

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

New Agreement EPC-18-013 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
ERDD	Michael Ferreira	51	916-445-5281

Recipient's Legal Name	Federal ID Number
The Regents of the University of California, on behalf of the Berkeley campus	94-6002123

Title of Project
The Oakland EcoBlock, Phase II: A Zero Net Energy, Low Water-Use Retrofit Neighborhood

Term and Amount	Start Date	End Date	Amount
	6/28/2019	5/30/2023	\$ 5,000,000

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

Proposed Business Meeting Date	6/12/2019	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
--------------------------------	-----------	----------------------------------	--

Business Meeting Presenter	James Friedrich	Time Needed:	5 minutes
----------------------------	-----------------	--------------	-----------

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

Agenda Item Subject and Description

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, ON BEHALF OF THE BERKELEY CAMPUS. Proposed resolution approving Agreement EPC-18-013 with the Regents of the University of California on behalf of the Berkeley campus, for a \$5,000,000 grant to deploy a block-scale retrofit development combining deep energy efficiency retrofit strategies, integrated distributed energy generation systems, and water conservation and capture systems in a low-to-middle income neighborhood in the City of Oakland, and adopting staff's determination that this action is exempt from CEQA. (EPIC Funding) Contact: James Friedrich. (Staff presentation: 5 minutes)



California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
 Yes (skip to question 2) No (complete the following (PRC 21065 and 14 CCR 15378)):
 Explain why Agreement is not considered a "Project":
 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:
 a) Agreement **IS** exempt. (Attach draft NOE)
 Statutory Exemption. List PRC and/or CCR section number: _____

Categorical Exemption. List CCR section number: Cal. Code Regs., tit 14, § 15301 ; Cal. Code Regs., tit 14, § 15303

Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section:

Cal. Code Regs., tit 14, § 15301: This categorical exemption applies to projects which consist of operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing structures, facilities, mechanical equipment, or topographical features, which involves negligible or no expansion of use beyond that existing at the time of the lead agency's CEQA determination. This agreement will fund energy and water efficient retrofits, the installation of solar photovoltaic systems and new electrical equipment on existing structures. The only construction outside of the existing structures will be the installation of the EV (Electric Vehicle) chargers, and minor trenching for laying new electrical conduit, pulling wire, refilling trenches and relaying asphalt on top for the microgrid distribution and EV chargers. Trenching would happen in existing concrete areas and utility spaces. These modifications will not result in any expansion of an existing use. For these reasons, the proposed work will not have any significant effect on the environment and falls under section 15301.

Cal. Code Regs., tit 14 § 15303: This categorical exemption applies to projects which consist of construction and location of limited number of new, small facilities or structures; or consist of installation of small new equipment and facilities in small structures; or consist of the conversion of small structures from one use to another where only minor modifications are made in the exterior of the structure. This provides for an exemption as the majority of construction activities, including energy efficiency retrofits, installation of roof mounted photovoltaic systems and new electrical equipment are considered minor alterations to existing structures as they amount to less than 2500 square feet for each structure. New construction activities include the construction and installation of the microgrid distribution system and EV chargers. This also includes trenching and backfilling to place new electrical lines underground. The microgrid distribution system, EV chargers and any other new energy equipment will be the size typically used for commercial buildings which can be categorized as small new equipment. For these reasons, the proposed work will not have any significant effect on the environment and falls under section 15303.

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

- Check all that apply
- | | |
|---|---|
| <input type="checkbox"/> Initial Study | <input type="checkbox"/> Environmental Impact Report |
| <input type="checkbox"/> Negative Declaration | <input type="checkbox"/> Statement of Overriding Considerations |
| <input type="checkbox"/> Mitigated Negative Declaration | |

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

Legal Company Name:	Budget
Spectrum Energy Development, Inc.	\$ 1,000,000
Redhorse Constructors, Inc.	\$ 758,540
Lawrence Berkeley National Laboratory	\$ 648,000
Integral Group, Inc.	\$ 249,954
City of Oakland	\$ 225,004
Page Southerland Page, Inc.	\$ 125,000
Cathy Leonard	\$ 90,000
Build It Green	\$ 84,924
-- See attachment for continuation of list--	\$

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION



List all key partners: (attach additional sheets as necessary)
Legal Company Name:
City of Oakland

Budget Information			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	17-18	301.001E	\$3,740,181
EPIC	18-19	301.001F	\$1,259,819
			\$
			\$
			\$
			\$
R&D Program Area:	EDMFO: EDMF	TOTAL:	\$5,000,000
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer		Recipient's Project Manager	
Name:	Jessie Brown	Name:	Alexandra von Meier
Address:	1608 4Th St Ste 220	Address:	2080 Addison St Fl 2
City, State, Zip:	Berkeley, CA 94710-1749	City, State, Zip:	Berkeley, CA 94720-1601
Phone:	510-642-8120 /	Fax:	- -
E-Mail:	jwbrown@berkeley.edu	E-Mail:	vonmeier@uc-ciee.org

Selection Process Used	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: GFO-15-312
<input type="checkbox"/> 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 checked="" type="checkbox"/> N/A <input type="checkbox"/> Attached

Agreement Manager _____	Date _____	Office Manager _____	Date _____	Deputy Director _____	Date _____
-------------------------	------------	----------------------	------------	-----------------------	------------

EPC-18-013 Additional Subcontractors (major and minor) and equipment vendors

Legal Company Name	Budget
David Taussig and Associates, Inc.	\$ 75,000
Microgrid Labs, Inc.	\$ 75,000
Siegel & Strain Architects	\$ 65,560
Sherwood Design Engineers, Ltd.	\$ 50,000
Anthony Nahas	\$ 49,000
Morgan, Lewis & Bockius LLP	Match Only

Exhibit A Scope of Work

Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Design, Development, and Permitting
3	X	Construction and Commissioning
4		Measurement, Verification, and Proving the Business Case
5		Evaluation of Project Benefits
6		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AC	Alternating-Current
AEC	Advanced Energy Community
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEQA	California Environmental Quality Act
CFD	Community Facilities District
CPR	Critical Project Review
DC	Direct-Current
DER-CAM	Distributed Energy Resources Customer Adoption Model
DERs	Distributed Energy Resources
DR	Demand Response
EE	Energy Efficiency
EV	Electric Vehicle
HVAC	Heating, Ventilation and Air Conditioning
LED	Light Emitting Diode
M&V	Measurement & Verification
PG&E	Pacific Gas & Electric
TAC	Technical Advisory Committee
VMT	Vehicle Miles Traveled

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

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

A. Purpose of Agreement

The purpose of this Agreement is to design, install, operate, and evaluate the Oakland EcoBlock, an Oakland-based neighborhood cluster of single- and multi-family dwellings that will undergo deep energy efficiency retrofits, with an integrated electrical system that includes community-scale solar, a direct current (DC) backbone and a distribution system linking residential buildings, while remaining connected to the PG&E utility grid, advanced flywheel energy storage, electric vehicle (EV) charging stations, a smart microgrid control and management software system that optimizes supply and demand at the block-scale (while encouraging human behavioral demand-response), as well as water efficiency and reuse opportunities.

B. Problem/ Solution Statement

Problem: The adoption of energy efficiency (EE) and distributed energy resources (DERs) in the existing residential building stock is happening at too slow a rate to meet California's aggressive energy and climate goals articulated in AB 32, SB 350, SB 375, SB 1275, and Executive Orders B-30-15 and B-29-15. Several factors are hindering the adoption of these clean-energy technologies: 1) transaction costs inherent in the one-house-at-a-time deployment model, 2) lack of awareness of the benefits of these technologies, particularly in hard-to-reach market segments, and 3) limited access to capital to finance the large capital investments needed for deep energy retrofits with solar and energy storage systems. Moreover, while microgrids are seen as a viable solution to overcome some of these barriers to the deployment of DER in the commercial and industrial sectors, their application in existing residential neighborhoods is seen as infeasible because of institutional and technical barriers.

Solution: The Oakland EcoBlock is a whole-systems urban sustainability project that aims to prototype a pathway to affordable urban decarbonization by means of block-scale retrofitting. The EcoBlock model is designed to be deployed in residential and mixed-use neighborhoods as a holistic process that (1) undertakes deep EE retrofits in buildings, and (2) harnesses local renewable resources to significantly reduce the households' energy, transportation, and water footprint. By aggregating the required design, permitting, financing, and construction work across a block of homes, the EcoBlock concept reduces transaction costs, overcomes information barriers, and allows access to lower-cost financing mechanisms that are not available to individual building owners. Moreover, aggregating the electrical load of an entire block allows the cost-effective construction of a microgrid with shared DERs that further lowers capital costs and improves operational efficiency. The resulting EcoBlock microgrid provides net-negative greenhouse gas emissions and reduces residents' energy bills, while providing grid services and improving local power reliability and quality. If the EcoBlock can be demonstrated to cost-effectively deliver all these benefits, as our preliminary analysis shows it can, it will be a revolutionary advance in achieving California's clean energy goals.

The Recipient will demonstrate the EcoBlock's energy components, a solar-powered microgrid, energy efficiency retrofits, and water and transportation systems sited at a residential neighborhood in Oakland, California. The project will build on the conceptual microgrid design developed in EcoBlock Phase I to pilot the detailed design, permitting, community engagement, and governance processes needed to successfully deploy a renewable microgrid and integrated

Exhibit A Scope of Work

energy efficient buildings and water and transportation systems for a residential block. The technologies used in the EcoBlock are all commercially available but are integrated at a unique scale (the residential urban block) and delivered through a unique process that is designed to be replicable and scalable. Operation of the resulting Oakland EcoBlock will help verify the carbon-reduction capability of this concept, along with the ability of the microgrid to island from the grid using only local generation assets, as well as provide grid services while connected to the grid.

Proving the EcoBlock concept will not only bring benefits to the residents of the Oakland EcoBlock and the investor owned utility customers in the immediate vicinity, but also provide valuable experience for other cities and counties throughout California to use in replicating EcoBlock programs to retrofit their existing residential building stock.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Verify the water, energy, peak load, CO2 savings, VMT reduction, and power reliability improvement potential of the EcoBlock microgrid;
- Test the hypothesis that retrofitting on the block-scale can be more efficient and cost-effective than the individual house-scale to achieve high penetration of energy efficiency retrofits, solar generation, and energy storage within a neighborhood;
- Better understand the opportunities and barriers to wider deployment of EcoBlock microgrids, and to refine the EcoBlock business model developed in the EcoBlock Phase I study;
- Demonstrate the ability to provide at least 8 hours of reliable power to homes within an EcoBlock during a grid outage;
- Demonstrate that smart load management can extend by 50% the duration of reliable power in a grid outage;
- Reduce project capital costs (development, design and construction) by 10% compared to standalone solar and energy storage systems at individual homes;
- Increase the renewable fraction of electricity consumed by an EcoBlock by at least 10% over the course of an average day compared to solar plus energy storage at the individual home level.
- Provide solar-generated electricity for 80% of the annual energy needs for a cluster of EV chargers in an EcoBlock.
- Use the Oakland EcoBlock block-scale test case as a measure of appropriate scale and scalability, by providing the performance data from which to assess whether the concept should be aggregated into multiple blocks to create a larger scale sustainable neighborhood that is even more cost effective.

Ratepayer Benefits:² This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety.

Those benefits are achieved in the following ways:

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).

Exhibit A Scope of Work

Greater Reliability: Reduced electricity consumption and peak demand reduction, achieved by the deep energy retrofits, local storage, and microgrid controller scheme proposed in this project, will avoid reliance on least reliable generation sources at the margin. In addition, the microgrid's ability to island from the grid will protect consumers from grid outages and maximize grid reliability.

Lower Costs: By aggregating the required design, permitting, financing, and construction work across a block of homes, the EcoBlock concept reduces transaction costs, overcomes information barriers, and allows access to lower-cost financing mechanisms that are not available to individual building owners. Moreover, aggregating the electrical load of an entire block allows the cost-effective construction of a microgrid with shared DERs that further lowers capital costs and improves operational efficiency. Overall, thanks to the economies of scale that its collective approach allows, the EcoBlock leads to lower utility bills and other benefits that translate into lower costs for ratepayers. Benefits that are magnified by the block scale nature of the project include the creation of energy use reductions, steep CO₂ reduction (65 percent at the block scale, including VMT), electrification of space heating, hot water heating, reduction of local car trips, and improved indoor air quality for all participants. The water efficiency strategies being demonstrated in this project can also lead to lower costs by reducing the energy needed to purify, deliver, treat, and dispose of water at a block-scale.

Increased Safety: Consumers are safer when more appliances can be switched to locally-generated power during grid outages. More importantly, the microgrid's islanding capabilities enable consumers gain access to critical electrical end uses during outages and potential catastrophic events. Potential ratepayer benefits also include: increased comfort (warmer in winter, cooler in summer) and well-being in the homes due to the thermal shell retrofits. Replacing natural gas appliances for electric ones can also increase safety by reducing the risk of exposure to natural gas leaks and explosions. Electrification of natural gas appliances will also reduce greenhouse gas emissions and lead to improved indoor air quality by means of eliminating indoor natural gas combustion.

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 using a holistic process to block-scale retrofitting of residential and mixed-use neighborhoods. The Oakland EcoBlock (1) undertakes deep efficiency and electrification retrofits in buildings, and (2) harnesses local renewable resources to significantly reduce the households' energy and transportation footprint. The EcoBlock's microgrid will be a new permanent installation that provides a unique, large deployment opportunity for a resilient microgrid that uses commercially available technologies. The Oakland EcoBlock includes five DERs applied in the California loading order: DER 1: energy efficiency retrofits and electrification of major home equipment; DER 2: controllable/deferrable loads for demand response; DER 3: electrification of transportation using EVs; DER 4: serving remaining load with a DC microgrid system powered by communal rooftop PV; and DER 5: a central energy storage system.

Besides facilitating DER deployment, the Oakland EcoBlock offers a suite of solutions that address SB 350 implementation head-on. The California Energy Commission recently adopted

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

targets to achieve the doubling of energy efficiency savings in electric and natural gas uses by 2030 as required by SB350. Much of the untapped energy efficiency potential to meet the targets can be achieved by improving the energy efficiency of existing buildings, as well as appliances and other devices used in those buildings, as laid out in the Energy Commission's Existing Building Energy Efficiency Action Plan. The Oakland EcoBlock will specifically address the untapped energy efficiency potential in homes by (1) driving energy efficiencies in the existing residential stock through deep energy efficiency retrofits implemented across entire blocks of homes, (2) substituting high-efficiency electric appliances (e.g., heat pump water heating and space heating) for gas-fired end-use appliances, and (3) replacing old, inefficient electrical appliances with high-efficiency units.

Agreement Objectives

The objectives of this Agreement are to:

- Design, install, and operate a solar-powered microgrid with energy storage, EV chargers, and other features, water systems, transportation systems, energy efficiency retrofits and installation of energy efficient appliances, with the removal of natural gas loads from all or a selection of units within designated houses, on a residential block in Oakland, California;
- Use the experience from this demonstration to develop a hardware design template for community microgrid systems to provide a cost-effective, modular, scalable solution;
- Develop advanced, integrated, open-source software modules to control residential, solar-powered microgrid systems;
- Update the EcoBlock business model for organizational structures, financing tools, and public policies necessary to accelerate the deployment of community scale microgrids;
- Verify the design and operation strategy for a commercially scalable microgrid system that can meet the following criteria:
- Meet the annual electrical energy needs of a group of retrofitted homes and associated EV chargers with zero carbon emissions,
- Use advanced automated demand response programs (advanced DR programs could be defined as dynamic time of use such as the Southern California Edison's Real Time Pricing);
- Provide energy storage round-trip efficiency of at least 85%;
- Deliver expected system lifetime of no less than 10 years.

Exhibit A

Scope of Work

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 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

- 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.

Exhibit A Scope of Work

- 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 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);
- Progress reports and invoices (subtask 1.5);

Exhibit A Scope of Work

- 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).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.

Exhibit A Scope of Work

- “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 quarterly *Progress Report* to the CAM. Each progress report must:
 - Summarize all Agreement activities conducted by the Recipient for the preceding months, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Summarize progress made on all Agreement activities as specified in the scope of work for the preceding months, 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.
 - Provide a synopsis of the project progress, including accomplishments, problems, milestones, products, schedule, fiscal status, and any evidence of progress such as photographs.
- Submit a quarterly *Invoice* that follows the instructions in the “Payment of Funds” section of the terms and conditions. In addition, each invoice must document and verify:
 - Energy Commission funds received by California-based entities;
 - Energy Commission funds spent in California (if applicable); and
 - Match fund expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end

Exhibit A Scope of Work

date. When creating the Final Report Outline and the Final Report, the Recipient must use a 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.
- Submit a draft of the outline to the CAM for review and comment.
- Once agreement has been reached on the draft, submit the final outline to the CAM. The CAM will provide written approval of the final outline within 10 days of receipt.

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.)
 - 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.

Exhibit A Scope of Work

- 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.
- 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.

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.
 - If different from the solicitation application, 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.

Exhibit A Scope of Work

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

Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

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

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

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

Products:

- Permit Status Letter
- Updated List of Permits
- Updated Schedule for Acquiring Permits
- Copy of each Approved Permit

Exhibit A Scope of Work

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, 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;

Exhibit A Scope of Work

- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

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

Products:

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

Subtask 1.11 TAC Meetings

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

The Recipient shall:

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

Products:

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

Exhibit A Scope of Work

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: Design, Development, and Permitting

The goals of this task are to: (1) engage the neighborhood, (2) finalize the microgrid electrical design, the home energy retrofit design, the water systems design, and the transportation system design, (3) develop schematic design and construction documents, and (4) obtain necessary construction and interconnection permits.

Subtask 2.1: Outreach and Engagement

The goals of this subtask are to: (1) engage the EcoBlock neighborhood in the decision-making processes, (2) establish a communication strategy for residents to provide feedback and create a shared working process, (3) confirm the availability of the project demonstration site; and (4) execute any agreements necessary to secure the demonstration site.

The Recipient shall:

- Identify all stakeholders in the Oakland EcoBlock utilizing a range of avenues and mechanisms to facilitate the widest possible participation.
- Design, create, and implement an *Outreach Strategy Plan* which is sensitive to the needs of the residents and overall neighborhood and to engage in a cumulative process to enable relationships and trust to build and strengthen over time.
- The Outreach Strategy Plan should detail the project team’s strategy for engaging residents and stakeholders throughout the project including any social media strategy and surveys. The questions asked during surveys and how many people were surveyed shall also be included in the Outreach Strategy Plan.
- Recruit households from the Oakland EcoBlock site to participate in the project.
- Secure agreements with the residents and owners of the selected households regarding their participation in the project and factors such as project timeline, space reserved for the project, equipment installation, permit and insurance requirements, indemnity, and the Recipient’s use of any construction or support staff.
- Secure similar agreements with any commercial properties involved in the project.
- Prepare and provide a *Site Readiness Verification Document* which will include Contracts or Memorandums of Understanding signed by the residents and owners of the selected households and commercial properties regarding all aspects of the project they and/or their properties will be involved in.
- Provide assistance and feedback regarding contents of any survey and audit questions to be administered to the Oakland EcoBlock residents.
- Facilitate survey and audit interactions with owners and residents.
- Facilitate outreach & education about project goals and project details to EcoBlock residents.

Products:

- Outreach Strategy Plan
- Site Readiness Verification Document

Exhibit A Scope of Work

Subtask 2.2. Pre-Design Planning and Engineering

The goals of this subtask are to collect and prepare all design, engineering, and planning background information necessary to finalize the schematic design for the EcoBlock including the microgrid, residential energy efficiency retrofits, and water and transportation systems. This task will also involve engaging the community as the Recipient finalizes design and prepares for construction. All design activities will start from the existing EcoBlock Phase I design.

The Recipient shall:

- Conduct appropriate existing conditions assessment to collect data needed for the design process, including site surveys, home energy and water audits, hazardous material assessments, visual conditions assessment of participating buildings, permitting history, and baseline transportation and parking conditions. Document findings in an *Existing Conditions Report*.
- Install any required baseline data collection equipment & software.
- Update existing EcoBlock Phase I design to address existing conditions documented during the site surveys and audits.
- Identify utility and other incentives that can be used to defray cost of the microgrid, energy efficiency and water retrofit package, and transportation measures.
- Develop *Construction Coordination Plan* that addresses coordination with utilities, permitting agencies, contractors, residents, and the EcoBlock Trust formed under Subtask 2.8 below.
- Prepare *EcoBlock Permits Assessment Document* describing the scope of the EcoBlock project and outlining the required permits, and non-conforming, non-compliant conditions cases.
- Conduct relevant and necessary review of options for needed changes to regulatory and permitting structure to accommodate block-scale retrofits in Oakland.
- Develop City of Oakland Entitlements Strategy necessary to efficiently review and process block-scale retrofit permit applications from private parties. Strategy will address needed alterations to City General Plan, Zoning Ordinance, permitting and approval processes, and other regulatory considerations, including electric vehicle infrastructure permit standard development.
- City of Oakland Entitlements Strategy shall be incorporation into the EcoBlock Guidebook developed under Subtask 6.3 below.
- Develop an *EcoBlock Program Narrative* documenting work scope to be performed for each participating Oakland EcoBlock building and the shared energy, water, and transportation systems, as well as addressing the other findings developed under Subtask 2.2.

Products:

- Existing Conditions Report
- Construction Coordination Plan
- EcoBlock Permits Assessment Document
- EcoBlock Program Narrative

Exhibit A

Scope of Work

Subtask 2.3: Schematic Design

The goals of this subtask are to finalize the EcoBlock microgrid system schematic design, residential energy efficiency retrofit schematic design, water systems schematic design, and shared transportation systems design. All design activities will build on the EcoBlock pre-design planning from Subtask 2.2.

The Recipient shall:

- Develop schematic design that addresses the sizing, siting, and interconnection of the microgrid system, including PV arrays, energy storage, power conversion equipment, EV chargers, and utility grid inter-tie.
- Develop schematic design that identifies EV and shared transit parking locations.
- Document the microgrid engineering plans, specifications, and cost estimates.
- Develop schematic design for residential energy and water retrofits, identifying the proposed energy and water retrofit upgrades and performance specifications criteria.
- Prepare *EcoBlock 50% Design Memo*, describing the schematic designs, engineering plans, specifications and cost estimates for the microgrid, residential energy and water, and transportation upgrades, including as described above.
- Prepare *CPR Report #1* and participate in a CPR meeting in accordance with subtask 1.3.

Products:

- EcoBlock 50% Design Memo
- CPR Report #1

Subtask 2.4: Design Development (80% drawings)

The goals of this subtask are to develop 80% drawings for the EcoBlock microgrid system, residential energy efficiency retrofit, water systems, shared transportation systems, and to engage the community as the project team prepares for construction. All design activities will build on the EcoBlock schematic design from Subtask 2.3.

The Recipient shall:

- Develop use cases and operational scenarios for the EcoBlock microgrid, based on input from block residents, microgrid engineers and vendors, and other stakeholders. Document in an *EcoBlock Microgrid Functional Specification*.
- Integrate the existing DER-CAM Supervisory Controller Software with the low-level microgrid controller. Adapt existing control algorithms as needed for residential microgrid control, with reuse of existing algorithms for economic optimization and forecasting, including load forecasting, solar generation forecasting, and EV charging load forecasting. Integrate commercially available home automation products for control of the flexible residential loads.
- Confirm requirements and architecture for microgrid control system, and document in *Microgrid Control System Design Report*. This document will cover the microgrid supervisory and low-level controller, residential load control, and EV charge control.
- Design and engineer the microgrid system to 80% construction documents, including PV arrays, energy storage, power conversion equipment, EV chargers, and utility grid inter-tie. Engineering plan set (80% Design) includes specifications and cost estimates.
- Create draft construction documents for residential energy and water retrofits. Develop 80% permit-submission information packet.

Exhibit A Scope of Work

- Prepare *EcoBlock 80% Design and Engineering Memo*, describing engineering plans, specifications and cost estimates for the microgrid, residential energy and water, and transportation upgrades including information as described above.

Products:

- EcoBlock Microgrid Functional Specification
- Microgrid Control System Design Report
- EcoBlock 80% Design and Engineering Memo

Subtask 2.5: Construction Drawings

The goals of this subtask are to prepare final construction documents for the EcoBlock microgrid system, residential energy efficiency retrofits, and water and transportation systems. All design activities will build on the EcoBlock design development from Subtask 2.4.

The Recipient shall:

- Integrate engineering designs into a *Microgrid Engineering Plan Set* (100% Design) for the full EcoBlock, including all microgrid, energy efficiency, water, and transportation components exterior to the residential buildings.
- Develop final *Residential Energy and Water Retrofit Construction Documents*, including specifications for each home retrofit adequate for permit submission for home retrofits.
- Prepare *EcoBlock 100% Design and Engineering Memo*, describing finalized engineering plans, specifications and cost estimates for the EcoBlock, including the microgrid, residential energy and water, and transportation upgrades.
- Prepare *CPR Report #2* and participate in a CPR meeting in accordance with subtask 1.3.

Products:

- Microgrid Engineering Plan Set
- Residential Energy and Water Retrofit Construction Documents
- EcoBlock 100% Design and Engineering Memo
- CPR Report #2

Subtask 2.6: Permitting and Interconnection Agreement

The goal of this subtask is to secure required permits, execute an interconnection agreement with Pacific Gas and Electric (PG&E) for the distributed energy system and establish the proper electricity tariff with the electricity provider.

The Recipient shall:

- Obtain required electrical and building permits from the City of Oakland, for both the microgrid and the residential energy and water retrofits.
- Work with PG&E to facilitate system interconnection.
- Execute an interconnection agreement with PG&E.
- Schedule and execute PG&E inspections and testing as necessary.
- Document results of permit and interconnection process in *System Permitting and Interconnection Memo*

Products:

- System Permitting and Interconnection Memo

Exhibit A Scope of Work

Subtask 2.7: Form EcoBlock Cooperative

The goal of this subtask is to prepare the documentation and form the EcoBlock Cooperative legal entity and document the steps necessary to create a Community Facilities District (CFD).

The Recipient shall:

- Engage EcoBlock owners and residents for them to establish a legal team to represent them.
- Develop governance documents such as bylaws.
- Execute legal process to form the EcoBlock Cooperative and document in *EcoBlock Trust Formation Memo*.
- Create the legal framework for the EcoBlock Community Facilities District (CFD) with the community, and in the event that it is decided to actually create a CFD for the EcoBlock, engage legal consultants and implement all other necessary measures to conduct a vote among block residents to establish the CFD. If this is brought about, document the CFD in an *EcoBlock Community Facilities District Memo*.

Products:

- EcoBlock Trust Formation Memo
- EcoBlock Community Facilities District Memo

Task 3: Construction and Commissioning

The goal of this task is to procure the required equipment and materials, and complete installation and commissioning of the Oakland EcoBlock including the advanced microgrid system, the home energy retrofits, the water systems, and transportation systems.

Subtask 3.1: Microgrid Construction

The goal of this subtask is to procure equipment and materials, and complete construction of the microgrid components needed to generate, store, and distribute power. In addition, this will include the shared transportation components of the EcoBlock.

The Recipient shall:

- Construct and install microgrid components according to the designs from task 2 including, but not limited to the following:
 - Rooftop solar arrays,
 - Energy storage system,
 - Power distribution system (including power converters, protection equipment, distribution wiring, power meters, home DC distribution panels, and communication infrastructure),
 - EV charging stations and any other shared transportation systems such as shared EVs,
 - Grid interconnection (bi-directional converter, medium voltage transformer),
 - Microgrid controller,
 - Any additional instrumentation identified in the measurement and verification (M&V) plan from Task 4; and
- Prepare a *Microgrid Construction Memo* to document the completion of the microgrid and transportation construction phase.

Products:

- Microgrid Construction Memo

Subtask 3.2: Residential Building Retrofit Construction

Exhibit A

Scope of Work

The goal of this subtask is to procure equipment and materials, and complete the energy and water retrofits in the selected homes in the Oakland EcoBlock.

Energy Commission funds shall not be used to cover any energy efficiency measures or appliances that are not designed or intended to provide electricity savings; energy generation or storage systems that directly utilize non-renewable fuels or are installed outside of Oakland EcoBlock; transportation vehicles; or distribution or transmission system upgrades on the utility side of the meter

The Recipient shall:

- Remove natural gas loads from all or selected building units
- Retrofit and install according to the designs from task 2, including, but not limited to:
 - Electric space conditioning and water heating upgrades,
 - Ceiling and floor insulation and air sealing,
 - Duct sealing,
 - Efficient ventilation fans,
 - Energy and water efficient appliances (where selected),
 - High efficacy LED lighting,
 - Water efficient plumbing fixtures and fittings,
 - Laundry-to-landscape grey water system or raingarden (where selected),
 - Home gateway for communication with the microgrid,
 - Any home energy management systems for occupants (if available), and
 - Any additional instrumentation identified in the M&V plan from task 4.
- Complete third-party inspections on building retrofits for quality assurance and quality control.
- Prepare a *Residential Building Retrofit Construction Memo* to document the completion of the home retrofit construction.

Products:

- Residential Building Retrofit Construction Memo

Subtask 3.3: System Commissioning and Interconnection

The goal of this subtask is to verify the proper operation of the newly installed microgrid, shared transportation and water systems, and home retrofit systems, and put the systems into operation.

The Recipient shall:

- Develop an *EcoBlock System Commissioning Plan* which will describe, at a minimum, the steps needed to begin operation of the microgrid, shared water and transportation and home retrofit systems. This may include requirements for interconnection, and validation of the proper operation of system components and the system as a whole.
- Implement the plan to verify the proper operation of the system components and the overall systems.
- Complete the interconnection of the microgrid with the utility distribution grid.
- Connect the homes to the microgrid distribution system.
- Prepare an *EcoBlock System Commissioning Report*, which will, at a minimum, describe the results of the interconnection and system commissioning process and highlight any unique challenges or lessons faced with bringing the EcoBlock system online.
- Prepare *CPR Report #3* and participate in a CPR meeting in accordance with subtask 1.3.

Exhibit A Scope of Work

Products:

- EcoBlock System Commissioning Plan
- EcoBlock System Commissioning Report
- CPR Report #3

Task 4: Measurement and Verification

The goal of this task is to conduct independent measurement and verification for a 12-month post installation period for the Oakland EcoBlock, to verify that it is meeting the performance targets and delivering the expected benefits. The Recipient will operate the microgrid, building energy, water, and transportation systems for a full year under varying conditions, measure and document their performance, and use the lessons learned from constructing and operating the microgrid to refine the business case for future scale-up of EcoBlocks. This task includes a simplified plan for on-going, post-EPIC grant monitoring and verification to evaluate persistence and sustainability of savings, as well as a strategy to report results back to building owners and operators.

Subtask 4.1: Measurement and Verification Plan

The goal of this subtask is to develop a measurement and verification plan for all aspects of the EcoBlock: the microgrid, the energy in buildings (appliances and building level HVAC/water heating), the water systems, transportation systems, and overall evaluation of the residential experience.

The Recipient shall:

- Develop an *EcoBlock Measurement and Verification Plan* that identifies and describes:
 - Key performance criteria for the EcoBlock, and the input parameters and output metrics that will be measured to verify performance including, but not limited to, energy use (kilowatt hours, therms), renewable energy generation (kilowatt hours), water use (gallons), and cost savings for energy, water, and other benefits as applicable;
 - Monitoring equipment and instrumentation required to collect verification data;
 - Data acquisition criteria, such as sampling frequency for various parameters;
 - Analysis methods needed to generate all performance metrics listed in the Agreement Objectives section of this Scope of Work;
 - EcoBlock operating scenarios that will be implemented during the one-year operation verification phase, such as islanded mode for the microgrid.
 - Additional information that will be necessary to complete the measurement and verification task (e.g., self-reported data on EcoBlock resident experience).

Products:

- EcoBlock Measurement and Verification Plan

Subtask 4.2: Operate and Evaluate the EcoBlock Systems

The goal of this subtask is to operate the Oakland EcoBlock (including microgrid, building energy and water, and shared transportation systems) and execute the measurement and verification plan from subtask 4.1, including establishing the appropriate baseline and utilizing the appropriate monitoring tools (e.g., surveys, sub-meters). This subtask will also evaluate the residential experience in order to assess performance, determine long-term effectiveness, and identify operational issues that may affect future EcoBlock installations.

The Recipient shall:

- Operate and maintain the Oakland EcoBlock, including the microgrid, building energy systems, water systems and transportation systems for one year after commissioning;

Exhibit A Scope of Work

- Collect data specified in the EcoBlock Measurement and Verification Plan;
- Implement the operational scenarios described in the EcoBlock Measurement and Verification Plan, such as microgrid islanding tests and demand-response program participation;
- Assess performance and customer value of the EcoBlock microgrid, building energy, water, and transportation systems. The findings will inform the EcoBlock Case Study described in Task 6 below.
- Assess the resident experience with the formation of the Oakland EcoBlock (Trust and CFD), design, construction, and operation of the EcoBlock systems. Document findings in a *Residential Experience Assessment Report*.
- Prepare an *EcoBlock System Performance Report* to document assessment results, including information gathered from implementation of the EcoBlock Measurement and Verification Plan.
- Develop an *EcoBlock Operational Plan* to guide operation of the EcoBlock systems after the end of the EPIC project.

Products:

- Residential Experience Assessment Report
- EcoBlock System Performance Report
- EcoBlock Operational Plan

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.

Exhibit A Scope of Work

- 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.
- 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 make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

Exhibit A Scope of Work

Subtask 6.1: Technology/Knowledge Transfer Planning and Reporting Activities

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.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop on the results of the project.
- 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.
- Prepare a Technology/Knowledge Transfer Report on technology transfer activities conducted during the project.
- 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:

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

Subtask 6.2: EcoBlock Case Study

This subtask will develop a case study documenting the actions taken in the development of the Oakland EcoBlock.

The Recipient shall:

Document the following in an *EcoBlock Case Study*:

- Specific challenges encountered and the specific actions taken to overcome them.
- Soft innovations and process efficiencies learned, and the expected time and cost savings from these efficiencies for future buildouts.

Exhibit A Scope of Work

- Specific components (e.g., technological, financial) of the demonstrated project that need improvement/advancement to increase future deployment of AECs.
- Feedback from EcoBlock participants and utility customers (e.g., what features customers value most/least, customer pain points).
- How the technical and financial performance of the EcoBlock demonstrated in Phase II compares to expectations during the Phase I planning phase, and how the knowledge gained and lessons learned from the project could inform your Phase I recommendations/findings.

Products:

- EcoBlock Case Study

Subtask 6.3: EcoBlock Guidebook

The goal of this subtask is to evaluate and refine the EcoBlock business model developed in Phase I, using the experience and data collected during the design, construction, and operation of the Oakland EcoBlock, for the purpose of assessing the replicability and scalability of the EcoBlock technical design and business model.

The Recipient shall:

- Compile lessons learned from throughout the Oakland EcoBlock demonstration project phases.
- Refine the suite of financing, governance and ownership structures developed in EcoBlock Phase I to facilitate and manage the EcoBlock investments.
- Conduct scalability analysis (verify Phase I scalability analysis with empirical data).
- Develop an *EcoBlock Guidebook* that can be used as a model for future EcoBlock implementation throughout California.

Products:

- EcoBlock Guidebook

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

**STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION**

RESOLUTION - RE: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, ON BEHALF OF THE BERKELEY CAMPUS

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-18-013 with The Regents of the University of California, on behalf of the Berkeley campus, for a \$5,000,000 grant to deploy a block-scale retrofit development combining deep energy efficiency retrofit strategies, integrated distributed energy generation systems, and water conservation and capture systems in a low-to-middle income neighborhood in the City of Oakland, and adopting staff's determination that this action is exempt from CEQA; 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 June 12, 2019.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat

