



**CALIFORNIA  
ENERGY COMMISSION**



**California Energy Commission  
March 13, 2024 Business Meeting  
Backup Materials for Electric Power Research Institute, Inc.**

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

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

**[PROPOSED]**

**RESOLUTION NO: 24-0313-14b**

**STATE OF CALIFORNIA**

**STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION**

**RESOLUTION: Electric Power Research Institute, Inc.**

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

**RESOLVED**, that the CEC approves agreement EPC-23-026 with Electric Power Research Institute, Inc. for a \$8,000,000 grant to build an all-electric, transit integrated affordable multifamily community. The community intends to have up to 131 affordable housing units alongside mixed use commercial usage and is designed to address the current challenges of lengthy interconnection timelines by not exporting power back to the grid, but also leveraging the grid at times where distributed generation cannot support the community's energy needs; and

**FURTHER BE IT RESOLVED**, that the Executive Director or their designee shall execute the same on behalf of the CEC.

**CERTIFICATION**

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the CEC held on March 13, 2024.

AYE:

NAY:

ABSENT:

ABSTAIN:

Dated:

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Kristine Banaag  
Secretariat



## GRANT REQUEST FORM (GRF)

### A. New Agreement Number

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

**New Agreement Number:** EPC-23-026

### B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Michael Ferreira
3. MS-:51
4. Phone Number: 510-364-8808

### C. Recipient's Information

1. Recipient's Legal Name: Electric Power Research Institute, Inc.
2. Federal ID Number: 23-7175375

### D. Title of Project

Title of project: Minimal Unidirectional Zero-Net Energy Community through a Stand-by Grid Connection

### E. Term and Amount

1. Start Date: 4/1/2024
2. End Date: 5/31/2028
3. Amount: \$8,000,000

### F. Business Meeting Information

1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 03/13/2024
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Jemar Roble Tan
5. Time Needed for Business Meeting: 10 minutes.
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

#### **Agenda Item Subject and Description:**

Electric Power Research Institute, Inc.

ELECTRIC POWER RESEARCH INSTITUTE, INC. Proposed resolution approving agreement EPC-23-026 with Electric Power Research Institute, Inc. for a \$8,000,000 grant to build an all-electric, transit integrated affordable multifamily community, and adopting staff's determination that this project is exempt from CEQA. The community intends to have up to 131 affordable housing units alongside mixed use commercial usage and is designed to address the current challenges of lengthy interconnection timelines by not exporting power back to the grid, but also leveraging the grid at times where distributed generation cannot support the community's energy needs. (EPIC funding) Contact: Michael Ferreira (Staff Presentation: 10 minutes)



## G. California Environmental Quality Act (CEQA) Compliance

### 1. Is Agreement considered a “Project” under CEQA?

Yes

If yes, skip to question 2.

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

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

### 2. If Agreement is considered a “Project” under CEQA answer the following questions.

#### a) Agreement **IS** exempt?

Yes

Statutory Exemption?

Yes or No

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

PRC section number:

CCR section number: CCR section number 1, CCR section number 2. Or, None

Categorical Exemption?

Yes or No

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

CCR section number:

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

No

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

The project, Meridian at Petaluma North Station Project (previously Corona Station), includes mixed use affordable housing, on-site supporting housing services, a 1.38 acre parcel dedicated to Sonoma Marin Area Rail Transit (SMART) for the future Corona Station and a 0.5 acre parcel for future commercial development. The City of Petaluma processed this project as a streamlined ministerial project under AB 2162 (2018), and it was approved by the City's Council on September 15, 2021. According to the City, since the project is consistent with the objective General Plan and zoning standards, the project does not require a Conditional Use Permit for multi-family residential use in the Mixed Use 1B (MU1B) zoning district.

As a project eligible for streamlined ministerial review under AB 2162, this Project is exempt from the provisions of the CEQA. Danco has voluntarily agreed to incorporate best practices mitigation measures to minimize and avoid environmental impacts.



The project will not impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2 apply to this project, and this project will not have a significant effect on the environment.

b) Agreement **IS NOT** exempt.

**IMPORTANT:** consult with the legal office to determine next steps.

No

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

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

## H. Subcontractors

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

**Delete** any unused rows from the table.

Subcontractor Legal Company Name	CEC Funds	Match Funds
Mithun, Inc.	\$ 75,060	\$0
PAE Consulting Engineers, Inc	\$ 87,998	\$0
Redwood Energy, LLC	\$ 250,000	\$0
Larsen & Toubro Limited	\$ 160,018	\$0
The Rahun Institute	\$ 50,000	\$0
Danco Communities	\$ 5,500,000	\$0
Russell S Griffith Consulting LLC	\$ 65,000	\$0

## I. Vendors and Sellers for Equipment and Materials/Miscellaneous



STATE OF CALIFORNIA  
CALIFORNIA ENERGY COMMISSION

Grant Request Form  
CEC-270 (Revised 9/2022)

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

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

**J. Key Partners**

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

Key Partner Legal Company Name
No key partners to report

**K. Budget Information**

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

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	22-23	301.001J	\$ 8,000,000

**TOTAL Amount:** \$ 8,000,000

R&D Program Area: Admin: General

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: Not applicable

**L. Recipient's Contact Information**

**1. Recipient's Administrator/Officer**

Name: Nancy Martin

Address: 942 Corridor Park Blvd

City, State, Zip: Knoxville, TN 37932-3723

Phone: 865-218-5937

E-Mail: nmartin@epri.com

**3. Recipient's Project Manager**

Name: Herb Yaptinchay

Address: 3420 Hillview Ave

City, State, Zip: Palo Alto, CA 94304-1355

Phone: 650-855-2499



E-Mail: HYaptinc@epri.com

### M. Selection Process Used

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

Selection Process	Additional Information
Competitive Solicitation #	GFO-20-305p3
First Come First Served Solicitation #	Not applicable
Other	Not applicable

### N. Attached Items

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

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

### Approved By

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

**Agreement Manager:** Michael Ferreira

**Approval Date:** 1/25/2024

**Branch Manager:** Anthony Ng

**Approval Date:** 1/25/2024

**Director:** Anthony Ng for Jonah Steinbuck

**Approval Date:** 1/25/2024

**EXHIBIT A**  
**Scope of Work**  
**Electric Power Research Institute, Inc.**

**TASK ACRONYM/TERM LISTS**

**A. Task List**

Task #	CPR	Task Name
1		General Project Tasks
2	X	System Design & Integration
3		Finance
4	X	Technology Procurement, Installation and Commissioning
5	X	Measurement and Verification
6		Community Engagement
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

**B. Acronym/Term List**

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
BESS	Battery Energy Storage System
BTM	Behind the Meter
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CBO	Community Based Organization
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CLT	Cross-Laminated Timber
CPR	Critical Project Review
DR	Demand Response
DER	Demand Energy Resources
DSRIP	Demand Side Resource Integration Platform
EDR	Energy Design Rating
ERV	Energy Recovery Ventilation
EUI	Energy Use Intensity
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
GHG	Greenhouse Gas
GWP	Global Warming Potential
HP	Heat Pump
HVAC	Heating, Ventilation, & Air Conditioning
IAQ	Indoor Air Quality
LEED	Leadership in Energy and Environmental Design
LCA	Life-Cycle Analysis
MW	Megawatts
PV	Photovoltaic
TAC	Technical Advisory Committee
VRF	Variable Refrigerant Flow



**EXHIBIT A**  
**Scope of Work**  
**Electric Power Research Institute, Inc.**

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
V2M	Vehicle to Microgrid

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

**A. Purpose of Agreement**

The purpose of this Agreement is to support the building of an all-electric, transit integrated affordable multifamily community. The community intends to have approximately 131 affordable housing units alongside mixed use commercial usage. The community is designed to address the current challenges of lengthy interconnection timelines that can delay construction and renewable energy and distributed generation to the grid by: developing a community that does not export power back to the grid, but also leverages the grid at times where the community's distributed generation (solar, storage, and electric vehicles) cannot support the necessary energy needed for the community. This community is designed as a limited-carbon and climate resilient community focused on positive, equitable outcomes for low-income residents. This project will be an exemplary demonstration of an alternative flexible interconnected community and how to integrate leading energy-efficiency technologies, ecologically friendly elements, tools, and construction practices affordably and innovatively into the design and construction of mixed-use mid-rise developments that are equitable, climate-resilient, and cost-competitive. The community intends to be a proof of concept how emerging technology capabilities for integrated, all-electric community designs with distributed energy resources (DER)s that can potentially minimize the need for considerable grid upgrades for the electrification of not only buildings but the transportation sector to meet California climate goals.

**B. Problem/ Solution Statement**

**Problem**

The challenge of affordable housing availability is considerable in the state of California and the country as a whole. However, much of the affordable housing stock is inefficient, leaky, and uncomfortable. Achieving the state goals for a net zero carbon economy by 2045 will require new buildings constructed from now on to get as close to carbon neutrality as possible. What is needed are showcase projects that illustrate to developers around the state on how to design energy efficient communities that are still cost effective, improve health outcomes, and reduce the energy burden for the disadvantaged populations in the state. In addition, proof of concepts must be developed and highlighted to show how a combination of advanced, efficient-electrified technologies along distributed energy resources can not only enable low-carbon communities but do so in a way that minimizes expansive grid upgrades and convoluted interconnection processes associated with building and transportation electrification. At the same time, climate resilience and adaptation are becoming imperatives in our state, and we need to demonstrate how these low carbon buildings can enhance resilience and adaption.

**Solution**

## EXHIBIT A

### Scope of Work

#### Electric Power Research Institute, Inc.

The electrical design of the project is designed to accommodate the challenges of California's power grid as the economy becomes more electrified. In order to prevent interconnection delays, the proposed electrical system for the project is designed not to export power back to the grid, but also leverages the grid at times where the community's distributed generation (solar, storage, and electric vehicles) cannot support the necessary energy needed for the community. This is enabled through a selective interconnection service agreement as a customized local controller will control end-use loads and distributed energy resources so the community will export zero electricity to the grid and selectively imports electricity from the grid (e.g. during off-peak or limited days between the hours of 4 and 9 PM). The proposed selective interconnection approach and the Behind the Meter (BTM) DERs utilization could prove a design that would allow other property developers to accelerate their interconnection applications. For all but about 350 to 400 hours, during two to three weeks of the year the solar panels will always deliver enough power to the battery to maintain the site's daytime energy use, fill the battery for use overnight, and have excess power during the day to provide free EV charging to residents. In addition, winter storms from mid-December to January, if the sun does not come out at all for a few days, the solar panels will occasionally not be completely sufficient alone, and the development may need to tap into the grid as a standby power source for a portion of the energy load. The tenants are at the heart of the development's community. This project intends to work with local Community Based Organizations (CBO) to provide community education and on-site, in-person forums which the public can attend that will educate and inform tenants and the local community on the uniqueness of the development, personal energy use, and their total energy burden. The project intends to conduct tenant surveys on their energy use and their community experience which is intended to help inform property management on potential action items that can improve the community experience.

To maximize success and minimize risks, several existing and emerging technologies will be leveraged in a novel and highly resilient way. The proposed technologies include:

- **Stationary Batteries:** Modular, outdoor rated, nickel-hydrogen energy storage systems that prevent existence of a single point of failure that can cause a service interruption to the facility.
- **A unidirectional DC power supply,** with an active front end for power quality control will be utilized for this design. This power supply will be similar to or derived from supplies used to power DC EV fast chargers but will be used to charge the energy storage from grid during the rare times when local renewables are forecasted to be inadequate to supply the needs of the facility, which would be less than 6% of the time.
- **Solar:** Solar panels will cover the roofs at approximately 15 degrees to the maximum extent allowable for fire safety rules, and carport solar arrays have been extended to cover almost the entire parking lot, also leaving the required room to drive between the parking spaces. PV at diverse elevations and azimuths provides a less peaky generation profile that better fits the daily energy use of residents. Again, the PV system will be modular to prevent single points of failure and feed directly into a renewables bus to which the battery energy storage systems will also be connected. A PV forecasting application service will be secured to allow the site controller to predict the future PV resource available to the site a day or more ahead in order to allow the site controller to prepare for times of higher or lower irradiance by driving the state of charge up or down in advance of events as needed by load curtailment or by pre heating water heaters or pre-heating or pre-cooling units with heat pump systems.

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**Scope of Work**  
**Electric Power Research Institute, Inc.**

- **V2M** (vehicle to microgrid) capable EV chargers will be used to allow vehicles to serve the building load in the microgrid. A portion of the V2M chargers will be isolated from the grid and the completeness of the grid codes and interconnection processes for V2M chargers has no bearing on the ability of the development to leverage these technologies to benefit the tenants. These chargers will provide charging for free to residents to facilitate cost-effective EV adoption by residents which would directly benefit California's clean energy goals of reaching Zero Carbon by 2045. Additionally, some chargers may also provide charging for non-residents at a nominal cost to offset the cost of providing this service to the residents as well as drive commercial traffic.
- **No natural gas** service is incorporated into this facility, so all loads and services will be completely all-electric. By itself this is a well-worn strategy for this project developer, but taking an apartment complex off-grid with no gas service is a highly emergent strategy.
- **Critical Loads:** This facility will be arranged with a unique electrical system that facilitates economically effective and equitable load shedding in the event of a renewables shortfall or price-driven requirement. The final design decision is to utilize a "split phase" wiring strategy, which enables a cost-neutral pathway to load control in each unit. The circuits feeding each dwelling unit will be of the split-phase type, and when load shedding becomes necessary, the site controller will open one leg of the split phase feed to each dwelling unit).
- **Single 408V bus:** All renewables, including numerous PV arrays and modular energy storage will be on a single 480V bus, using a separate transformer from the dwelling units in order to provide higher efficiency for the renewables as well as permit the renewables to be isolated from the grid in emergency conditions by a transfer switch. The transfer switch will be connected to a PG&E standby service in order that the community may be grid connected in the event of an emergency condition. The system is never intended to connect to the grid; however it is a useful feature for resilience in the event that the renewables system requires an outage for maintenance or other emergency conditions.
- **Unidirectional charger:** Additionally, the grid will be permanently connected to a low-power unidirectional charger that can optionally provide supplemental charging energy to the energy storage in periods of low irradiance. The site controller will ensure this charger is not active during peak periods, such as 4-9 pm. Additionally, this permanently connected bus can serve several EV chargers in the parking lot that may be publicly accessible to facilitate additional EV adoption and provide additional commercial opportunity for the property.

**C. Goals and Objectives of the Agreement**

**Agreement Goals**

The goals of this Agreement are to:

- Demonstrate an all-electric, net zero affordable multifamily community with a site density of 139 dwellings per acre, with an approximate 50% reduction in tenant energy burden, a 40% reduction in embodied carbon, and a 90% reduction in operational carbon compared to Title 24, using a selective interconnection approach.

**EXHIBIT A**  
**Scope of Work**  
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- Minimize net energy use from the community between the hours of 4 and 9 PM while ensuring uninterrupted, renewable based power for Tier 1 loads, which will comprise approximately 10% of total energy use of the community.

**Ratepayer Benefits:**<sup>1</sup> This Agreement will result in the following ratepayer benefits:

- **Enabling State Policy Goals:** By demonstrating how to achieve all-electric, zero operational carbon communities with substantially reduced embodied carbon, at zero to low incremental cost, this project will provide a template to demonstrate that can be adopted by new developments around the state in a race to achieve the goals of SB 100.
- **Greater Electricity Reliability.** This project will provide new data, analysis, and design for an alternative flexible interconnected, energy efficient community using a selective interconnection approach, which will improve reliability with the integration of energy efficiency, demand control, and renewable power with buildings.
- **Climate Adaptation Benefits for affordable housing customers:** This project will demonstrate a much higher level of resilience for affordable housing occupants by:
  - An innovative selective interconnection electrical architecture that will be immune to PSPS and other grid disruptions.
  - A better envelope that reduces the impacts of climate change driven heat waves
  - A better HVAC system that can reduce their energy burden while still being able to provide protection against smoke related IAQ issues.
  - Creating an emergency shelter concept that could be utilized the larger neighborhood that enables provision of basic services during times of disruption.
  - An ecologically friendly outdoor common-area design that includes water re-use, thoughtful landscape design, and storm control techniques and materials.
- **Potential Lower Costs.** Significant savings in money in reduced interconnection delays, resources, operation and maintenance, energy, and greenhouse gases are available. Both ratepayers and customers could benefit from the implementation of this selective interconnection approach.

**Technological Advancement and Breakthroughs:** 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

1. Eliminating operational carbon emissions through full electrification and offsetting with site based solar.
2. Developing a proof of concept and a framework on how flexible, electrified technologies alongside solar, storage, and V2B-enabled electric vehicle charging infrastructure can be locally managed to meet emerging flexible interconnection practices – minimizing the cost of electrical grid upgrades associated with building and transportation electrification.

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<sup>1</sup> 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](http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF)).

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3. Reduce fossil fuel usage in transportation by co-locating with the transit center (reducing car usage) as well as the availability of EV Chargers for tenant and public use.
4. Evaluate a whole series of emerging technologies for implementation within this community and spending in depth time on understanding the readiness and applicability of these technologies. Innovative emerging technologies that will be installed include, but are not limited to:
  - Passive House envelope with cork siding,
  - 120V grid-responsive Heat Pump HVAC and Water Heaters,
  - 2 MW Battery Energy Storage System
  - 1.27 MW PV array
  - Bidirectional EV chargers
  - Low power community heat pump dryers
  - LED Lighting and lighting controls.
  - Grey-Water re-use system
  - Permaculture strategy for landscaping
  - Mass-Timber Carport Design to support the PV array.

**Agreement Objectives**

The objectives of this Agreement are to:

- Demonstrate an all-electric, net zero affordable multifamily community with an approximate 50% reduction in tenant energy burden, a 40% reduction in embodied carbon, and a 90% reduction in operational carbon using a selective interconnection approach.
- Install an estimated 2 MW Battery Energy Storage System (BESS) and 1.27MW solar PV system and develop and deploy a *site controller* that will:
  - Coordinate and control BTM DERs with buildings loads (end-use loads must be electric) and provide tenants year-round resiliency with an efficiency package, solar array and storage system that provides enough energy for both buildings and vehicles to use no energy from the grid for 95% of all hours in a year,
  - Support load and DER management algorithms to manage critical controllable loads, on-site solar power, energy storage, and other distributed generation assets,
  - Manage and coordinate the building's residential load during peak demand hours, 4-9pm, through a combination of onsite renewables, onsite storage, and load management and establish "zero export" at all times and allows for 100%, rather than 20% of the building's peak load to be available to be temporarily managed or curtailed to respond to grid conditions, with a 2 MWh central battery and controls,
  - Forecast hourly solar PV generation and demand from electric loads.
  - Perform Load Management/Shedding strategy for the community when called upon by PV and demand forecast,
  - Support only selective interconnection during off-peak period and ensure the import from the grid is not between the peak hours of 4 and 9 PM,
  - Support grid power charging of the BESS through selective grid interconnection during off-peak periods. In addition, several V2G capable bidirectional chargers would be installed onsite that would enable additional support to the building while functioning in the off-grid mode.

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- manage energy storage and managing EV chargers to eliminate net energy use from the building between 4 and 9 pm
- Evaluate a series of innovative emerging technologies and environmental strategies for incorporation within the community design.
- Work with the community educate them on energy use, indoor air quality and total energy burden.

## **II. TASK 1 GENERAL PROJECT TASKS**

### **PRODUCTS**

#### **Subtask 1.1 Products**

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

#### **The Recipient shall:**

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

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

##### For products that require a final version only

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

##### For all products

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

**EXHIBIT A**  
**Scope of Work**  
**Electric Power Research Institute, Inc.**  
Instructions for Submitting Electronic Files and Developing Software:

○ **Electronic File Format**

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

The following describes the accepted formats for electronic data and documents provided to the CEC as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

○ **Software Application Development**

Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open-source programs:

- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
- Visual Studio.NET (version 2008 and up). Recommend 2010.
- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

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

## **MEETINGS**

### **Subtask 1.2 Kick-off Meeting**

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

**The Recipient shall:**

**EXHIBIT A**  
**Scope of Work**  
**Electric Power Research Institute, Inc.**

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

The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Invoicing and auditing procedures;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.
- Provide *Kick-off Meeting Presentation* to include but not limited to:
    - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
    - Project schedule that identifies milestones
    - List of potential risk factors and hurdles, and mitigation strategy
  - Provide an *Updated Project Schedule*, *Match Funds Status Letter*, and *Permit Status Letter*, as needed to reflect any changes in the documents.

**The CAM shall:**

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

**Recipient Products:**

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

**CAM Product:**

- Kick-off Meeting Agenda



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**Subtask 1.3 Critical Project Review (CPR) Meetings**

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

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

**The Recipient shall:**

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

**The CAM shall:**

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

**Recipient Products:**

- CPR Report(s)

**CAM Products:**

- CPR Agenda
- Progress Determination

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**Subtask 1.4 Final Meeting**

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

**The Recipient shall:**

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

The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

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

**Products:**

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

**REPORTS AND INVOICES**

**Subtask 1.5 Progress Reports and Invoices**

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

**The Recipient shall:**

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
  - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.

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- Submit a monthly or quarterly *Invoice* that follows the instructions in the “Payment of Funds” section of the terms and conditions, including a financial report on Match Funds and in-state expenditures.

**Products:**

- Progress Reports
- Invoices

**Subtask 1.6 Final Report**

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

**Subtask 1.6.1 Final Report Outline**

**The Recipient shall:**

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

**Recipient Products:**

- Final Report Outline (draft and final)

**CAM Product:**

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

**Subtask 1.6.2 Final Report**

**The Recipient shall:**

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Energy Commission Style Manual, and Final Report Template provided by the CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (**required**)
    - Credits page on the reverse side of cover with legal disclaimer (**required**)
    - Acknowledgements page (optional)
    - Preface (**required**)
    - Abstract, keywords, and citation page (**required**)
    - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
    - Executive summary (**required**)
    - Body of the report (**required**)
    - References (if applicable)
    - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
    - Bibliography (if applicable)
    - Appendices (if applicable) (Create a separate volume if very large.)

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- Attachments (if applicable)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
  - Comments the recipient proposes to incorporate.
  - Comments the recipient does propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

**Products:**

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

**CAM Product:**

- Written Comments on the Draft Final Report

**MATCH FUNDS, PERMITS, AND SUBCONTRACTS**

**Subtask 1.7 Match Funds**

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

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

**The Recipient shall:**

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the CEC awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

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

- A list of the match funds that identifies:
  - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds

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will be applied.

- The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
- If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

**Products:**

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

**Subtask 1.8 Permits**

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

**The Recipient shall:**

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

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

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.

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- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

**Products:**

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

**Subtask 1.9 Subcontracts**

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

**The Recipient shall:**

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

**Products:**

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

**TECHNICAL ADVISORY COMMITTEE**

**Subtask 1.10 Technical Advisory Committee (TAC)**

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

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.

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- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

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

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

**The Recipient shall:**

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

**Products:**

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

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##### **Subtask 1.11 TAC Meetings**

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

##### **The Recipient shall:**

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

##### **The TAC shall:**

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

##### **Products:**

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

##### **Subtask 1.12 Project Performance Metrics**

The goal of this subtask is to finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

##### **The Recipient shall:**

- Complete and submit the project performance metrics from the Initial Project Benefits Questionnaire, developed in the Evaluation of Project Benefits task, to the CAM.



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- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a TAC Performance Metrics Summary that summarizes comments received from the TAC members on the proposed project performance metrics. The TAC Performance Metrics Summary will identify:
  - TAC comments the Recipient proposes to incorporate into the Initial Project Benefits Questionnaire, developed in the Evaluation of Project Benefits task.
  - TAC comments the Recipient does not propose to incorporate with and explanation why.
- Develop and submit a Project Performance Metrics Results document describing the extent to which the Recipient met each of the performance metrics in the Final Project Benefits Questionnaire, developed in the Evaluation of Project Benefits task.
- Discuss the Project Performance Metrics Results at the Final Meeting.

**Products:**

- TAC Performance Metrics Summary
- Project Performance Metrics Results

### **III. TECHNICAL TASKS**

#### **TASK 2: SYSTEMS DESIGN & INTEGRATION**

The goals of this task are to: (1) validate and refine the Selective Interconnection Service System electrical design and work through the request and approval of the PG&E Selective Standby Service Interconnection Arrangement and (2) finalize the EPIC design plans as needed and develop construction documents

**The Recipient shall:**

- Prepare and submit a set of *Final Design Plans* including but not limited to:
  - Architectural design development.
  - Mechanical, electrical, and plumbing system design.
  - Equipment specifications for all-electric appliances and building end-uses
  - Energy asset integration design, including emerging energy technologies, solar microgrids, demand flexibility components, and Electric Vehicle Supply Equipment (EVSE).
  - Any additional pro-environmental factors.
- Develop a *Demand Flexibility Installation and Evaluation Plan* that includes but is not limited to:
  - Preliminary system installation plans for load management controls and data visualization.
  - Preliminary load management performance metrics.
  - Investigating opportunities and methods to access local IOU demand flexibility signals to support load control demonstration.
  - Identifying grid data sources, e.g., California Independent System Operator, for developing load control parameters for grid operation status and forecast, time-dependent electricity price data, renewable energy generation and over-generation, and the carbon intensity of the hourly electricity supply.

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- Develop a plan to collect and analyze site-specific data and documentation that can establish the baseline and inform demand flexibility evaluation. Data may include occupancy statistics, residents' baseline electricity usage, residents' behavioral responses to demand flexibility measures, and electricity bills.
- Provide the *Final EVSE Design Plan* to ensure that at least 20% of the parking spaces can respond to grid signals and all remaining parking spaces are EV-ready. The Final EVSE Design Plan includes details on:
  - Types and number of charging equipment, ownership model, payment structures, networking requirements, data collection, and estimated costs.
  - Compliance with local and state codes.
- Based on the final designs of energy assets, provide final results in the *Build-Phase Building Energy and Emissions Performance Workbook*.
- Validate and refine the design of overall Selective Interconnection Service System electrical design.
- Ensure that site controller integrates and controls the BTM end-uses, EV, PV, BESS and other grid hardware.
- Validate BESS and PV requirements for supplying the engineered equipment package.
- Develop functional specifications for BESS and operating modes as well as technical specifications for BESS vendor selection.
- Prepare a Detailed *Site and Solution Engineering Design Report* which intends to include final outcomes of any form of design and/or value engineering activities before construction commences and therefore would include building electrification and DER technologies that are intended to be installed in the community such as:
  - Final Design Plans such as Mechanical and Electrical Plans
  - Building Electrification Technologies to be installed.
  - Electric Vehicle Charging equipment
- Work with PG&E on the Selective Standby Service Interconnection Arrangement Request
- Develop an *Interconnection Report* to show how community developers can work with their local utilities on interconnecting similar communities to the grid.
- Determine with PG&E what design (hardware or software or a combination of both) is expected to have the fastest path towards PG&E's interconnection approval for the project
- Conduct performance testing of the Selective Interconnection Service System before operational commissioning and detail findings in a *Performance Evaluation of the Selective Interconnection Service System Memo*.
- Provide a *Permission to Operate (PTO)* from the utility.
- Participate in CPR and prepare a *CPR Report*.

**Products:**

- Final Design Plans
- Demand Flexibility Installation and Evaluation Plan (Draft and Final)
- Final EVSE Design Plan
- Build-Phase Building Energy and Emissions Performance Workbook
- Site and Solution Engineering Design Report
- Interconnection Report
- Performance Evaluation of the Selective Interconnection Service System
- Permission to Operate

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- CPR Report

**TASK 3 – FINANCE**

The goals of this task are to obtain commitments from debt and equity partners to close on construction financing necessary to fund the project. This task will also provide evidence that the project has secured all necessary regulatory approvals and incentives needed to begin construction.

**The Recipient shall:**

- Execute a *Commitment Letter* from construction debt lender(s)
- Execute a *Commitment Letter(s)* from tax credit equity investors(s)
- Execute *Commitment Letters* from any additional soft lender(s) needed to fill financing gaps
- Close escrow on construction financing
- If needed, apply for state incentives for energy components, such as BUILD incentive, SGIP, etc., and obtain *Approval Letters of State Incentives for Energy Components (if applicable)*.

**Products:**

- Commitment Letter from construction debt lender(s)
- Commitment Letter from tax credit equity investor(s)
- Commitment Letter(s) from any additional soft lender(s)
- Approval Letters of State Incentives for Energy Components (if applicable).

**TASK 4: TECHNOLOGY PROCUREMENT, INSTALLATION AND COMMISSIONING**

The goal of this task is to procure, construct, and commission the required equipment, energy assets, and materials as identified in the final development design following the EPIC grant design requirements.

***Subtask 4.1 – Planning and Procurement***

The goal of this subtask is to procure equipment and materials, and complete construction of the energy asset and microgrid components needed to generate, store, and distribute power.

***Subtask 4.1.1 Planning and Procurement of the Microgrid***

**The Recipient shall:**

- Engage vendors and execute bid documents.
- Prepare *Microgrid Procurement Plan Memorandum* detailing equipment, the anticipated timeline for delivery, and remediation plan for equipment delay as applicable.
- Procure all equipment, materials, and technology including but not limited to:
  - Solar photovoltaics system.
  - Battery energy storage system.
  - Other microgrid components, such as microgrid central controller, interconnection switch package, grid-forming inverters, telemetry devices, visualization software, and monitor displays.
- Prepare a *Microgrid Engineering Design Report* that includes sizing, specifications, integration of the energy components and loads, microgrid operation logic, annual costs,

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savings, value of resilience (if any), revenue (if any), and overall feasibility. This report will also detail the operation and maintenance strategy and how they integrate with the distribution infrastructure.

**Products:**

- Microgrid Procurement Plan Memorandum
- Microgrid Engineering Design Report

***Subtask 4.1.2 Planning and Procurement of Demand Flexibility Equipment and EVSE***

**The Recipient shall:**

- Engage vendors and obtain vendor contract(s).
- Prepare *Demand Flexibility Equipment Procurement Plan Memorandum* detailing equipment, the anticipated timeline for delivery, and remediation plan for equipment delay as applicable.
- Procure all equipment, materials, and technology including but not limited to:
  - Automated demand flexibility-related equipment and technologies such as electric vehicle charging stations with demand flexibility capabilities.
  - Manual demand flexibility-related equipment and technologies, such as in-unit tablets or mobile apps used for immediate changes by customers for load management and demand flexibility events, Wi-Fi-enabled thermostats, and smart plugs for devices to be controlled remotely.
- Summarize the final procurement details in the *Final Demand Flexibility Equipment Procurement Memorandum*, including but not limited to the vendors, models, operation strategy, and costs of all demand flexibility-related components.
- Prepare *EVSE Procurement Plan Memorandum* detailing EVSE equipment (and EVs if applicable), the anticipated timeline for delivery, and remediation plan for equipment delay as applicable.
- Procure all equipment, materials, and technology including but not limited to EVSE to meet or exceed the solicitation's minimum requirements.
- Procure EV(s) with V2G or V2B capabilities.

**Products:**

- Demand Flexibility Equipment Procurement Plan Memorandum
- Final Demand Flexibility Equipment Procurement Memorandum
- EVSE Procurement Plan Memorandum

***Subtask 4.2 – Construction and Implementation***

The goal of this subtask is to complete and report on all construction activities.

**The Recipient shall:**

- Prepare and submit an *Installation Plan Memorandum* including but not limited to:
  - A list of installation milestones for the grant-funded energy assets, including emerging energy technologies, demand flexibility technologies, the microgrid, and EVSE.
  - A detailed installed schedule for the technologies listed above.
- Implement all other aspects of the Installation Plan.
- Prepare and provide a *Written Notification of Completion of Installation*.
- Prepare and submit an *Installation Report* to include the following:

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- A final schedule of completed milestones.
- A description of lessons learned, including a summary of major project changes from the original design, as applicable.
- Based on the final installation costs and applicable tariffs of grant-funded energy assets, provide an updated *Build-Phase Zero-Emission Cost-Benefit Analysis Report*, showing results with and without grant funding and other incentives.

**Products:**

- Installation Plan Memorandum
- Written Notification of Completion of Installation
- Installation Report
- Build-Phase Zero-Emission Cost-Benefit Analysis Report

***Subtask 4.3 – Commissioning***

The goals of this subtask are to finalize the construction process, commission the grant-funded energy assets, and interconnect with the local major investor owner utility.

**The Recipient shall:**

- Perform necessary development and testing to receive utility signals for grid-interactive energy components, such as bidirectional EV charging, demand flexibility, and the microgrid.
- Prepare and submit a *Commissioning Report* which will, at a minimum, confirm that the grant-funded energy assets have been successfully put into operation, describe the results of the interconnection, metering arrangement, and system commissioning process and highlight any unique challenges or lessons faced with bringing the development's system online.
- Obtain a *Certificate of Occupancy and Notice of Completion* before the end term of the build phase agreement.
- Prepare a *Rent Schedule*, showing the rents for affordable and/or low-income units and confirming that the development dedicates a minimum of 20% of the total units to affordable housing with at least 10% of the total units being dedicated to lower-income units or providing evidence of local affordability requirements.
- Obtain a *Title Report or Deed*, showing evidence of deed restrictions (if applicable).
- Participate in CPR and prepare a *CPR Report*.

**Products:**

- Commissioning Report
- Certificate of Occupancy and Notice of Completion
- Rent Schedule
- Title Report or Deed
- CPR Report

**TASK 5: MEASUREMENT AND VERIFICATION**

The goal of this task is to complete the analysis and reporting portion of the project. After the homes are occupied and the monitoring systems are installed, the data gathered will be used to conduct cost, energy, and GHG effectiveness evaluations of individual measures (including

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environmental measures), technology packages and whole home operation as well as the operation of the BESS, PV, and EV chargers.

**The Recipient shall:**

- Develop a *Measurement and Verification Plan* in order to quantify energy impacts as well as assess emerging technology performance of advanced building electrification as well as DER technologies and environmental measures. The *Measurement and Verification Plan* will include but not be limited to:
  - A description of the monitoring equipment and instrumentation that will be used at each site.
  - A description of the key input parameters and output metrics that will be measured.
  - Identification of required data acquisition criteria, such as sampling frequency for various parameters.
  - A description of the analysis methods to be employed. Analysis methods will allow for measurement of all performance criteria listed in the Agreement Objectives section of this Scope of Work.
  - Independent, third-party measurement and verification services to be employed, if applicable.
  - Identification of additional information that will be necessary to complete the measurement and verification task (e.g., costs for implementing baseline design vs. proposed design).
  - Identification of system operating modes and/or procedures to enable comparison of the baseline design vs. proposed design.
- Test monitoring systems and ensure that data is being received and stored appropriately.
- Collect data on home energy use from monitored whole home data
- Collect data on BESS, PV, EV Chargers, and site controller performance.
- Collect data on Grey Water re-use and other environment performance.
- Develop a *Community Update and Results Report* which will evaluate the performance of energy efficiency and environmental measures, BESS, PV, and EV Charger Performance, and Site Controller functionality as defined in the *Project Case Study* in Task 7.
- Prepare performance evaluations and data analysis for project quarterly reports.
- Engage a third party to prepare a *Third-Party Measurement and Verification Report* to document the following items:
  - The operational performance, including operational constraints, interactions with the grid, and response to grid emergencies.
  - Barriers and solutions to the deployment of the emerging energy technologies, demand flexibility technologies, the microgrid, and EVSE, including but not limited to technical complications, operational considerations, financing options, permitting requirements, and regulatory activities.
  - Measurements showing achievement of the project goals and objectives.
- Participate in CPR and prepare a *CPR Report*.

**Products:**

- Draft and Final Measurement & Verification Plan
- Community Performance Update and Results Report
- Third-Party Measurement and Verification Report

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- CPR Report

**TASK 6: COMMUNITY ENGAGEMENT**

The goals of this task are to work with local Community Based Organizations (CBO) to provide community education (tenants, Property Managers/Staff, and local community) on the uniqueness of the community, personal energy use, and total energy burden as well as conduct tenant surveys on their energy use and their community experience.

**The Recipient shall:**

- Engage with CBOs on implementing the Community Engagement Plan developed in the Design Phase.
- Develop *Tenant and Property Management Training Modules*.
- Work with local CBO to host semi-annual “*Carbon Conversations*” *Workshops* which will involve presentations or in person workshops focused on electrification, energy consumption, public transportation training, water reduction methods, and other technologies featured within the community. These workshops will be available for public attendance.
- Conduct Community Surveys which could include customer-centered surveys, interviews, and focus group sessions of the building occupants to understand how the building occupants are changing their thought processes in terms of their use of electricity, and if they are changing their energy consumption methods.
- Analyze data and publish findings from surveys in a *Community Survey Report* detailing the analysis.
- Update the Community Engagement Plan. The tenant surveys, interviews, and focus groups results will be utilized form the *Updated the Community Engagement Plan*. This plan will include how the general community is responding, tenant experiences, and recommendations on potential community improvements.

**Products:**

- Tenant and Property Management Training Modules
- “Carbon Conversations” Workshops
- Community Survey Report
- Updated Community Engagement Plan

**TASK 7: EVALUATION OF PROJECT BENEFITS**

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

**The Recipient shall:**

- Complete the *Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with ‘Kick-off’ selected for the ‘Relevant data collection period’ and submitted to the CAM for review and approval.
- Complete the *Annual Survey* each year. The Annual Survey includes but is not limited to the following information:
  - Technology commercialization progress
  - New media and publications
  - Company growth
  - Follow-on funding and awards received

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- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile at least once a year at a minimum by January 31<sup>st</sup> every year on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

**Products:**

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

**TASK 8: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES**

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

**The Recipient Shall:**

- Develop and submit a *Project Case Study Plan (Draft/Final)* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The *Project Case Study Plan* should include:
  - An outline of the objectives, goals, and activities of the case study.
  - The organization that will be conducting the case study and the plan for conducting it.
  - A list of professions and practitioners involved in the technology's deployment.
  - Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
  - Presentations/webinars/training events to disseminate the results of the case study.
- Present the *Draft Project Case Study Plan* to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Project Case Study Plan*. This document will identify:
  - TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.



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- TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the *Final Project Case Study Plan* to the CAM for approval.
- Execute the *Final Project Case Study Plan* and develop and submit a *Project Case Study (Draft/Final)*. The Project Case Study should include:
  - A description of the business model and financial strategy for procuring and maintaining the advanced energy elements.
  - An explanation on how the business model could be replicable for future developments without access to grant funding.
  - Demonstration of residential and commercial occupant bill savings.
  - Demonstration of additional benefits such as construction time and cost savings and how the benefits are passed along to the occupants.
  - Explanation of how the mixed-use development leveraged advanced construction practices to save time and cost.
  - Identifying specific components (e.g., technological, financial, regulatory) of the demonstrated project that need improvement/advancement to increase future deployment of zero-emission, mixed-use developments.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Develop a *Community Two-page flier* which will describe the community and the innovative technologies which include the novel selective interconnection service electrical infrastructure, electrification & reduced-energy consumption measures, water reduction methods used at the facility, and other technologies featured within the community.
- Conduct Project Site Tours and Submit Documentation of Project Site Tours offered to Industry Stakeholders
- Create a brief 3–5-minute *Project Video* highlighting your project.
  - Describe what is innovative and exciting about the project and successful progress made to date.
  - Discuss the role EPIC funding played in advancing the project.
  - Describe its impacts to California and its electric ratepayers.
  - Include testimonials from at least 1-2 potential end-use customers or external entities on the value of the project

**Products:**

- Project Case Study Plan (Draft/Final)
- Summary of TAC Comments
- Project Case Study (Draft/Final)
- High Quality Digital Photographs

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- Community Two-Page Flier
- Yearly Project Site Tours
- Documentation of Project Site Tours to Industry Stakeholders
- Project Video

**IV. PROJECT SCHEDULE**

Please see the attached Excel spreadsheet.