Meaning |
|--------------|--|
| CAM | Commission Agreement Manager |
| CAO | Commission Agreement Officer |
| CPR | Critical Project Review |
| CPUC | California Public Utilities Commission |
| DR | Demand Response |
| ERP | Efficient Retrofit Package |
| IDSM | Integrated Demand Side Management |
| MASH | Multifamily Affordable Solar Housing |
| M&V | Measurement and Verification |
| PV | Photovoltaic |
| TAC | Technical Advisory Committee |
| ZNE | Zero-Net Energy |

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

A. Purpose of Agreement

The purpose of this Agreement is to develop and demonstrate an innovative approach to scale residential retrofits using efficient retrofit packages (ERPs) for disadvantaged communities that are a hybrid of traditional technology-centric and customer-centric approaches. The goal is to develop retrofit solutions that match technologies to occupant preference, behavior, and are minimally intrusive.

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

B. Problem/ Solution Statement

Problem

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) seeks to double the energy efficiency of existing buildings' energy use by 2030. Disadvantaged, low-income multifamily communities are one of the most important retrofit targets, yet have no cost-effective pathways to achieve these goals. Multifamily housing is a very difficult market segment to address due to split incentives as retrofits are the responsibility of a property owner but often he/she does not pay the energy bill.

Solution

The recipient will demonstrate how to scale energy efficiency in existing buildings with engaged occupants and targeted ERPs that reduce the cost of up-front audits and calibration, while enabling energy efficiency contractors to accomplish retrofits at scale. The recipient will leverage lessons learned from how solar photovoltaic (PV) scaled up through a combination of standardization, replication, and guaranteed results and without encroaching inside the home, which could create occupant barriers.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

1. Demonstrate how retrofits can be scaled with an “occupant first” approach to help drive down costs for efficiency providers and make retrofits cost-effective where the energy savings far exceeds the program measure costs.
2. Develop and demonstrate ERPs that can be minimally intrusive to occupants, while maximizing energy efficiency benefits. Measure occupant experience with energy efficiency retrofits that can lead to improved cost-effectiveness and overall technical and behavioral performance.
3. Establish measurement and verification (M&V) models that can lead to “pay-for-performance” for energy efficiency using data at the individual level. Also, accurately estimate carbon impacts of energy efficiency.
4. Demonstrate how various types of distributed energy resources including solar, energy efficiency, and demand response can be integrated with the electric grid.

Ratepayer Benefits:² This Agreement will result in the following ratepayer benefits:

- Greater Electricity Reliability. This project will provide new data, analysis, and designs for cost effective ERPs to disadvantaged communities, which will improve the reliability with the integration of energy efficiency, demand control, and renewable power with buildings and the smart grid.

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 (CPUC), 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).

Exhibit A Scope of Work

- Lower Costs. Significant savings in money, resources, operation and maintenance, energy, and greenhouse gases are available. Both ratepayers and customers benefit by having savings from implementing zero-net energy (ZNE) residential communities.
- Increased Safety. Disadvantaged communities have the potential to increase safety due to the improved ability to control and integrate buildings' use of renewable power, storage, electric vehicle charging, and the smart grid. In addition, many of the networked ZNE technologies have additional monitoring and safety features that identify malfunctions, overheating and failures of these technologies.

Technological Advancement and Breakthroughs:³ This Agreement will help California to meet the 2030 retrofit goal and utilities progress towards enabling SB 350, which requires doubling energy efficiency in existing homes by 2030, using defined ERPs. The project will also implement and evaluate monitoring systems and techniques that could enable the “pay-for-performance” using the baseline for efficiency evaluation to be the actual performance of homes, and not the code minimum. Finally, the project will also demonstrate how a combination of energy efficiency, demand response, PV panels and storage can be used to reduce overall energy and meet the renewable and energy use requirements for SB 350.

Agreement Objectives

This Agreement's objectives are to:

- Design and develop ERPs: The ERPs will be a combination of measures such as roof insulation for placement of ducts in conditioned space, appliance upgrades (refrigerators, ranges), patio doors, weather-stripping, hot water pipe line insulation, and PV.
- Construct, implement and commission of ERPs: During this phase, the recipient will work with both property managers and occupants to implement the energy efficiency measures developed in the first technical task.
- Acquire data, monitor and analyze: This task will begin from the start of the project to plan the data monitoring systems and pilot design.
- Develop the Integrated Demand Side Management (IDSM) Retrofit Guidelines: This guideline is for residences in low-income communities showing pathways to reaching ZNE goals.

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)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the

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.

Exhibit A Scope of Work

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 Energy Commission’s 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 or CD-ROM.

The following describes the accepted formats for electronic data and documents provided to the Energy Commission 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.
- Documents intended for public distribution will be in PDF file format.
- The Recipient must also provide the native Microsoft file format.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

Exhibit A Scope of Work

○ **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 Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

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

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission 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;
- 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);

Exhibit A Scope of Work

- Progress reports and invoices (subtask 1.5);
 - Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, 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:

- Updated Project Schedule (*if applicable*)
- Updated List of Match Funds (*if applicable*)
- Updated List of Permits (*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 Energy Commission 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 Energy Commission 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 Energy Commission.

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 Energy Commission, 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 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.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

Exhibit A Scope of Work

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and 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)
- Task Products (draft and/or final as specified in the task)

CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- 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 Energy Commission 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 state-owned equipment.
 - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
 - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).

Exhibit A Scope of Work

- 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 *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written 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 Fund and in-state expenditures.

Products:

- Progress Reports
- Invoices

Exhibit A Scope of Work

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. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the 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 *Style Manual* provided by the CAM. (See Task 1.1 for requirements for draft and final products.)

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- 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, 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.)

Exhibit A Scope of Work

- Attachments (if applicable)
 - Ensure that the document is written in the third person.
 - Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
 - Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
 - Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
 - Include a brief description of the project results in the Abstract.
-
- 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
 - Consider incorporating all CAM comments into the Final Report. 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 Final Report 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.
 - Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft 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 Energy Commission 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.

Exhibit A Scope of Work

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 Energy Commission 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 Energy Commission 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.
 - A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

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

Exhibit A Scope of Work

- 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 the 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,

Exhibit A Scope of Work

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.

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

Exhibit A Scope of Work

Subtask 1.11 TAC Meetings

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

The Recipient shall:

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

Products:

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

IV. TECHNICAL TASKS

All deliverables and products submitted will not contain any confidential information. All resident information will be masked and aggregated and will comply with the requirements of the Special Terms and Conditions for reporting of personal information.

TASK 2: DEVELOPMENT OF ENERGY EFFICIENCY POOLS AND EFFICIENT RETROFIT PACKAGES

The goals of this task are to recruit participants and identify efficient retrofit packages.

The Recipient shall:

- Develop Building energy models and audit in EnergyPlus, compatible with California Building Energy Code Compliance software.
- Provide *Building Energy Models* which includes models in EnergyPlus that detail the data and analysis of energy efficient measures and packages.
- Report on actual energy use, Title 24 2016 compliance and PV sizing at the individual home, community center and community scale.
- Design participant recruitment and incentive packages.
- Recruit pilot participants for approximately 40 to 60 living units in four to eight multi-family residential buildings.
- Sites Chosen at the commencement of this agreement are: Seasons Senior Apartments in Ontario, CA and the Pleasant View Apartments in Fresno, CA. For any changes in site

Exhibit A Scope of Work

location, the Recipient must check with the CAM or CAO, who will provide guidance regarding the level of commission approval required.

- Develop and provide a *Pilot Recruitment Summary Report* which includes the recruitment information, education, incentives, initial community survey questions and results summary. This will also include the data and analysis to identify high potential pools of participants for the “occupant first” IDSM approach.
- Design ERPs – design two to four ERPs for the residential units and ERPs for the community center (common area/multi-purpose room) for each of the two demonstration communities identified above. The design plan includes the number of ERPs (2 to 4), the number of units per ERP, location of different ERPs for residential units in the two communities, ERPs for two community centers.
- Develop and provide an *Efficient Retrofit Packages Report*, which includes the behavioral and technical analysis and the development of two to four IDSM ERPs and the ERPs for the two community centers for pilot testing. The type of retrofits that will be considered, based on input from residents, include: High efficiency windows and doors, high efficiency HVAC with DR, LED lights, roof insulation, high efficiency refrigerator, smart thermostats and community solar water heating. Retrofits may also include solar PV and battery storage (match funding) with community supervisory control system for ZNE utility management if economically feasible.
- Based on the energy audits and modeling there will be an implementation of the resulting cost effective measure (see task 3).
- The recipient may collect personal information from residents and must adhere to the requirements in the Special Terms and Conditions.
- Participate in a CPR meeting and prepare *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).

Products:

- Building Energy Models
- Pilot Recruitment Summary Report
- Efficient Retrofit Packages Report
- CPR Report #1

TASK 3: CONSTRUCTION, IMPLEMENTATION, AND COMMISSIONING OF EFFICIENT RETROFIT PACKAGES

The goals of this task are to work with property managers and pilot participants to implement ERPs.

The Recipient shall:

- Conduct an initial meeting and provide education and training materials for property managers.
- Work with construction manager on project schedule, required permits and implementation of ERPs.
- Develop and provide *Construction Project Schedule* which includes the schedule for the final ERP specifications, procurement of materials, installation for residential and community center ERPs, installation of supervisory controls, storage and community PV with MASH for utility and DR control.

Exhibit A Scope of Work

- Develop and provide *Commissioning Plan for ERPs* which will detail the commissioning plan for the residential and community center ERPs.
- Install residential and community center ERPs.
- Commission ERPs.
- Commission and test the storage, community PV with MASH, DR and supervisory control system.
- Monitor commissioning of ERPs to ensure compliance with construction and commissioning plans.
- Develop and prepare *Construction Field Report* which includes the lessons learned from the design and installation of the different ERPs.
- Develop and prepare *Supervisory Controls Commissioning Plan* which details the commissioning, training and ongoing monitoring based commissioning plan for the supervisory controls.
- Develop and prepare *Customer Survey Reports* which includes the three surveys and ongoing feedback from the participants, non-participants (those not receiving efficiency upgrades/control group) and community management for up to 3 months after the ERPs have been installed.
- Participate in a CPR meeting and prepare CPR Report #2 in accordance with subtask 1.3 (CPR Meetings).

Products:

- Construction Project Schedule
- Commissioning Plan for ERPs
- Construction Field Report (draft and final)
- Supervisory Controls Commissioning Plan
- Customer Survey Reports (draft and final)
- CPR Report #2

TASK 4: DATA ACQUISITION, MONITORING, ANALYSIS, AND CUSTOMER EDUCATION AND TRAINING

The goals of this task are to conduct data acquisition, monitoring, and analysis and provide customer education and training opportunities after ERP and supervisory controls commissioning.

The Recipient shall:

- Develop and provide a *Data Acquisition and Analysis Plan*, which includes data from smart meters, AMI, energy use by end-use loads, indoor temperature and air quality. PV with MASH, battery storage and supervisory controls.
- Collect data over a two year period and prepare a *Data Acquisition Monitoring Report* to include data from smart meters, end-use loads, indoor temperature and air quality. PV with MASH, battery storage, supervisory controls and specific measurements of energy use by each ERP. The report will show how this data can be used for a potential “pay-for-performance” program, ongoing monitoring based commissioning and management of the ERPs and community utility management.
- Conduct data quality checks to ensure proper data collection and provide ongoing feedback to the technical and behavioral performance of the ERPs.

Exhibit A Scope of Work

- Provide continuous engagement opportunities to occupants via open houses, training sessions, and workshops.
- Conduct surveys of pilot participants during the ERP commissioning process.
- Develop and provide *Customer Feedback Survey Reports* which include the before, during and after surveys as well as a summary of the customer and management feedback on the project (draft and final).
- Develop and prepare *IDSM Retrofit Guidelines for Residences in Low-Income Communities* which will detail how to replicate and scale the two to four customer centric based ERPs, provide performance guidelines for design, installation, commissioning and monitoring of the ERPs, how to use existing programs for ERPs (such as On-Bill financing and Energy Upgrade California) and new pay-for-performance models.

Products:

- Data Acquisition and Analysis Plan (draft and final)
- Data Acquisition Monitoring Report (draft and final)
- Customer Feedback Survey Reports (draft and final)
- IDSM Retrofit Guidelines for Residences in Low-Income Communities (draft and final)

TASK 5: EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:
 - For Product Development Projects and Project Demonstrations:
 - Published documents, including date, title, and periodical name.
 - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
 - Greenhouse gas and criteria emissions reductions.
 - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.

Exhibit A Scope of Work

- Additional Information for Product Development Projects:
 - Outcome of product development efforts, such copyrights and license agreements.
 - Units sold or projected to be sold in California and outside of California.
 - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
 - Investment dollars/follow-on private funding as a result of Energy Commission funding.
 - Patent numbers and applications, along with dates and brief descriptions.
- Additional Information for Product Demonstrations:
 - Outcome of demonstrations and status of technology.
 - Number of similar installations.
 - Jobs created/retained as a result of the Agreement.
- For Information/Tools and Other Research Studies:
 - Outcome of project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.
 - An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
 - An estimate of energy and non-energy benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

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

Products:

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

TASK 6: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

Exhibit A Scope of Work

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
 - A description of the intended use(s) for and users of the project results.
 - Published documents, including date, title, and periodical name.
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
 - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
 - The number of website downloads or public requests for project results.
 - Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop on the results of the project.
- When directed by the CAM, participate in annual EPIC symposium sponsored by the California Energy Commission.
- Provide at least six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites.
- Provide signed photo waiver release by the California Energy Commission.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Presentation Materials (draft and final)
- High Quality Digital Photographs
- Photo Waiver and Release Form
- Technology/Knowledge Transfer Plan (draft and final)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ELECTRIC POWER RESEARCH INSTITUTE, INC.

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

RESOLVED, that the Energy Commission approves Agreement EPC-15-053 from GFO-15-308 with Electric Power Research Institute, Inc. for a \$3,894,721 grant to to develop and demonstrate an innovative approach for energy efficiency retrofits in multi-family buildings in disadvantaged communities that uses a customer-centric instead of a technology-centric approach. The project locations are Central and Southern California; and

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

CERTIFICATION

The undersigned Secretariat to the Commission 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 California Energy Commission held on May 17, 2016.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat