



California Energy Commission December 11, 2024, Business Meeting Backup Materials for Eos Energy Storage, LLC.

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

RESOLUTION NO: 24-1211-05

STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: Eos Energy Storage, LLC.

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 LDS-24-003 with Eos Energy Storage, LLC for an \$8,028,175 grant to fund deployment of a 1 MW/8 MWh non-lithium-ion long duration energy storage (LDES) system, and adopting staff's recommendation that this action is exempt from CEQA. The agreement will support Naval Base San Diego's Energy Resiliency Conservation Investment Program's renewable microgrid project, serving a portion of their critical facilities. The project aims to enhance energy resilience and serve as a blueprint for LDES system installations for renewable microgrids at naval facilities; 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 December 11, 2024.

AYE: NAY: ABSENT: ABSTAIN:

Dated:

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: LDS-24-003

B. Division Information

- 1. Division Name: ERDD
- 2. Agreement Manager: Caitlin Planchard
- 3. MS-:None
- 4. Phone Number: 9166378128

C. Recipient's Information

- Recipient's Legal Name: Eos Energy Storage, LLC
- 2. Federal ID Number: 32-0256144

D. Title of Project

Title of project: Demonstration of LDES to Support Naval Base San Diego Microgrid

E. Term and Amount

- 1. Start Date: 1/6/2025
- 2. End Date: 11/1/2030
- 3. Amount: \$8,028,175.00

F. Business Meeting Information

- 1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
- 2. The Proposed Business Meeting Date: 12/11/2024
- 3. Consent or Discussion? Discussion
- 4. Business Meeting Presenter Name: Caitlin Planchard
- 5. Time Needed for Business Meeting: 5 minutes
- 6. The email subscription topic is: Long Duration Energy Storage (LDES)

Agenda Item Subject and Description:

Eos Energy Storage, LLC.

Proposed resolution approving agreement LDS-24-003 with Eos Energy Storage, LLC for an \$8,028,175 grant to fund deployment of a 1 MW/8 MWh non-lithium-ion long duration energy storage (LDES) system, and adopting staff's recommendation that this action is exempt from CEQA. The agreement will support Naval Base San Diego's Energy Resiliency Conservation Investment Program's renewable microgrid project, serving a portion of their critical facilities. The project aims to enhance energy resilience and serve as a blueprint for LDES system installations for renewable microgrids at naval facilities. (LDES Funding) Contact: Caitlin Planchard (Staff Presentation: 5 minutes)

G. California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?

Yes



If yes, skip to question 2.

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

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

Yes

Statutory Exemption?

No

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

PRC section number:

CCR section number: None

Categorical Exemption?

Yes

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

CCR section number: tit. 14, § 15303

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.

Cal. Code Regs., tit. 14, sec. 15303 provides that projects which consist of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure, are categorically exempt from the provisions of CEQA. This project will consist of the installation, connection, and demonstration of modular long duration energy storage technologies at an existing military facility. Minor alteration of existing facilities and mechanical equipment in the form of reconfiguration of existing electrical infrastructure will take place before location of skid mounted modular energy storage units are brought into the existing facilities. Additional minor alterations to topographical features include minor grading and/or trenching for concrete pads. Therefore, this project falls within Section 15303.

Additionally, 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. 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
Michael Firenze Inc	\$ 340,200	\$ 0
Electric Power Research Institute, Inc.	\$ 90,000	\$ 0
TBD - Installation Contractor	\$ 1,200,000	\$ 0
TBD - Civil Engineering	\$ 750,000	\$ 0
TBD - Design Contractor	\$ 400,000	\$ 0
Naval Facilities Engineering Systems Command, Southwest	\$ 90,000	\$ 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
EOS Energy Storage, LLC.	\$ 2,880,000	\$ 0
TBD - Major Electrical Equipment	\$ 825,000	\$ 0
TBD - Misc. Electrical Equipment	\$500,000	\$ 0

K. Key Partners

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

Key Partner Legal Company Name		
No key partners to report		

L. Budget Information

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

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
GGRF	23-24	303.201	\$ 8,028,175

TOTAL Amount: \$8,028,175

R&D Program Area: ETSI

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: Carrie Pavlowsky

Address: 700 Braddock Ave

City, State, Zip: Turtle Creek, PA 15104

Phone: 417-714-0231

E-Mail: cpavlowsky@eose.com

2. Recipient's Project Manager

Name: Tim Kennedy Address: 700 Braddock Ave City, State, Zip: Turtle Creek, PA 15104



Phone: 973-714-5568

E-Mail: tkennedy@eos.com

N. Selection Process Used

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

Selection Process	Additional Information
Competitive Solicitation #	Not applicable
First Come First Served Solicitation #	Not applicable
Other	Non-competitive bid, program specific funding permissible under Public Resources Code section 25643(d) and previous competitively awarded grant EPC-18-023.

O. Attached Items

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

ltem 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: Caitlin Planchard

Approval Date: 11/5/2024

Branch Manager: Cody Taylor

Approval Date: 11/5/2024

Director: Cody Taylor for Jonah Steinbuck

Approval Date: Delegated to Branch Manager

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Develop Site and System Design Integrating LDES Technologies
3	Х	Procure Equipment and Materials for LDES System
4		Construct, Install, Integrate, Pre-Energize, and Test System Technologies
5	Х	Test and Commission LDES Systems
6		Operate LDES as Part of a Microgrid to Support Essential Loads
7	Х	Measurement and Verification
8		Evaluation of Project Benefits
9		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
Base	Naval Base San Diego
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CCI	California Climate Investments ²
CEC	California Energy Commission
Commissioning	Full charge and discharge at 3 MW for 16hrs for the combined LDES technologies during a PSPS, other outage events, or for load reduction at times of peak demand
CPR	Critical Project Review
CRADA	Cooperative Research and Development Agreement
ERCIP	Energy Resiliency Conservation Investment Program
GGRF	Greenhouse Gas Reduction Fund
GHG	Greenhouse Gas
LDES	Long Duration Energy Storage
MW	Megawatt
MWh	Megawatt-hour
Mechanical completion of LDES systems	Point at which (a) structural installation of the applicable project system(s) has occurred and (b) the project(s) is mechanically, electrically, and functionally complete to the extent necessary to be ready for initial commissioning, adjustment, and testing

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.

² An umbrella term and associated logo developed for the purpose of communication with funding recipients and the general public to identify programs or projects funded in whole or in part by the Greenhouse Gas Reduction Fund (GGRF). For information, visit: www.caclimateinvestments.ca.gov

Acronym/Term	Meaning
NAVFAC EXWC	Naval Facilities Engineering and Expeditionary Warfare Center
PSPS	Public Safety Power Shut-off
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

The purpose of this Agreement is to fund deployment of a 1 MW/8 MWh non-lithium-ion LDES system in support of Naval Base San Diego's Energy Resiliency Conservation Investment Program (ERCIP) project, P1301 Microgrid and Backup Power. The LDES system will be operated as part of the ERCIP microgrid, including 300 kW of solar photovoltaics, that serves a portion of Naval Base San Diego (Base) and its incorporated facilities. The project will demonstrate the EOS LDES battery system's ability to power critical Base operations with integrated renewables during outage events and periods of peak electricity demand in a coastal environment for up to 8 hours. The project aims to enhance the Base's energy resilience and serve as a test bed to develop a blueprint for the installation of LDES systems as part of renewable microgrid systems at naval facilities.

Funding for the Long Duration Energy Storage (LDES) program comes from the California Climate Investments (CCI) program. In accordance with the CCI program, this project shall facilitate the achievement of greenhouse gas (GHG) emission reductions and further the purposes of AB 32 (AB 32, Nunez, Global Warming Solutions Act of 2006, Chapter 488, 2006), SB 32 (SB 32, Pavley, California Global Warming Solutions Act of 2006, Chapter 249, 2016), and related statutes.

B. Problem/Solution Statement

Problem

For multiple reasons, California is facing challenges relating to high electricity rates and grid reliability. As the penetration of intermittent renewables increases in pursuit of California's net zero goals, and extreme weather events increase in severity and frequency, there will be a growing need for technology solutions to support grid reliability. LDES has the potential to significantly lower energy costs, reduce the strain on the grid, mitigate risks of system brown and blackouts, and provide resiliency to communities at risk of outages. The majority of storage systems deployed in California today are shorter duration lithium-ion batteries and LDES technologies have only been demonstrated at relatively small scales generally below 1 MW.

While smaller LDES systems exist, they have yet to be demonstrated at a scale that can provide regional benefits when coupled with renewables. Meanwhile, military bases require 14 days of backup power, which is typically provided through diesel generators. LDES has not yet been demonstrated as a use-case for supporting military base readiness or utilization in a renewable

microgrid for a prolonged period with co-located assets that provide resiliency for a regional circuit.

Solution

This project will deploy an 8 MWh zinc hybrid cathode battery as part of a behind-the-meter microgrid that can be deployed and configured rapidly with no impact on operations. The system will be "islandable" or able to operate independent of the grid during outages for more than 8 hours with equivalent or greater power quality than experienced at the facility during normal operations.

During summer months, when there is a higher risk of outages due to public safety power shutoff (PSPS) events, energy shortfalls or other factors, it is anticipated that there will be abundant solar energy to power the microgrid, and charge the LDES system, which will then be discharged later in the day during peak demand hours. The microgrid will also be able to provide load reduction during times of peak electricity demand, helping to support system reliability and achieve policy goals for 100 percent zero carbon renewable electricity.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Deploy an 8-hour, non-lithium-ion LDES technology at Naval Base San Diego to support the Base's ERCIP project microgrid and solar PV system and critical base facilities.
- Demonstrate how LDES as part of a microgrid can provide reliability and resilience benefits through islanding during outages and emergency events
- Deploy a 1 MW non-lithium-ion LDES system capable of providing power for 8 hours during PSPS events or other outages or times of peak electricity demand.
- Demonstrate 8MWh of LDES technology as part of a microgrid using on-site renewable generation to sustain critical operations.
- Demonstrate economic and social benefits resulting from decreased energy costs, increased reliability and resiliency, and educate Base personnel on the topic of LDES
- Uncover and validate LDES use cases in grid facing and behind-the-meter applications.
- Analyze low auxiliary load scenarios in a coastal low light environment.
- Enhance the Base's energy resilience
- Achieve LDES system readiness by January 1 2027 and full microgrid operation by January 1 2028.

LDES for Microgrids and Energy Readiness:

Military bases are required to maintain 14 days of on-hand operational power to ensure mission continuity and energy readiness at all times. These facilities are often at greater risk of adverse impacts resulting from unplanned grid outages, and PSPS events.

Energy security can be most effectively achieved by integrating on-site distributed renewables with diurnal LDES that can provide primary power to critical and essential loads regardless of grid conditions. Many examples of this have emerged in the solar and battery industry where solar is abundant and space is ample.

To date, there have been insufficient number and capacity of behind-the-meter LDES deployments, particularly in highly dense and developed areas. Even fewer have been successfully executed in developed coastal areas with suboptimal solar footprint and annual generation potential. Implementations of LDES combined with renewables in low light and non-ideal solar performing situations is unknown and is a key area of knowledge desired by all parties.

Agreement Objectives

The objectives of this Agreement are to:

- Demonstrate significant increased opportunities for the penetration of renewables in California using LDES.
- Demonstrate how non-lithium-ion LDES systems can be used in a microgrid as an alternative to lithium-ion systems, to enhance reliability and resiliency for facilities, particularly those with limited on-site space or sites in close proximity to buildings.
- Contribute to the reduction of greenhouse gas emissions and bolster energy independence and security, aligning well with federal and Department of Defense mandates.
- Enhance system resilience and offer greater flexibility in electrical operations, serving as a practical testing ground for standardized microgrid technologies.
- Provide a test bed for a replicable, scalable, expandable LDES and microgrid system blueprint that can achieve accreditation and be implemented at an installation-wide scale.

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.

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 MS 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:

- MS ASP.NET framework (version 3.5 and up). Recommend 4.0.
- MS 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.
- Structured Query Language (SQL).
- MS SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- MS 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. Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

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

The Recipient shall:

 Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other 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 <u>administrative portion</u> of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Invoicing and auditing procedures;
- Administrative products (subtask 1.1);
- Critical Project Review (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 <u>technical portion</u> 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 (TAC) 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

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(s)
- Progress Determination

Subtask 1.4 Final Meeting

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

The Recipient shall:

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

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

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM 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.

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
 - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the

Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.

- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions, including a financial report on Match Funds and in-state expenditures.
- Provide a *Six-Month Employee Labor Projection* that details the hour projections every six months covering the subsequent six months for each individual working on this Agreement. The Recipient shall submit a monthly review of the previous labor spent by each employee for the previous month in a *Monthly Time Tracking Report* for written approval by the CAM.
- In no event shall any individual providing direct labor under this Agreement, and combined with any other active or future Agreement with the CEC, invoice more than 1800 hours of direct labor per year without prior CAM written approval, regardless of the maximum number of hours permitted within any Budget.

Products:

- Progress Reports
- Invoices
- Six Month Employee Labor Projection
- Monthly Time Tracking Report

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

- 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/Summary table that includes the following information, but not limited to (required):
 - Recipient name;
 - Project description;
 - Project location(s);
 - Census tract;
 - Dates: project selected and completed;
 - GGRF dollars allocated;
 - Leveraged and/or match funds;
 - Estimated/actual total project GHG emission reductions;
 - Estimated/actual energy saved (kWh, therms, or other fuels) for energy efficiency projects;
 - Estimated/actual energy generated (kWh or therm equivalents) for renewable energy projects;
 - Other benefits or results;
 - Other market sectors that can benefit from the project;
 - Benefits to priority populations;
- 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.
 - o Comments the recipient does not propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:

- Summary of TAC Comments on Draft Final Report
- Draft Final Report

- Written Responses to Comments (if applicable)
- Final Report

CAM Product:

• Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND 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 <u>no match funds</u> 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 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 <u>no permits</u> are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
 - The schedule the Recipient will follow in applying for and obtaining the permits.

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

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

Products:

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

Subtask 1.9 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.

- 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.
- 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.

The Recipient shall:

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

Products:

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

Subtask 1.11 TAC Meetings

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

The Recipient shall:

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

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

Products:

- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

Products that require a draft version are indicated by marking "(draft and final)" after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.

TASK 2: DEVELOP SYSTEM DESIGN INTEGRATING LDES TECHNOLOGIES

The goal of this task is to complete the engineering design for installation and integration of the LDES technologies and system components including all electrical, civil, structural, architectural, and miscellaneous items required to develop a complete Issued for Construction set of design drawings.

The Recipient shall:

- Develop and submit *Issued for Construction Drawings* for review that include but are not limited to the following:
 - $\circ~$ Hardware design and specifications for the LDES technologies and system components
 - Anticipated construction and interconnection timelines
 - All necessary permits filed for building, interconnection, and back up generation
- Obtain necessary permits and approvals and provide a *Copy of Notice to Proceed* from the authorities having jurisdiction (AHJ)
- Conduct TAC Meeting #1 per subtask 1.10
 - Document, submit, and discuss these tasks and lessons learned during the TAC meeting with the TAC and the CAM
- Prepare a draft and final *Design Report* that includes but is not limited to the following.
 - Summary of all planned operational use cases for the LDES system over the course of the project
 - Schematics and integration details
 - Electrical design
 - Definition of schematic symbols and data entry types
 - Documentation of the capabilities of the battery management system(s)
 - System documentation
- Prepare a *Design Report Presentation (PowerPoint)* which will include the design plans and summarize and highlight the *Design Report* and present at a *Design Report* meeting.
- Work with Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) to develop and execute a *Cooperative Research and Development Agreement* (*CRADA*). This agreement will serve the following purposes:
 - Allow NAVFAC EXWC to participate in the research and assessment of LDES in naval facility applications under this project
 - Allow NAVFAC EXWC to uphold standard naval requirements and regulations regarding the installation of the LDES system on base

Products:

- Issued for Construction Drawings
- Design Report (Draft and Final)
- Copy of Notice to Proceed
- Design Report Presentation (PowerPoint)
- Executed CRADA with NAVFAC EXWC

TASK 3: PROCURE EQUIPMENT AND MATERIALS FOR LDES SYSTEM

The goal of this task is to procure, track and manage logistics for delivery of the 8MWh combined LDES technologies to the demonstration site.

The Recipient shall:

- Develop a detailed Master List of Equipment and Materials for the technologies
- Receive written approval of *Master List of Equipment and Materials* from CAM before placing purchase order for technologies
- Issue purchase orders based on approved Master List of Equipment and Materials
- Coordinate delivery of technologies to the project demonstration site
- Confirm and document receipt of the technologies to facility
- Develop and submit Supplier-Specific Payment Schedules for written approval by
- CAM reflecting a milestone process for purchasing technologies and associated equipment. This will include an explicit schedule for reimbursement of specific retention costs.
- Assume ownership of all systems, equipment, and materials ("Project") upon verification of successful systems commissioning and project operation.
- Prepare a *CPR Report #1* and participate in CPR Meeting, per subtask 1.3. Report shall also include:
 - Equipment and materials purchase orders

Products:

- Master List of Equipment and Materials
- Supplier-Specific Payment Schedules
- CPR Report #1

TASK 4: CONSTRUCT, INSTALL, INTEGRATE, PRE-ENERGIZE, AND TEST SYSTEM TECHNOLOGIES

The goal of this task is to construct the system, develop the site, install the LDES and fully integrate the LDES with the project microgrid controller. Testing will be completed up to the point of commissioning.

- Install all equipment at the demonstration site, including but not limited to the LDES technologies, balance of systems, and controls
- Develop site and complete civil and structural work.
- Install all site security installation and install electrical equipment.
- Make appropriate electrical connections to utility distribution system
- Receive final approval for interconnection from the utility providing service
- Prepare a draft and final *Equipment Testing and Readiness Report* that includes but is not limited to the following:
 - Specific pre-energization testing and evaluation performed on all components to confirm proper functionality
 - Testing data sheets that verify all equipment was evaluated and tested according to established procedures to ensure all equipment and individual system components are safe to energize and will function as designed
- Participate in final inspection and obtain Final Installation Inspection Letter from the AHJ

or its representative, confirming Mechanical Completion of LDES Systems and System Readiness

Products:

- Equipment Testing and Readiness Report
- Final Installation Inspection Letter

TASK 5: TEST AND COMMISSION LDES SYSTEM

The goals of this task are to test each major component and system individually and then as part of the microgrid system, to complete commissioning, and to receive permission to operate.

The Recipient shall:

- Coordinate with San Diego Gas and Electric (SDG&E) and CAISO, as needed, for interconnection.
- Execute a LDES acceptance testing and commissioning plan and create a *Performance Test Results Report* including the following:
 - Results of subsystem and system verification tests
 - Acceptance Test Results for each subsystem as indicated
 - Test results of full system performance verification
 - Test results microgrid controls integration
- Provide a Systems Readiness Certification
- Achieve *Authority to Operate* by the AHJ or its representative and provide a copy of approval documentation.
- Conduct TAC Meeting #2 per subtask 1.10
 - Document, submit, and discuss this task's lessons learned with the CAM during the TAC meeting.
- Prepare a CPR Report #2 and participate in CPR Meeting, per subtask 1.3.

Products:

- Testing and Commissioning Plan
- Performance Test Results Report
- Systems Readiness Certification
- Authority to Operate Letter
- CPR Report #2

TASK 6: OPERATE LDES AS PART OF A MICROGRID TO SUPPORT ESSENTIAL LOADS

This task will demonstrate how the LDES/microgrid system will support essential loads during outages and times of peak electricity demand while optimizing the use of renewable energy.

- Develop a draft and final *Microgrid Sequence of Operation Plan*
 - Define conditions under which systems should island
 - Program sequence of microgrid systems isolation and restart
 - Set conditional prioritization schema for solar, batteries, and loads
 - Define limitations on minimum and maximum duration of support
 - Incorporate grid resynchronization procedures

- Test the LDES and microgrid ability to support 100 percent renewable energy-based operation with on-site generation when islanded during grid outages and emergency events
- Prepare a Microgrid Sequence of Operations Report
- Prepare a Microgrid System Performance Report
- Conduct TAC Meeting #3 per subtask 1.10
 - Document, submit, and discuss this task's lessons learned during the TAC meeting with the TAC and the CAM.

Products:

- Microgrid Sequence of Operations Plan
- Microgrid Sequence of Operations Report
- Microgrid System Performance Report

TASK 7: MEASUREMENT AND VERIFICATION

The team will measure and verify the performance of the microgrid and LDES technologies and compare to projected performance. The goal of this task is to report the benefits resulting from this project by performing measurement and verification (M&V) of GHG and energy consumption reduction.

- Enter into an agreement with M&V subcontractor per Task 1.9 (if using an outside vendor)
- Coordinate site visits with the M&V subcontractor at the demonstration site(s)
- Develop a *M&V protocol* for *pre-installation* measurement (and calculation) of electric, natural gas and/or other fossil fuel consumption, and GHG emissions of the equipment/process/system(s)/sub-system(s) that are to be upgraded and/or replaced and/or modified.
 - Ensure installation of sub-metering equipment and data loggers for pre/post data analysis.
 - The ERCIP microgrid, without the incorporation of the LDES system, will be considered the pre-installation system.
- Prepare and provide a detailed *M&V Plan* for each project demonstration site to include but not be limited to:
 - A description of the monitoring equipment and instrumentation which will be used.
 - A description of the key input parameters and output metrics that will be measured.
 - A description of the M&V protocol, analysis, and collection methods to be employed.
 - A data collection schedule
 - A description of the independent, third-party M&V services to be employed, if applicable.
- Perform three months (or a shorter period as approved in writing by the CAM) of preinstallation measurements (and calculations) based on the M&V protocol for preinstallation.

- Prepare and provide a *Pre-Installation M&V Findings Report* for each demonstration site that includes M&V protocol, pre-install measurements (and calculations), analysis, and results performed in this task.
- Develop M&V protocol for *post-installation* measurements (and calculations) of:
 - Electric, natural gas and/or other fossil fuel consumption, and GHG emissions of the equipment/process/system(s)/sub-system(s) that will be upgraded and/or replaced and/or modified. Factors and metrics to be approved by the CAM.
- Perform at least three years (or a shorter period as approved in writing by the CAM) of post-installation measurements based on M&V protocol for post-installation.
- Provide a summary of post-installation M&V progress in Progress Report(s) (see subtask 1.5) which shall include but not be limited to:
 - A narrative on operational highlights from the reporting period, including any stoppages in operation and why; and
 - A summary of M&V findings from the reporting period.
- Analyze post-installation electrical, natural gas and/or other fossil fuel consumption, and GHG emissions.
- Prepare and provide a Post-Installation M&V Findings Report for each demonstration site that includes M&V protocol, pre- and post-install measurements (and calculations), analysis, and results performed in this task. Results should at a minimum report on the reduction of electricity, natural gas and/or other fossil fuel usage and reductions of GHG emissions that directly result from this project. The Post-Installation M&V Findings Report should also report insights on the following topics:
 - Establish economic models for asymmetric charge/discharge use cases and provide value models thereto.
 - Analyze the long-term performance of zinc hybrid cathode battery systems.
 - Validate long term ownership value-add of zinc hybrid technology in operations due to ease of maintenance (solid state).
- Provide all key assumptions used to estimate and determine energy and GHG reductions (and additions, if applicable).
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations.
- Report GGRF benefits per the frequency and metrics listed in the terms and conditions and as provided by CARB guidance.
- Prepare a *CPR Report #3* in accordance with subtask 1.3. and participate in a CPR Meeting.

Products:

- M&V Plan (Draft and Final)
- Pre-Installation M&V Findings Report (*draft and final*)
- Post-Installation M&V Findings Report(s) (*draft and final*)
- GGRF Benefits Report
- CPR Report #3

TASK 8: EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete *the Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by January 31st of each year. The Annual Survey includes but is not limited to the following information:
 - Technology commercialization progress
 - New media and publications
 - Company growth
 - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the <u>Energize Innovation website</u> (<u>www.energizeinnovation.fund</u>), 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 <u>Energize Innovation website</u> (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 9: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITES

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.

- 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.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the draft *Project Case Study Plan*. This document will identify:
 - TAC comments the recipient proposes to incorporate into the final *Technology Transfer Plan*.
 - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the final *Project Case Study* to the CAM for final approval
- Submit the *Safety Guidelines Report* to that outlines the hazard and mitigation insights and applications of the project.
- 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 knowledge sharing event(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
- Safety Guidelines Report
- Project Case Study
- Summary of TAC Comments
- Technology Transfer Summary Report
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.