



California
ENERGY COMMISSION



**California Energy Commission
October 19, 2026 Business Meeting
Backup Materials for The Regents of the University of California, on behalf of its
Riverside campus**

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

CALIFORNIA ENERGY COMMISSION

PROPOSED RESOLUTION: The Regents of the University of California, on behalf of its Riverside campus

RESOLUTION NO: 26-1019-XX

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-26-010 with The Regents of the University of California, on behalf of its Riverside campus for a \$3,483,212 grant. This grant will fund the deployment, integration, and multi-substation field demonstration of a utility-integrated virtual power plant that orchestrates inverter-based distributed energy resources, to deliver distribution-level services across multiple PG&E substations and feeders serving disadvantaged communities under real-world operating conditions to avoid feeder-level and substation-level constraint violations; and

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

APPROVED AND ADOPTED this 19 day of October 2026, by the following vote:

AYE:

NAY:

ABSENT:

ABSTAIN:

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 approved and adopted by affirmative vote of the CEC at a meeting held on October 19, 2026.

Kim Todd
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-26-010

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Liet Le
3. MS-:None
4. Phone Number: 916-232-6331

C. Recipient's Information

Recipient's Legal Name: The Regents of the University of California, on behalf of its Riverside Campus

D. Title of Project

Title of project: Coordinated VPP for Distribution-Level Services

E. Term and Amount

1. Start Date: 11/2/2026
2. End Date: 11/1/2030
3. Amount: \$3,483,212.00

F. Business Meeting Information

1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 10/19/2026
3. Consent or Discussion? Consent
4. Business Meeting Presenter Name: Liet Le
5. Time Needed for Business Meeting: 5 minutes.
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

Project Description:

The Regents of the University of California, on behalf of its Riverside Campus. Proposed resolution approving agreement EPC-26-010 with The Regents of the University of California, on behalf of its Riverside campus for a \$3,483,212 grant and adopting staff's recommendation that this action is exempt from CEQA. This grant will fund the deployment, integration, and multi-substation field demonstration of a utility-integrated virtual power plant that orchestrates inverter-based distributed energy resources, to deliver distribution-level services across multiple PG&E substations and feeders serving disadvantaged communities under real-world operating conditions to avoid feeder-level and substation-level constraint violations. (EPIC funding)
Contact: Liet Le

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":

If Agreement is considered a "Project" under CEQA answer the following questions.

a) Agreement **IS** exempt?

Yes

Statutory Exemption?

No

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

PRC section number: None

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

Categorical Exemption?

Yes

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

CCR section number: Cal. Code Regs., tit. 14, § 15301 provides that projects which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alternations of existing public or private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of existing or former use at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act (CEQA). This project involves installing behind-the-meter sensors and other upgrades within existing electrical boxes at select locations. These activities do not require discretionary permits and involve negligible or no expansion of the existing use. Therefore, this project falls within Section 15301 and will not have a significant effect on the environment.

Additionally, this project does not involve impacts on any particularly sensitive environment; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2.

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.

Not applicable

b) Agreement **IS NOT** exempt.



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

Not applicable

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

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

H. Is this project considered “Infrastructure”?

No

I. Subcontractors

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

Delete any unused rows from the table.

Subcontractor Legal Company Name	CEC Funds	Match Funds
Olivine, Inc.	\$ 1,280,823	\$960,149
Qualus, LLC	\$ 60,295	\$3,514
GRID Alternatives	\$ 149,740	\$0
Agmonitor Inc.	\$ 25,000	\$0

J. Vendors and Sellers for Equipment and Materials/Miscellaneous

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

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

K. Key Partners

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

Key Partner Legal Company Name
Pacific Gas and Electric Company (PG&E)



L. Budget Information

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

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	25-26	301.001M	\$ 3,483,212

TOTAL Amount: \$ 3,483,212

R&D Program Area: ESB: Renewables

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: Not applicable

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Tim Wolfe

Address: 245 University Office Building

City, State, Zip: Riverside, CA 92521-0217

Phone: 951-827-5547

E-Mail: twolfe@ucr.edu

2. Recipient's Project Manager

Name: Hamed Mohsenian-Rad

Address: 900 University Ave, Winston Chung Hall, Room 436

City, State, Zip: Riverside, CA 92521

Phone: 951-827-2387

E-Mail: hamed@ee.ucr.edu

N. Selection Process Used

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

Selection Process	Additional Information
Competitive Solicitation #	GFO-25-302
First Come First Served Solicitation #	Not applicable
Other	Not applicable



O. Attached Items

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

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

Approved By

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

Agreement Manager: Liet Le

Approval Date: 8/28/26

Branch Manager: Kevin Uy

Approval Date: 8/31/26

Director: Jonah Steinbuck

Approval Date: *Delegated to Branch Manager*

EXHIBIT A
Scope of Work
The Regents of the University of California, Riverside on behalf of its
Riverside Campus

I. TASK AND ACRONYM/TERM LISTS

A. Task List

Task #	CPR¹	Task Name
1		General Project Tasks
2		Disadvantaged Community Input and Community Outreach and Engagement
3	X	Initial Grid Simulations and Baseline Assessments
4		Analytical Service Compensation Frameworks for Distribution-level Services
5		Sites and IBDER Assets Readiness and Customer Readiness
6	X	VPP Technology Deployment and Implementation
7	X	VPP Technology Integration with PG&E
8		Technology Demonstration, Field Operation, and Data Collection
9		Third Party Measurement and Verification
10		Evaluation of Project Benefits
11		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
BESS	Battery energy storage systems
BYOT	Bring Your Own Technology
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CBO	Community-Based Organization
CEC	California Energy Commission
CPR	Critical Project Review
DAC	Disadvantaged community
DERMS	Distributed energy resource management system
EMS	Energy Management System
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
GIS	Geographic Information System
GFO	Grant Funding Opportunity
IBDER	Inverter-based distributed energy resource
IOU	Investor-owned utility
KW / KWH	Kilowatt / Kilowatt Hour
M&V	Measurement and Verification
PG&E	Pacific Gas and Electric
PV	Photo-Voltaic
TAC	Technical Advisory Committee
VPP	Virtual Power Plant

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.

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the deployment, integration, and multi-substation field demonstration of a utility-integrated Virtual Power Plant (VPP) that orchestrates inverter-based distributed energy resources (IBDERs), including battery energy storage system (BESS), electric vehicle supply equipment (EVSE), and photovoltaic (PV), to deliver distribution-level services across multiple PG&E substations and feeders serving Disadvantaged Communities (DACs). The project also includes pre-installation grid simulations and baseline assessments, the development of analytical service compensation frameworks for distribution-level services, and DACs input and community outreach and engagement activities.

B. Problem/ Solution Statement

Problem

California's electric distribution system is seeing rapid growth in IBDERs, including BESS, EVSE, and PV, driven by electrification, decarbonization mandates, and increasing demand. However, these resources are not yet systematically recruited or operated as reliable, coordinated, and utility-integrated assets capable of delivering distribution-level grid services in practice. To date, most VPPs have focused on load management and bulk power services for wholesale market participation, with dispatch decisions driven by wholesale signals and limited consideration of feeder- and substation-level operating conditions, resulting in no demonstrated capability to deliver distribution-level services. As a result, a critical gap remains in the real-time coordination of heterogeneous IBDERs to support local distribution system needs, particularly at the substation and feeder level serving DACs.

Several barriers have prevented this capability from being realized at scale, including: **(1)** lack of operational demonstrations of distribution-level VPP services under real-world utility conditions; **(2)** limited integration and interoperability between VPP platforms and utility control systems; **(3)** absence of compensation and valuation models for distribution-level services, in contrast to mature wholesale market mechanisms; **(4)** insufficient baseline assessments to inform feeder-level and substation-specific VPP deployment strategies; and **(5)** barriers to equitable enrollment, participation, and benefit realization for customers in Disadvantaged Communities.

Solution

This project addresses the above barriers by deploying and demonstrating a utility-integrated VPP that delivers distribution-level grid services under real-world operating conditions, including localized line congestion mitigation, reactive power support, power quality improvement, and coordinated electric vehicle (EV) charging/charging curtailment to avoid feeder-level and substation-level constraint violations.

The localized VPPs are formed through coordination of heterogeneous IBDERs, namely BESS, EVSE, and PV assets enrolled in Olivine's Climate Response VPP program, across

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multiple PG&E substations and feeders that exhibit diverse electrical characteristics and operating conditions, while all serving DACs. Pre-installation distribution power grid simulations and baseline assessments will be conducted to identify feasible distribution-level services, operational limits, and site-specific constraints prior to deployment.

The proposed VPP is architected to support secure, standards-based communication with PG&E systems, leveraging PG&E's existing infrastructure and building on Olivine's proven cloud-to-cloud, vendor-agnostic integration architecture. Such integration enables the VPP to receive distribution-level dispatch signals and coordinate asset operations while respecting feeder-level and substation-level constraints. The platform supports heterogeneous site controllers and mixed asset vendors without custom rewrites, enabling scalable deployment across diverse sites.

To address the absence of existing compensation mechanisms for distribution-level services, the project also develops an analytical service valuation and compensation framework that quantifies the locational or temporal value of VPP-delivered services. These frameworks are designed to be compatible with utility operations and future distribution-level procurement models, enabling transparent evaluation of grid benefits and pathways for scalable adoption beyond the pilot.

The project conducts a full-year field demonstration with independent third-party measurement and verification. Community outreach will ensure equitable benefits for DAC customers, supported by Olivine's VPP participation model that lowers enrollment barriers and supports diverse customer-owned assets. Together, these elements establish a replicable, low-risk model for distribution-level VPP services that advances California's statutory goals for grid reliability, affordability, decarbonization, and equity.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Implement the utility-integrated, distribution-level Climate Response VPP capable of coordinating heterogeneous IBDERs, including BESS, EVSE, and PV assets, across multiple PG&E feeders and substations serving DACs.
- Conduct pre-installation grid simulations and baseline assessments to identify feeder-level and substation-level operational constraints, feasible distribution-level services, and site-specific operating limits that inform VPP configuration and dispatch strategies across feeders with diverse electrical characteristics and asset densities.
- Demonstrate localized distribution-level grid services, based on the available resources and the specific target service(s) at each site, such as line congestion mitigation, reactive power support and the corresponding power quality improvement, and coordinated EV managed charging, on a demonstration basis under realistic utility operating conditions, through coordinated control of multiple assets, with support from PG&E utility systems.
- Integrate the VPP with PG&E's control and management platforms using secure, standards-based interfaces, with PG&E providing support to evaluate message exchanges and demonstration-level interoperability, enabling

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exchange of dispatch signals and operational constraints for feeder- and substation-level coordination.

- Deploy and validate VPP control and decision-making methods, including forecasting and optimization, to allocate IBDER responses in compliance with distribution constraints while enhancing distribution-level reliability and performance.
- Demonstrate scalable and interoperable VPP operation on multiple substations and feeders with diverse electrical characteristics, asset densities, and spatial configurations, enabled by vendor-agnostic integration and cloud-based coordination, establishing a pathway for broader deployment across California's distribution system.
- Execute a full-year field demonstration to evaluate VPP performance, availability, responsiveness, and seasonal robustness, supported by independent third-party measurement and verification, including performance during periods of system stress.
- Advance analytical frameworks for valuing distribution-level grid services, including quantification of their locational or temporal value for localized VPP services.
- Engage the demonstration sites at the DAC communities through targeted outreach and enrollment activities, led by the Community-based Organization (CBO), ensuring equitable participation and meaningful local benefits. including education on Olivine's VPP participation model.
- Generate transferable technical, operational, and institutional knowledge to inform broader deployment of utility-integrated, distribution-level VPPs in California.

Ratepayer Benefits:² This Agreement delivers clear and measurable benefits to California IOU ratepayers. Reliability, resiliency, and power quality are improved on stressed feeders serving Disadvantaged Communities (DACs), many of the feeders that are identified for this project operate at zero or near-zero remaining hosting capacity, reflecting limited operational headroom under realistic loading and contingency conditions. Coordinated VPP control of IBDERs mitigates localized congestion, prevents feeder and transformer overloads, and effectively increases available capacity through non-wires alternatives, thereby reducing voltage violations and improving distribution system operational reliability. Affordability is enhanced by deferring or avoiding costly traditional distribution upgrades, such as reconductoring and transformer replacements, that would otherwise be recovered through rates, while also reducing operational costs associated with emergency diesel or gas generation during peak congestion events.

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).

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Safety benefits arise from maintaining loading and operating conditions within design limits, reducing the risk of transformer failures, fires, and downed conductors, and lowering the need for manual utility interventions and crew dispatch. Equity and community benefits are realized by prioritizing substations and feeders serving the proposed sites at DACs that experience disproportionate reliability and power quality challenges, enabling DAC ratepayers with IBDERs to participate in and benefit from distribution-level services, and supporting community outreach, workforce awareness, and engagement led by the CBO, including participation by local, DAC-based small businesses and woman-owned contractors. Emissions and public health benefits result from reduced reliance on high-emission emergency generators, improving local air quality and reducing exposure to diesel and gas combustion in DAC neighborhoods.

Technological Advancement and Breakthroughs:³ This Agreement will lead to technological advancement and breakthroughs by demonstrating, at multi-substation and utility-relevant scale, a distribution-level VPP that coordinates heterogeneous IBDERs across multiple feeders and substations (*all* located in DACs) with diverse electrical and operational characteristics to deliver localized grid services under real-world operating conditions. The demonstration focuses on stressed distribution feeders, including several with zero or very limited remaining load hosting capacity, where traditional infrastructure solutions are costly or slow to deploy. The project advances beyond traditional bulk-system VPP applications by integrating forecast-informed, constraint-aware asset coordination with feeder- and substation-aware control to address local congestion, voltage, and operating constraints on distribution circuits.

In addition, the project demonstrates a vendor-agnostic interoperability and enrollment capability that supports integration of diverse asset types and manufacturers across multiple feeders serving Disadvantaged Communities, including rural and semi-rural areas with differing grid conditions and operational challenges. The Agreement establishes secure, standards-based utility interface capabilities to exchange and act on utility-initiated service requests on a demonstration basis without modifying PG&E production systems or workflows. The project further advances compensation-relevant analytical valuation methods by producing locational or temporal insights into the value and relative contribution of distribution-level services from individual and coordinated IBDER responses, providing a practical technical pathway for scalable, utility-aligned programs in DAC-served distribution networks. temporal insights into the value and relative contribution of distribution-level services from individual and coordinated IBDER responses, providing a practical technical pathway for scalable, utility-aligned programs in DAC-served distribution networks.

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.

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Agreement Objectives

The objectives of this Agreement are to achieve the following technological advancements and breakthroughs by demonstrating the following specific, measurable project outcomes:

- **Utility-Integrated, Distribution-Level VPP Dispatch Across Multiple Substations:** Demonstration of a VPP capable of coordinating heterogeneous IBDERs (BESS, EVSE, and PV) across multiple PG&E feeders and substations to deliver localized distribution-level services—such as congestion mitigation, voltage and reactive power support, and coordinated EV charging management—under real utility operating conditions.
- **Feeder-Aware and Substation-Aware Coordinated Dispatch Informed by Grid Baseline Modeling:** Demonstration that pre-installation grid simulations and baseline assessments can be used to identify feeder- and substation-level constraints and inform VPP configuration, dispatch strategies, and service feasibility across circuits.
- **Multi-Vendor Interoperability at the Distribution Level:** Validation of a vendor-agnostic VPP architecture that integrates and coordinates multiple asset types and manufacturers within a single operational framework, enabling scalable “bring-your-own-technology” enrollment in the future without bespoke device rewrites or proprietary site controllers.
- **Utility-Integrated Dispatch Using Existing Utility Message Exchange Infrastructure:** Demonstration of secure, standards-based integration between the VPP and PG&E systems that enables receipt and execution of utility-initiated grid service requests using existing utility communication pathways, on a demonstration basis and without modifying PG&E production systems or workflows.
- **Forecast-Informed, Constraint-Aware VPP Control for Distribution Services:** Deployment and testing of forecasting-informed and constraint-aware VPP control that coordinates asset responses while respecting device limits, customer constraints, and feeder- and substation-level operating conditions, supporting year-round dispatch events.
- **Analytical Valuation and Compensation Frameworks for Distribution-Level Services:** Development and application of analytical frameworks that quantify the locational or temporal value and relative contribution of distribution-level services delivered by individual and coordinated IBDER responses, generating compensation-relevant insights to inform future utility programs.
- **Operationally Mature VPP Performance Under Real-World Grid Conditions:** Execution of a full-year field demonstration with repeated dispatch events across varying operating conditions, supported by third-party measurement and verification to assess VPP availability, responsiveness, operational reliability, and service effectiveness.
- **Scalable and Equitable Deployment on Feeders Serving Disadvantaged Communities:** Demonstration of a replicable approach for deploying and operating distribution-level VPP services on feeders serving Disadvantaged Communities, including an enrollment platform and onboarding of customer-owned assets at the designated demonstration sites, with potential to support future enrollments beyond the project, community engagement, and participation by DAC-based small businesses.

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III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

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

The Recipient shall:

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

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

For products that require a final version only

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

For all products

- Submit all data and documents required as products in accordance with the following: Instructions for Submitting Electronic Files and Developing Software:
 - **Electronic File Format**
 - Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the California Energy Commission’s (CEC) software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick.

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

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
 - Text documents will be in MS Word file format, version 2007 or later.
 - Project management documents will be in Microsoft Project file format, version 2007 or later.
- **Software Application Development**
- Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
 - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
 - Visual Studio.NET (version 2008 and up). Recommend 2010.
 - C# Programming Language with Presentation (UI), Business Object and Data Layers.
 - SQL (Structured Query Language).
 - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
 - Microsoft SQL Reporting Services. Recommend 2008 R2.
 - XML (external interfaces).

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

MEETINGS

Subtask 1.2 Kick-off Meeting

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

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, and other CEC staff relevant to the Agreement. The Recipient's Project Manager and any other individuals deemed necessary by the CAM or the Project Manager shall participate in this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., Teams, Zoom), with approval of the CAM.

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The Kick-off meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Terms and conditions of the Agreement;
 - Invoicing and auditing procedures;
 - Travel;
 - Equipment purchases;
 - Administrative and Technical products (subtask 1.1);
 - CPR meetings (subtask 1.3);
 - Monthly Calls (subtask 1.5)
 - Quarterly Progress reports (subtask 1.6)
 - Final Report (subtask 1.7)
 - Match funds (subtask 1.8);
 - Permit documentation (subtask 1.9);
 - Subawards(subtask 1.10);
 - Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
 - Agreement changes;
 - Performance Evaluations; and
 - Any other relevant topics.
- Provide *Kick-off Meeting Presentation* to include but not limited to:
 - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
 - Project schedule that identifies milestones
 - List of potential risk factors and hurdles, and mitigation strategy
 - Provide an *Updated Project Schedule*, *Match Funds Status Letter*, and *Permit Status Letter*, as needed to reflect any changes in the documents.

The CAM shall:

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

Recipient Products:

- Kick-off Meeting Presentation
- Updated Project Schedule (if applicable)
- Match Funds Status Letter (subtask 1.8) (if applicable)
- Permit Status Letter (subtask 1.9) (if applicable)

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive CEC funding and, if so, whether any modifications should be made to the tasks, products, schedule, or

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budget. CPR meetings are a key opportunity for open and candid discussions between the CEC and the Recipient about project progress, challenges, and next steps. CPR meetings may also provide a forum for the Recipient to share project insights with interested CEC staff and CEC partners, at the CAM's discretion.

CPR meetings are typically scheduled at key inflection points in the project, as identified in the Task List on page 1 of this Exhibit. They should align with natural phase transitions, such as after design completion but before major procurement decisions, so that the CEC can make an informed Progress Determination based on project performance and risk. CPR meetings are generally conducted virtually but may be held at a project site, at the CEC, or another location, as determined by the CAM. Site visits are typical for demonstration projects or when in-person observation would enhance the CEC's understanding of project progress.

The CAM may schedule additional CPR meetings as needed to address emerging issues or concerns. The budget may be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase.

The Recipient shall:

- Prepare and submit a *CPR Presentation* for each CPR meeting, structured to (1) report on progress with respect to the Scope of Work, budget, and schedule; identify any risks or needed changes to the Agreement; provide justification for continued funding; and (2) share project insights and progress towards achieving the Agreement's goals and objectives.
- Attend the CPR meeting and deliver the CPR Presentation and any other requested material, as outlined in the CPR Agenda provided by the CAM.

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. The *CPR Agenda* will outline the structure and expectations for the *CPR Presentation*.
- Conduct each CPR meeting.
- Issue a *Progress Determination* summarizing the meeting, stating whether the project will continue, and identifying any potential modifications to the Agreement or its products. The *Progress Determination* may include conditions that the Recipient must meet for the project to continue to receive CEC funding.

Recipient Products:

- CPR Presentation(s) (draft and final)

CAM Products:

- CPR Agenda(s)
- Progress Determination(s)

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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 of the following Agreement closeout items:
 - Disposition of any procured equipment.
 - The CEC's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential products.
 - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide copies of *All Final Products* organized by the tasks in the Agreement.

Products:

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

MONTHLY CALLS, REPORTS AND INVOICES

Subtask 1.5 Monthly Calls

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

The objectives of this task are to verbally summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, to verify match funds are being proportionally spent concurrently or in advance of CEC funds or are being spent in accordance with an approved Match Funding Spending Plan, to form the basis for

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determining whether invoices are consistent with work performed, and to answer any other questions from the CAM. Monthly calls might not be held on those months when a quarterly progress report is submitted, or the CAM determines that a monthly call is unnecessary.

The CAM shall:

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

The Recipient shall:

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

Product:

- Email to CAM concurring with call summary notes.

Subtask 1.6 Quarterly Progress Reports and Invoices

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

The Recipient shall:

- Submit a Quarterly Progress Report to the CAM. Each progress report must:
- Summarize progress made on all Agreement activities as specified in the scope of work for the reporting period, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Progress reports are due to the CAM the 10th day of each January, April, July, and October. The Quarterly Progress Report template can be found on the ECAMS Resources webpage available at: <https://www.energy.ca.gov/media/4691>
- Submit a monthly or quarterly Invoice on the invoice template(s) provided by the CAM.

Recipient Products:

- Quarterly Progress Reports
- Invoices

CAM Product:

- Invoice template

Subtask 1.7 Final Report

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

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Subtask 1.7.1 Final Report Outline

The Recipient shall:

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

Recipient Products:

- Final Report Outline (draft and final)

CAM Products:

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

Subtask 1.7.2 Final Report

The Recipient shall:

- Prepare a Final Report for this Agreement in accordance with the approved Final Report Outline, Energy Commission Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:
 - Cover page (**required**)
 - Credits page on the reverse side of cover with legal disclaimer (**required**)
 - Acknowledgements page (optional)
 - Preface (**required**)
 - Abstract, keywords, and citation page (**required**)
 - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
 - Executive summary (**required**)
 - Body of the report (**required**)
 - References (if applicable)
 - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
 - Bibliography (if applicable)
 - Appendices (if applicable) (Create a separate volume if very large.)
 - Attachments (if applicable)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a Summary of TAC Comments on Draft Final Report received on the Executive Summary. For each comment received, the Recipient will identify in the summary the following:
 - Comments the Recipient proposes to incorporate.
 - Comments the Recipient does not propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.

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- Incorporate all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a Written Responses to Comments explaining why the comments were not incorporated into the final product.
- Submit the revised Final Report electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:

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

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBAWARDS

Subtask 1.8 Match Funds

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

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a Match Funds Status Letter that documents the match funds committed to this Agreement. If no match funds were part of the application that led to the CEC awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.
- If match funds were a part of the application that led to the CEC awarding this Agreement, then provide in the letter:
 - A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where

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the property is located.

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

Products:

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

Subtask 1.9 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients.

Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

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

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

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

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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 1.10 Obtain and Execute Subawards and Agreements with Site Hosts

The goals of this subtask are to: (1) procure and execute subrecipients and site host agreements, as applicable, required to carry out the tasks under this Agreement; and (2) ensure that the subrecipients and site host agreements are consistent with the Agreement terms and conditions and the Recipient's own contracting policies and procedures.

The Recipient shall:

- Execute and manage subawards and coordinate subrecipients activities in accordance with the requirements of this Agreement.
- Execute and manage site host agreements and ensure the right to use the project site throughout the term of the Agreement, as applicable. A site host agreement is not required if the Recipient is the site host.
- Notify the CEC in writing immediately, but no later than five calendar days, if there is a reasonable likelihood the project site cannot be acquired or can no longer be used for the project.
- Incorporate this Agreement by reference into each subaward.
- Include any required Energy Commission flow-down provisions in each subaward, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subaward terms.
- Submit a *Subaward and Site Letter* to the CAM describing the subawards and any site host agreement needed or stating that no subawards or site host agreements are required.
- If requested by the CAM, submit a draft of each *Subaward* and any *Site Host Agreement* required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed *Subaward* and any *Site Host Agreement*.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding subrecipient additions in the terms and conditions).

Products:

- Subaward and Site Letter
- Draft Subawards (if requested by the CAM)
- Draft Site Host Agreement (if requested by the CAM)
- Final Subawards (if requested by the CAM)
- Final Site Host Agreement (if requested by the CAM)

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TECHNICAL ADVISORY COMMITTEE

Subtask 1.11 Technical Advisory Committee (TAC)

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

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
 - Technical area expertise;
 - Knowledge of market applications; or
 - Linkages between the Agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support, and relationships with a national spectrum of influential leaders.
- Ask probing questions that ensure 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.

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The Recipient shall:

- Prepare a List of Potential TAC Members that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.12.
- Prepare a List of TAC Members once all TAC members have committed to serving on the TAC.
- Submit Documentation of TAC Member Commitment (such as Letters of Acceptance) from each TAC member.

Products:

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

Subtask 1.12 TAC Meetings

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

The Recipient shall:

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

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- Ask probing questions that ensure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:

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

Subtask 1.13 Project Performance Metrics

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

The Recipient shall:

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

Products:

- TAC Performance Metrics Summary
- Project Performance Metrics Results

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IV. TECHNICAL TASKS

TASK 2: Disadvantaged Community Input and Community Outreach and Engagement

The goal of this task is to lead community input, outreach, and engagement activities in DACs to gather community-driven recommendations and raise awareness of clean energy technologies, workforce development opportunities, and local economic benefits associated with the project. Community input will be documented to inform project design and implementation.

The Recipient shall:

- Identify and engage community leaders, residents, and local stakeholders in the targeted Disadvantaged Communities to explain the project and gather input on anticipated project benefits, opportunities, concerns, and potential risks.
- Document and summarize community input in the Report on *Disadvantaged Community Input and Recommendations*, which will inform the project team during both the design and implementation phases regarding potential negative impacts and mitigations.
- Plan and conduct community outreach and engagement activities to increase awareness and understanding of clean energy technologies, including how Virtual Power Plants operate and how customers may participate in future VPP enrollment opportunities, workforce development opportunities, and potential local economic benefits.
- As part of community outreach, communicate information regarding local economic participation associated with the demonstration phase, including the involvement of local, DAC-based small businesses and woman-owned contractors supporting installation and monitoring activities at select project sites.
- Implement outreach activities, including conducting two annual community engagement meetings, which may include educational or training sessions, distribution of informational materials, and facilitated site visits coordinated with the project team.
- Track and document outreach activities, including methods used, participation levels, key topics discussed, and outcomes, and present the documented results in the *Report on Disadvantaged Community Outreach and Engagement Activities*.

Products:

- Report on Disadvantaged Community Input and Recommendations (draft and final)
- Report on Disadvantaged Community Outreach and Engagement Activities (draft and final)

TASK 3: Initial Grid Simulations and Baseline Assessments

The goal of this task is to develop analytical baseline models through pre-installation power system simulations of selected PG&E substations and feeders serving DACs. These simulations and baseline assessments will be used to identify feasible distribution-level services, operational limits, and site-specific constraints prior to VPP deployment. The resulting baseline models will characterize the needs for services on the identified stressed feeders and substations and characterize needs for services such as localized line

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congestion mitigation, reactive power support, power quality improvement, and coordinated EV charging to avoid feeder-level and substation-level constraint violations, establishing baseline insights to inform the subsequent VPP demonstration.

The Recipient shall:

- Leverage available network models and other relevant utility information associated with the target demonstration substations and feeders to define the simulation environment, including substation and feeder topologies, asset locations, asset types, asset sizes, and relevant operating characteristics, in coordination with the project team and PG&E.
- Define representative simulation scenarios reflecting typical operating conditions and common stress conditions relevant to feeder- and substation-level constraints.
- Develop the *Pre-Installation Grid Simulation and Baseline Assessment Plan*, outlining simulation assumptions, data requirements, feeder and substation representations, and simulation scenarios for evaluating distribution-level services and operating conditions.
- Perform power system simulations and baseline analyses to characterize feeder- and substation-level operating conditions, identify stressed conditions, and assess operational limits relevant to distribution-level services.
- Evaluate the feasibility and potential role of distribution-level services, including localized line congestion mitigation, reactive power support, and coordinated EV charging management, under representative operating scenarios.
- Identify site-specific constraints that inform VPP configuration, and dispatch strategies in subsequent project tasks.
- Summarize baseline findings and insights to inform VPP design, demonstration planning, and subsequent analytical valuation activities, and document the results in the *Pre-Installation Grid Simulation and Baseline Assessment Results*.
- Prepare *CPR #1 Presentation* and attend the CPR Meeting, per task 1.3.

Products:

- Report on Pre-Installation Grid Simulation and Baseline Assessment Plan (draft and final)
- Report on Pre-Installation Grid Simulation and Baseline Assessment Results (draft and final)
- CPR #1 Presentation (draft and final)

TASK 4: Analytical Service Compensation Frameworks for Distribution-Level Services

The goal of this task is to develop analytical frameworks to quantify and compare the value of distribution-level grid services provided by individual and coordinated IBDER responses under varying operational conditions. The task focuses on valuing services as a function of location, operating conditions, and asset characteristics. These analytical valuation outputs form the basis for compensation-related insights by quantifying the relative contribution and value of services. The insights will support and inform subsequent project activities, including VPP implementation considerations, demonstration planning, and exploration of potential incentive and enrollment approaches.

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The Recipient shall:

- Define a set of representative distribution-level services to be evaluated for valuation and compensation-relevant analysis, informed by baseline conditions and stressed scenarios identified in Task 3, including services such as localized congestion mitigation, voltage support, reactive power support, and coordinated EV charging management.
- Develop formulations to quantify the value and relative contribution of distribution-level services, as a function of asset location, operating conditions, asset characteristics, and system constraints, considering both individual and coordinated IBDER responses.
- Incorporate analytical constructs inspired by marginal-cost concepts, where appropriate, to assess how the value and contribution of distribution-level services vary across locations and operating conditions, while maintaining methodological flexibility.
- Assess how service value and contribution vary across space and time under representative operating conditions.
- Develop the *Report on Distribution-Level Service Valuation Framework*, documenting the analysis, assumptions, valuation metrics, and scenario definitions used to assess distribution-level services and derive compensation-relevant insights.
- Apply the valuation framework across representative operating scenarios to generate comparative valuation and compensation-related insights for different services.
- Document the findings in the *Report on Distribution-Level Service Valuation Analysis and Insights*.

Products:

- Report on Distribution-Level Service Valuation Framework (draft and final)
- Report on Distribution-Level Service Valuation Analysis and Insights (draft and final)

TASK 5: Sites and IBDER Assets Readiness and Customer Readiness

The goal of this task is to prepare, validate, and readiness test demonstration sites and associated IBDERs for participation in the VPP. This task ensures that selected sites, assets, and customers are technically, operationally, and administratively ready for VPP operations and field demonstration activities. Activities include site readiness verification, communications, and message exchange validation, readiness testing and coordination with Olivine, PG&E and the project team to support a smooth transition into VPP deployment and operation.

The Recipient shall:

- Confirm demonstration sites based on site availability, customer participation confirmation, and alignment with project objectives.
- Assess the technical readiness of IBDER assets at each site, including for BESS, EVSE, and PV systems, by verifying asset configurations, control interfaces, communications capabilities, and alignment with applicable interconnection, interoperability, and cybersecurity requirements relevant to VPP participation.
- Leverage existing site and asset information, including prior inventories, and other relevant utility information and baseline assessments, while minimizing the need for site

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- modifications prior to demonstration activities.
- Perform communications readiness checks, including IBDER connectivity, data availability, latency, site controllers or gateways, and the VPP platform.
 - Identify site-specific readiness gaps or constraints, including hardware, software, communications, or operational limitations, and assess their implications for the types of distribution-level services each site can support.
 - Develop and deliver the Report on Customer Enrollment and Demonstration Sites Readiness, summarizing site-level readiness, asset characteristics, communications outcomes, identified constraints, and recommended actions to support transition into VPP deployment.
 - Coordinate customer enrollment and onboarding activities, including ensuring the enrollment platform is operational, confirming customer participation, documenting enrollment status, and establishing required records for enrolled sites.
 - Develop and deliver the *Report on Customer Enrollment and Onboarding and Demonstration Site Readiness*, documenting enrolled customers and sites, enrollment processes, confirmed participations.

Products:

- Report on Customer Enrollment and Demonstration Sites Readiness (draft and final)

TASK 6: VPP Technology Deployment and Implementation

The goal of this task is to deploy, and validate the VPP technology required to coordinate enrolled IBDER assets across multiple demonstration sites, feeders, and substations for delivery of distribution-level grid services. This task translates site readiness, and analytical insights from prior tasks into an operational VPP architecture capable of secure asset aggregation, coordinated dispatch, and feeder- and substation-aware control of IBDERs. Activities include high level VPP architecture and control documentation, asset and site integration testing, deployment of communications and control interfaces, and pre-demonstration testing of coordinated VPP operation to ensure technical readiness for utility-integrated field demonstration.

The Recipient shall:

- Deploy the overall VPP architecture, including system components, controls, data flows, and interfaces required to support coordinated operation of heterogeneous IBDERs (BESS, EVSE, and PV) across multiple sites, feeders, and substations, and document the structure in the *VPP Architecture, Control, and Optimization Report*.
- Identify the control and decision-making logic of the VPP that supports coordinated dispatch of the enrolled IBDERs for distribution-level services, incorporating feeder- and substation-level operational considerations and site-specific capabilities and constraints.
- Deploy forecasting, dispatching, and optimization functions within the VPP Platform to support coordinated asset control under representative operating conditions and constraints.
- Deploy the VPP platform and integrate enrolled assets, including configuration of asset interfaces, site controllers or gateways, secure communications, and cloud-based

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functions to enable aggregation and coordinated control across demonstration locations.

- Validate asset and site integration, including verification of control responsiveness, communications, data quality, and interoperability, and document integration outcomes in the *VPP Deployment and Asset and Site Aggregation and Integration Report*.
- Deploy distribution-level coordinated control functions that enable the VPP Platform to dispatch assets in a manner consistent with the intended feeder- and substation-level constraints, informed by baseline analyses and insights from prior tasks.
- Coordinate closely with PG&E and the project team to ensure that VPP deployment, control functions, and testing activities are consistent with utility operational expectations and support subsequent utility-integrated demonstration tasks.
- Conduct coordinated VPP Platform dispatch testing under representative operating and stress scenarios to evaluate control performance, coordination across assets and sites, and system responsiveness prior to utility-integrated field operation, and document testing results in the *Distribution-Level Coordinated Control and VPP Dispatch Testing Report*.
- Prepare *CPR #2 Presentation* and participate in a CPR Meeting per subtask 1.3.

Products:

- VPP Architecture, Control, and Optimization Report (draft and final)
- VPP Deployment and Asset and Site Aggregation and Integration Report (draft and final)
- Distribution-Level Coordinated Control and VPP Dispatch Testing Report (draft and final)
- CPR #2 Presentation (draft and final)

TASK 7: VPP Technology Integration with PG&E

The goal of this task is to integrate the project's VPP platform with PG&E systems on a demonstration basis to evaluate utility-integrated coordination, data exchange, and dispatch signaling for distribution-level services. The task focuses on establishing and validating secure communication interfaces and message exchanges between the VPP and PG&E platforms, consistent with PG&E's role as an IOU project partner. Activities support demonstration-level testing and evaluation of the VPP's ability to receive and respond to PG&E-initiated grid service requests, while operational obligations or modifying PG&E's existing utility operations to the extent possible.

The Recipient shall:

- Develop a *Utility Integration Plan* in coordination with PG&E, defining the scope, objectives, system interfaces, message types, and testing approach for demonstration-level integration between the VPP platform and PG&E systems, and document the plan in the *Utility Integration Plan and Interface Specification Report*.
- Identify and document secure, standards-based communication interfaces on a demonstration basis between the VPP platform and PG&E systems, consistent with PG&E capabilities and requirements, to support demonstration-level exchange of dispatch signals, and operational information.

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- Coordinate with PG&E to evaluate demonstration-level interoperability, including message exchanges, signal formats, data flows, timing, and system interactions, and configure the VPP platform to receive and respond to PG&E-issued grid service requests for the purpose of assessing utility-integrated coordination and delivery of distribution-level services during testing and demonstration activities.
- Conduct integration testing and readiness assessments to verify that the VPP platform can reliably exchange data and respond to utility signals under representative operating conditions, and document integration status and readiness outcomes in the *Utility-VPP Interface Implementation and Integration Readiness Report*.
- Coordinate closely with PG&E and the project team throughout integration activities to ensure alignment with PG&E's role as an unfunded IOU partner and to avoid impacts to PG&E's pre-existing production systems, operational responsibilities, or regulatory obligations.
- Confirm demonstration-level utility-integrated dispatch and data exchange capability, in coordination with PG&E, to allow progress to full field demonstration, and document the results in the *Utility-Integrated Dispatch and Data Exchange Confirmation Report*.
- Prepare *CPR #3 Presentation* and participate in a CPR Meeting, per task 1.3.

Products:

- Utility Integration Plan and Interface Specification Report (draft and final)
- Utility-VPP Interface Implementation and Integration Readiness Report (draft and final)
- Utility-Integrated Dispatch and Data Exchange Confirmation Report (draft and final)
- CPR #3 Presentation (draft and final)

TASK 8: Technology Demonstration, Field Operation, and Data Collection

The goal of this task is to conduct a full-year field demonstration of the integrated VPP under real-world operating conditions and to collect operational and performance data to evaluate distribution-level service delivery. Building on site readiness, VPP deployment, and utility integration documented in prior tasks, this task focuses on operating the VPP to coordinate enrolled IBDERs across sites, feeders, and substations. Activities include executing coordinated dispatch events, monitoring system performance and availability, and collecting data to support performance assessment and independent third-party measurement and verification. The demonstration is conducted on a demonstration basis, consistent with PG&E's role as an unfunded IOU partner, while minimizing additional operational obligations or modifying existing utility operations to the extent possible and within the project team's control.

The Recipient shall:

- Operate the deployed VPP platform over a full-year demonstration period to coordinate enrolled IBDERs, including BESS, EVSE, and PV systems, across the selected demonstration sites, feeders, and substations.
- Execute coordinated dispatch events, as appropriate, during defined demonstration windows to deliver distribution-level grid services, consistent with service definitions, operating constraints, and integration arrangements established in prior tasks.
- Monitor VPP operations to assess system availability, responsiveness, and stability

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under representative operating conditions, including varying load levels, seasonal variations, and repeated dispatch events.

- Collect, track, and document operational and event data from enrolled assets and the VPP platform, including dispatch commands, asset responses, communications and availability metrics, observed operational limitations, and corrective actions taken, to support performance assessment and independent measurement and verification.
- Coordinate with the project team and PG&E throughout demonstration activities to ensure alignment with demonstration objectives and agreed-upon interfaces, while avoiding impacts to PG&E's pre-existing production systems or operational responsibilities to the extent possible and within the project team's control.
- Prepare and submit the *VPP Field Demonstration Mid-Year Operations Report*, summarizing interim operational status, dispatch activities, observed performance, and any implementation issues identified during the first half of the demonstration period.
- Prepare and submit the *VPP Field Demonstration Full-Year Operations Report*, documenting full-year VPP operation, dispatch activities, asset participation, and operational observations across the complete demonstration period.
- Prepare and submit the *VPP Field Demonstration Performance and Operational Reliability Report*, with performance metrics, availability, responsiveness, and operational reliability outcomes observed during the demonstration to support evaluation of VPP capabilities.

Products:

- VPP Field Demonstration Mid-Year Operations Report (draft and final)
- VPP Field Demonstration Full-Year Operations Report (draft and final)
- VPP Field Demonstration Performance and Operational Reliability Report (draft and final)

TASK 9: Third Party Measurement and Verification

The goal of this task is to conduct independent third-party measurement and verification (M&V) of the project's VPP demonstration outcomes in accordance with the requirements of the GFO. This task evaluates the performance, availability, responsiveness, and effectiveness of coordinated IBDER control through the VPP, as well as the resulting distribution-level grid services, using operational data generated during the field demonstration. All M&V activities are performed by an independent evaluating entity through data-driven analysis and verification, without involvement in VPP design, deployment, operation, site activities, or utility decision-making, thereby preserving evaluator independence.

The Recipient shall:

- Engage an independent third-party M&V provider to conduct all measurement and verification activities in accordance with the independence requirements of the GFO, ensuring separation from other project activities.
- Develop and submit the *Third-Party Measurement and Verification Plan*, defining evaluation objectives, performance metrics, data sources, baseline assumptions, assessment methods, and verification procedures to assess VPP availability, responsiveness, and distribution-level grid service performance during

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- demonstration.
- Coordinate with the project team, as needed, to clarify data formats and operational context in support of independent data analysis, without influencing M&V conclusions.
 - Conduct independent, data-driven analysis and verification of VPP performance and distribution-level service delivery outcomes, separate from operation/control activities.
 - Assess demonstration outcomes relative to defined baselines and evaluation criteria, documenting observed performance, operational limitations, and key findings relevant to the effectiveness of the VPP demonstration.
 - Prepare and submit the *Third-Party Measurement and Verification Report*, documenting performance results, evaluation findings, and lessons learned from the demonstration.
 - VPP Field Demonstration Mid-Year Operations Report

Products:

- Third-Party Measurement and Verification Plan (draft and final)
- Third-Party Measurement and Verification Report (draft and final)

TASK 10: EVALUATION OF PROJECT BENEFITS (*Mandatory task*)

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 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* if requested by the CAM. The survey covers, but is not limited to the following topics, as applicable to the project:
 - Changes in energy consumption, utility bills, and emissions
 - Public and private funding
 - Demonstration and deployment beyond the project Community engagement
 - Improvements in codes and standards
- Confirm and revise survey responses as directed by the CAM.
- 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 benefits questionnaire drafts.
- Complete the project profile on the CEC's public online project on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Initial Project Profile on EnergizeInnovation.fund*, including the profile link, to the CAM.
- Address any edits or questions from the CAM regarding the Energize Innovation Project Profile content.
- If the 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

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Documentation of Organization Profile on EnergizeInnovation.fund, including the profile link, to the CAM.

- If the Recipient's organizational profile is changed, update the organizational profile on the CEC's public online project and recipient directory on the [Energize Innovation website](http://www.energizeinnovation.fund) (www.energizeinnovation.fund), and provide a *Documentation of Updated Organization Profile on EnergizeInnovation.fund*, including the profile link, as needed.
- If the Recipient's project profile is changed, update the project profile on the CEC's public online project and recipient directory on the [Energize Innovation website](http://www.energizeinnovation.fund) (www.energizeinnovation.fund), and provide *Documentation of Updated ([Year]) Project Profile on EnergizeInnovation.fund*, including the profile link, to the CAM.
- Address any edits or questions from the CAM regarding the Project Profile content.

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)
- Final Project Benefits Questionnaire
- Documentation of Initial Project Profile on EnergizeInnovation.fund
- Documentation of Updated Organization Profile on EnergizeInnovation.fund (as needed)
- Documentation of Updated ([Year]) Project Profile on EnergizeInnovation.fund

TASK 11: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES (*Mandatory task*)

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

The Recipient Shall:

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

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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.
- When directed by the CAM, develop presentation materials for a CEC sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California CEC.
- Provide at least (6) six High-Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

Products:

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

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.