California Energy Commission
January 21, 2026 Business Meeting
Backup Materials for Lawrence Berkeley National Laboratory

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

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

[PROPOSED]

RESOLUTION NO: 26-0121-XX

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: Lawrence Berkeley National Laboratory

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-25-039 with Lawrence Berkeley National Laboratory for a $3,000,000 grant. This agreement will fund the design, prototyping, field validation, and initial classification of a next-generation smart mooring system for floating offshore wind infrastructure. The system integrates distributed fiber optic sensing to enable real-time entanglement detection, structural health monitoring, and environmental acoustic monitoring along mooring lines; 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 January 21, 2026.

AYE:
NAY:
ABSENT:
ABSTAIN:

Dated:

_____
Kim Todd
Secretariat

STATE OF CALIFORNIA
CALIFORNIA ENERGY COMMISSION

CEC-270 (Revised 01/2024)

GRANT REQUEST FORM (GRF)

A. New Agreement Number

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

New Agreement Number: EPC-25-039

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Matthew Haro
3. MS-51
4. Phone Number: 916-903-4158

C. Recipient's Information

1. Recipient's Legal Name: Lawrence Berkeley National Laboratory

D. Title of Project

Title of project: Distributed Real-time Entanglement, Acoustic, and Mooring Structural Health Monitoring System (DREAMS)

E. Term and Amount

1. Start Date: 3/1/2026
2. End Date: 10/31/2029
3. Amount: $3,000,000.00

F. Business Meeting Information

1. Are the ARFVTP agreements $75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 1/21/2026 .
3. Consent or Discussion? Consent
4. Business Meeting Presenter Name: Matthew Haro
5. Time Needed for Business Meeting: 0 minutes.
6. The email subscription topic is: Enter the email subscription topic name.

Agenda Item Subject and Description:

Lawrence Berkeley National Laboratory. Proposed resolution approving agreement EPC-25-039 with Lawrence Berkeley National Laboratory for a $3,000,000 grant and adopting staff's recommendation that this action is exempt from CEQA. This agreement will fund the design, prototyping, field validation, and initial classification of a next-generation smart mooring system for floating offshore wind infrastructure. The system integrates distributed fiber optic sensing to enable real-time entanglement detection, structural health monitoring, and environmental acoustic monitoring along mooring lines. (EPIC funding) Contact: Matthew Haro

G. California Environmental Quality Act (CEQA) Compliance

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

Yes

If yes, skip to question 2.

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

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

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

a) Agreement **IS** exempt?

Yes

Statutory Exemption?

Yes

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: 21080(b)(14)
CCR section number: 14 CCR 15277

CEQA does not apply to any project or portion thereof located outside of California which will be subject to an environmental impact review pursuant to NEPA or pursuant to a law of that state requiring the preparation of a document containing essentially the same points of analysis as in an environmental impact statement prepared under NEPA. (Pub. Resources Code sec. 21080(b)(14); Cal. Code Regs., tit. 14, sec. 15277.) Here, the onsite demonstration aspect of this project involving the installation of the mooring system will occur in the Gulf of Maine and is subject to Maine's Natural Resources Protection Act (NRPA). Therefore, the demonstration aspect of this project is exempt from CEQA pursuant.

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, 15306

Cal. Code Regs., tit. 14, sec. 15301 provides that projects which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of use beyond that existing at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act. This project will involve environmental and structural health monitoring technologies research related to offshore wind mooring systems conducted at an existing testing facility in Berkeley. The project will result in no expansion of any existing or former uses of the facility. Therefore, the project falls within section 15301 and is exempt from CEQA.

Cal. Code Regs., tit. 14, sec. 15306 provides that projects that consist of basic data collection, research, experimental management, and resource evaluation activities that do not result in serious or major disturbances to an environmental resource are exempt from CEQA. This project consists of environmental and structural health monitoring research related to offshore wind mooring systems and will consist of research design, experimentation and testing, and data collection in an existing

laboratory environment that will have no impact on the environment. Therefore, the project falls within section 15306 and is exempt from CEQA.

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 apply to this project, and this project will not have a significant effect on the environment.

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

Yes

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

A project is exempt from CEQA if it is covered by the common sense exemption to CEQA where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment. (14 Cal. Code. Regs., tit. 14, sec. 15061(b)(3).) Here, the laboratory testing occurring at Lawrence Berkeley National Laboratory will be occurring in a long wave tank that is currently in existence, that will be used with no modifications necessary to conduct the testing required by this project, and where it is currently being used for similar projects. As such, it is infeasible that the laboratory testing could have a significant effect on the environment as a matter of common sense and thus the project is exempt from CEQA.

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
The Regents of the University of California, on behalf of the Berkeley campus	$ 685,800	$ 171,450
University of Maine System acting through the University of Maine	$ 976,802	$ 407,816
American Bureau of Shipping	$ 120,040	$ 31,257

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
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
EPIC	23-24	301.001K	$ 2,294,237
EPIC	24-25	301.001L	$ 705,763

TOTAL Amount: $ 3,000,000

R&D Program Area: ESB: Renewables

Explanation for “Other” selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: 101

M. Recipient’s Contact Information

1. Recipient’s Administrator/Officer

Name: Yuxin Wu

Address: 1 Cyclotron Rd, MS 74R316C

City, State, Zip: Berkeley, CA 94720

Phone: 510-486 -4793

E-Mail: YWu3@lbl.gov

2. Recipient’s Project Manager

Name: Yuxin Wu

Address: 1 Cyclotron Rd, MS 74R316C

City, State, Zip: Berkeley, CA 94720

Phone: 510-486-4793

E-Mail: Ywu3@lbl.gov

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-24-307
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	Yes

Approved By

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

Agreement Manager: Matthew Haro

Approval Date: 12/11/2025

Branch Manager: Kevin Uy

Approval Date: 12/12/2025

Director: Kevin Uy for Jonah Steinbuck

Approval Date: 12/12/2025

Exhibit A
Scope of Work
Lawrence Berkeley National Laboratory

I. TASK AND ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		System Design and Prototype Fabrication
3	X	Lab Scale Testing
4		AI/ML Algorithm Development
5		Field Demonstration
6	X	Data Analysis and Validation
7		NTQ and AIP Submission
8		Evaluation of Project Benefits
9		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
ABS	American Bureau of Shipping
AI/ML	Artificial Intelligence/Machine Learning
AIP	Approval In Principle
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
DAS	Distributed Acoustic Sensing
DFOS	Distributed Fiber Optic Sensing
DSS	Distributed Strain Sensing
DTS	Distributed Temperature Sensing
FOWT	Floating Offshore Wind Turbine
NTQ	New Technology Qualification
SNR	Signal-to-Noise Ratio
TAC	Technical Advisory Committee
TRL	Technology Readiness Level

[1] Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

Exhibit A
Scope of Work
Lawrence Berkeley National Laboratory

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the design, prototyping, field validation, and initial classification of a next-generation smart mooring system. The system integrates distributed fiber optic sensing to enable real-time entanglement detection, structural health monitoring, and environmental acoustic monitoring along mooring lines.

B. Problem/ Solution Statement

Problem

The development of floating offshore wind turbines (FOWTs) for California's deep waters creates new environmental and operational risks, particularly the threat of marine debris entanglement with mooring lines and the challenge of maintaining mooring system integrity over time. Current monitoring technologies rely on discrete sensors or visual inspections, which provide only limited coverage, require costly maintenance, and offer little capability for real-time detection of entanglements or structural anomalies.

There is currently no commercially available solution that enables continuous, real-time monitoring of mooring lines for entanglement, structural strain, and environmental acoustic conditions. Without such capabilities, floating offshore projects face increased risks to marine wildlife, regulatory hurdles, operational downtime, and higher lifecycle costs. Solving this monitoring gap is urgent to ensure both environmental stewardship and project reliability.

Solution

This project will develop, prototype, and field-validate a smart mooring system that embeds distributed fiber optic sensing (DFOS) directly into synthetic mooring lines. By combining distributed strain sensing (DSS), distributed acoustic sensing (DAS), and distributed temperature sensing (DTS) into a single embedded system, the mooring lines themselves become intelligent, maintenance-free sensors capable of detecting entanglement events, structural degradation, and marine acoustic activity in real time.

The system addresses key technology gaps by enabling continuous, kilometer-scale monitoring without the need for external power, discrete sensors, or costly subsea electronics. It provides early warnings of derelict gear entanglement and mooring line fatigue, while also supporting marine mammal monitoring and regulatory compliance through passive acoustic sensing. Integrated artificial intelligence/machine learning (AI/ML) analytics will automate anomaly detection and event classification, further enhancing operational efficiency and response capabilities.

By providing immediate detection of entanglements and structural issues, the system reduces the likelihood of catastrophic failures, minimizes operational downtime, and improves the safety and affordability of floating offshore operations. It also streamlines environmental permitting and monitoring by supplying real-time, high-fidelity data on marine mammal activity and underwater noise impacts.

This innovation directly supports California's statutory clean energy goals by enabling more reliable, cost-effective, and environmentally responsible offshore energy development. It helps address barriers identified under AB 525 by reducing risk, accelerating permitting timelines, and supporting the large-scale deployment of offshore infrastructure in California wind energy areas (WEAs).

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Design and fabricate a smart synthetic mooring rope embedded with a DFOS system capable of continuous monitoring of a FOWT mooring line.
- Accurately detect and determine the location of localized entanglement loads from derelict fishing gear (e.g., standard crab pots or ghost nets).
- Develop and validate AI/ML algorithms capable of detecting entanglement and structural anomalies based on multi-modal DFOS signals with a high degree of accuracy and a very low false positive detection rate.
- Demonstrate the system's ability to detect low-frequency whale vocalizations.
- Achieve TRL 7 through successful open-water demonstration on the VolturnUS+ 1/4-scale floating platform by project completion.
- Submit a complete new technology qualification (NTQ) package and receive approval in principal (AIP) certification from American Bureau of Shipping (ABS) by project completion.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity abundance, reliability, lower costs, and increased safety by enabling early detection of mooring entanglements, structural fatigue, and environmental risks that could otherwise lead to offshore platform failures or operational downtime. Real-time monitoring will allow operators to prevent catastrophic events, reduce unscheduled maintenance, and minimize energy delivery interruptions to the grid.

By reducing reliance on costly, high-risk subsea inspections and enabling an environmental compliance solution for permitting, the smart mooring system is projected to save an estimated $5–11 million annually for a typical 1 Gigawatt (GW) floating wind farm. These savings will ultimately help lower the levelized cost of energy from FOWT projects, benefiting California electricity ratepayers through more affordable, reliable, and sustainable energy supply.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs by delivering the world's first integrated smart mooring system with embedded DFOS for real-time entanglement detection, structural health monitoring, and

[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).

[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.

environmental acoustic sensing. The project overcomes key technical barriers to the deployment of FOWT in California's deep-water WEAs, where traditional discrete sensor approaches are impractical, costly, and insufficient.

By enabling continuous, maintenance-free monitoring along kilometer-scale mooring lines, the project directly supports California's statutory clean energy goals under SB 100 and AB 525 by reducing offshore infrastructure risks, minimizing environmental impacts, and lowering operational costs. These innovations will accelerate the permitting, construction, and reliable operation of the 4–5 GW of offshore energy generation targeted by 2030 and beyond.

Agreement Objectives

The objectives of this Agreement are to:

- Design and fabricate a smart synthetic mooring rope embedding a DFOS system capable of monitoring over at least 1 kilometer of mooring line.
- Achieve a strain sensing resolution of ≤10 microstrain (με) and spatial localization accuracy of ≤1.5 meters for detecting entanglement events or structural anomalies.
- Develop AI/ML algorithms capable of achieving ≥90% entanglement detection sensitivity and ≤5% false positive rate across multi-modal DFOS data streams.
- Demonstrate detection of standard crab pot (~15–25 kg) and ghost net (~50 kg) entanglements during controlled wave tank tests and open-water field tests.
- Successfully record low-frequency marine mammal vocalizations (10–500 Hz) with a signal-to-noise ratio (SNR) greater than 15 dB using DAS.
- Complete open-water field testing on the VolturnUS+ 1/4-scale platform, verifying reliable system performance under realistic offshore operating conditions.
- Submit a NTQ package and request AIP from ABS for the smart mooring system design by project completion.

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 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.

  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 1.7) *(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 may 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 may 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. A

determination of unsatisfactory progress This may result in project delays, including a potential Stop Work Order, while the CEC determines whether the project should continue.
- 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 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 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.

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 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 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 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 <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 1.10 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)*

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.

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.
- 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

IV. TECHNICAL TASKS

TASK 2 SYSTEM DESIGN AND PROTOTYPE FABRICATION

The goal of this task is to design, develop, and fabricate a DFOS-embedded smart mooring prototype capable of real-time monitoring of entanglement events, structural health anomalies, and marine acoustic activity.

The Recipient shall:

- Develop a detailed *Smart Mooring System Design Plan* that specifies rope material selection, DFOS cable architecture, mechanical load performance criteria, and environmental durability standards.
- Design and fabricate prototype embedded DFOS cables compatible with synthetic mooring rope structures, capable of maintaining sensing integrity when embedded in ≥1 kilometer rope.
- Collaborate with a rope manufacturer to design and fabricate smart mooring rope prototypes with embedded DFOS cable(s), ensuring mechanical performance equivalent to standard deepwater mooring specifications.
- Prepare a *Smart Mooring System Design Report (draft and final)* summarizing the final design, fabrication process, preliminary validation results, and readiness for lab-scale testing.

Products:

- Smart Mooring System Design Plan
- Smart Mooring System Design Report (draft and final)

TASK 3 LAB-SCALE TESTING

The goal of this task is to validate the performance of the smart mooring prototype under controlled laboratory conditions that simulate entanglement events, dynamic loading, and marine acoustic environments.

The Recipient shall:

- Develop a *Lab-Scale Testing Plan (draft and final)* that describes testing objectives, experimental setups, entanglement simulation procedures, acoustic playback scenarios, instrumentation configurations, and evaluation criteria.
- Conduct entanglement simulation tests in the UC Berkeley 180-foot wave tank by applying representative fishing gear (e.g., crab pots, ghost nets) to the smart mooring prototypes and measuring distributed strain responses.
- Conduct dynamic load testing by subjecting the mooring prototypes to cyclic tension loads to assess strain sensing performance and structural health monitoring capabilities.
- Conduct acoustic sensitivity testing by playing low-frequency whale calls and impulsive gear collision signals and recording DAS responses along the prototype.
- Prepare a *Lab-Scale Testing Results Report (draft and final)* that summarizes test setups, methods, results, detection performance metrics, lessons learned, and recommendations for prototype refinements.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings)

Products:

- Lab-Scale Testing Plan (draft and final)
- Lab-Scale Testing Results Report (draft and final)
- CPR Report #1

TASK 4 AI/ML ALGORITHM DEVELOPMENT

The goal of this task is to develop, train, and validate AI/ML algorithms for real-time detection of entanglement events, structural health anomalies, and marine mammal acoustic signals based on multi-modal DFOS data streams.

The Recipient shall:

- Develop a *Machine Learning Development Plan (draft and final)* that outlines training datasets, feature extraction methods, model architecture, training and validation strategies, and performance metrics.
- Train and optimize anomaly detection models using strain and temperature data to identify abnormal loading patterns associated with entanglements or structural degradation.
- Train and optimize acoustic classification models to distinguish whale vocalizations, vessel traffic noise, and gear collision events using DFOS data.
- Conduct data fusion analysis to integrate strain, acoustic, and temperature features for improved event localization and classification accuracy.
- Validate models against lab-scale test datasets to achieve ≥90% detection sensitivity and ≤5% false positive rate.

- Refine models iteratively based on lab results and prepare for deployment in field demonstration testing.
- Prepare an *AI/ML Model Development and Validation Report (draft and final)* summarizing methodologies, training datasets, model performance results, and lessons learned.

Products:
- Machine Learning Development Plan (draft and final)
- AI/ML Model Development and Validation Report (draft and final)

TASK 5 FIELD DEMONSTRATION
The goal of this task is to deploy the smart mooring prototype on an open water floating platform and validate its real-time sensing performance under real marine conditions. Validation shall include entanglement simulation, dynamic loading, and ambient acoustic monitoring.

The Recipient shall:
- Develop a *Field Deployment and Testing Plan (draft and final)* that details deployment logistics, integration procedures with the VolturnUS+ platform, experimental test scenarios, monitoring protocols, and safety considerations.
- Collaborate with a rope manufacture to fabricate and prepare full-scale smart mooring rope sections based on the lab-validated design. The rope shall incorporate connectors, anchors, and terminations suitable for offshore deployment.
- Install the smart mooring prototype onto the VolturnUS+ 1/4-scale platform at the University of Maine's open-water test site, ensuring optical and structural integration.
- Conduct simulated entanglement tests by applying representative derelict fishing gear (e.g., crab pots, ghost nets) to the mooring line in the marine environment and recording DFOS responses.
- Conduct operational load monitoring during natural ocean conditions (waves, currents, temperature gradients, and biofouling) to assess dynamic strain and motion-induced loading.
- Conduct acoustic environmental monitoring by recording ambient marine noise and marine mammal vocalizations (natural or playback) using DAS.
- Prepare a *Field Demonstration Results Report (draft and final)* summarizing deployment procedures, field test data, detection outcomes, system performance relative to targets, and lessons learned.

Products:
- Field Deployment and Testing Plan (draft and final)
- Field Demonstration Results Report (draft and final)

TASK 6 DATA ANALYSIS AND VALIDATION
The goal of this task is to analyze and validate data collected from lab-scale and field testing to quantify the smart mooring system's detection accuracy, sensing performance, and readiness for technology qualification submission.

The Recipient shall:
- Develop a *Data Analysis and Validation Plan (draft and final)* that outlines data

processing workflows, event detection criteria, comparison methodologies between ground-truth and DFOS measurements, and validation thresholds.
- Perform correlation analysis between known entanglement, dynamic loading, and acoustic event scenarios, and corresponding DFOS signal responses for both lab-scale and field tests.
- Evaluate strain detection performance by calculating detection sensitivity, localization accuracy, and false positive rates for simulated entanglement events.
- Evaluate acoustic monitoring performance by assessing SNR for marine mammal vocalizations and classification accuracy for different acoustic event types.
- Validate AI/ML model outputs against ground-truth labels and quantify performance improvements based on field data.
- Refine event detection algorithms based on discrepancies between predicted and observed outcomes.
- Prepare a *Data Analysis and Validation Report (draft and final)* summarizing methods, key findings, performance metrics achieved relative to project targets, and readiness assessment for NTQ submission.
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings)

Products:
- Data Analysis and Validation Plan (draft and final)
- Data Analysis and Validation Report (draft and final)
- CPR Report #2

TASK 7 NTQ AND AIP SUBMISSION
The goal of this task is to engage with ABS to prepare a NTQ package and submit documentation to obtain an AIP for the smart mooring system.

The Recipient shall:
- Develop an *NTQ and AIP Documentation Plan (draft and final)* that outlines required technical documents, safety assessments, risk analyses, and an ABS engagement schedule.
- Share with ABS the smart mooring system design, test plan and test results from previous tasks, including design drawings, materials specifications, sensing system descriptions, and laboratory and field validation data.
- Invite ABS to join the test plan review, testing witness and other activities required for NTQ and AIP processes.
- If needed, participate in ABS Interim Review Meetings to obtain feedback during the NTQ documentation preparation process.
- Finalize and submit a *NTQ Application Package* to ABS, addressing all identified review requirements.
- Finalize and submit an *AIP Application Package* to ABS based on NTQ findings and design compliance.
- Respond to ABS review comments and provide additional supporting documentation as requested.
- Prepare an NTQ *and AIP Submission Report (final only)* that summarizes the submission process, reviewer feedback, and outcomes.

Products:

- NTQ and AIP Documentation Plan (draft and final)
- NTQ Application Package
- AIP Application Package
- NTQ and AIP Submission Report

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 Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), 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 ACTIVITIES

The goal of this task is to conduct activities that will accelerate the commercial adoption of the technology being supported under this agreement. Eligible activities include, but are not limited to, the following:

- Scale-up analysis including manufacturing analysis, independent design verification, and process improvement efforts.
- Technology verification testing, or application to a test bed program located in California.
- Legal services or licensing to secure necessary intellectual property to further develop the technology
- Market research, business plan development, and cost-performance modeling.
- Entry into an incubator or accelerator program located in California.

The Recipient Shall:

- Develop and submit a *Technology Transfer Plan* that identifies the proposed activities the recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the draft *Technology Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the Draft Technology Transfer 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 *Technology Transfer Plan* to the CAM for approval.
- Implement activities identified in final *Technology Transfer Plan*.
- Develop and submit a *Technology Transfer Summary Report* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the Final Technology Transfer Plan. This report should not include any proprietary information.
- 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 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:

- Technology Transfer Plan (draft and final)
- Summary of TAC Comments
- Technology Transfer Summary Report (draft and final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.