



GRANT REQUEST FORM (GRF)

A) New Agreement # PIR-20-003 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Peter Chen	43	916-327-1312

C) Recipient's Legal Name	Federal ID Number
Golden Gate Zero Emission Marine, Inc.	82-4324675

D) Title of Project
Small Fast Multi-Use Hydrogen Fuel Cell Harbor Craft

E) Term and Amount

Start Date	End Date	Amount
4/1/2021	3/31/2025	\$ 2,000,000

F) Business Meeting Information

ARFVTP agreements \$75K and under delegated to Executive Director

Proposed Business Meeting Date 3/17/2021 Consent Discussion

Business Meeting Presenter Peter Chen Time Needed: 5 minutes

Please select one list serve. Research (Energy RDD / PIER program)

Agenda Item Subject and Description:

GOLDEN GATE ZERO EMISSION MARINE, INC.

Proposed resolution approving Agreement PIR-20-003 with Golden Gate Zero Emission Marine, Inc. for a \$2,000,000 grant to develop a marine hydrogen fuel cell powertrain to power a passenger/patrol vessel, and adopt staff's determination that this action is exempt from CEQA. The project will develop a portable refueling system to enable the vessel to be fueled with hydrogen sourced from existing retail stations, avoiding the need for siting shoreside infrastructure. The researchers will demonstrate the completed zero-emission vessel at the Port of San Francisco and Port of Long Beach to validate performance. (PIER NG funding) Contact: Peter Chen. (Staff presentation: 5 minutes).

G) California Environmental Quality Act (CEQA) Compliance

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

Yes (skip to question 2)

No (complete the following (PRC 21065 and 14 CCR 15378)):

Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:

a) Agreement **IS** exempt.

Statutory Exemption. List PRC and/or CCR section number:

Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14, § 15306

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



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Explain reason why Agreement is exempt under the above section: This project is exempt under Cal. Code Regs., tit. 14, Section 15306, because it focuses primarily on information collection efforts related to the design and development of hydrogen fuel cell powertrains for marine applications. The project involves hydrogen fuel cell stack optimization, vessel integration, and development of a portable fueling method that will be done within existing laboratory environments.

The project includes demonstration activities at the Port of San Francisco and Port of Long Beach. The hydrogen fuel cell-powered vessel and portable refueler will meet U.S. Department of Transportation and Coast Guard safety standards to mitigate risks. Project activities will not result in a serious or major disturbance to an environmental resource.

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

Check all that apply

- Initial Study
- Negative Declaration
- Mitigated Negative Declaration
- Environmental Impact Report
- Statement of Overriding Considerations

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

Legal Company Name:	Budget
The Regents of the University of California, Irvine Campus	\$ 99,000
Ocean5 Inc. dba Ocean5 Naval Architects	\$ 0
TBD - Technology/Knowledge Transfer	\$ 0
TBD - Tank Frame Fabricator	\$ 0
TBD - Pipe Welding and Inspection	\$ 0
TBD - Painter	\$ 0
TBD - Enclosure Fabricator	\$ 0
	\$

I) List all key partners: (attach additional sheets as necessary)

Legal Company Name:
Southern California Gas Company



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J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
NG Subaccount, PIERDD	19-20	501.001N	\$2,000,000
			\$
			\$

R&D Program Area: EGRO: Transportation

TOTAL: \$ 2,000,000

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Ricky Elder
Address: 909 Marina Village Pkwy
145

City, State, Zip: Alameda, CA
94501-1048

Phone: 650-279-3171

E-Mail: relder@ggzeromarine.com

2. Recipient's Project Manager

Name: Joseph Pratt
Address: 909 Marina Village Pkwy
145

City, State, Zip: Alameda, CA
94501-1048

Phone: 510-788-5101

E-Mail: jpratt@ggzeromarine.com

L) Selection Process Used

Competitive Solicitation Solicitation #: GFO-20-604

First Come First Served Solicitation Solicitation #:

M) The following items should be attached to this GRF

- 1. Exhibit A, Scope of Work Attached
- 2. Exhibit B, Budget Detail Attached
- 3. CEC 105, Questionnaire for Identifying Conflicts Attached
- 4. Recipient Resolution N/A Attached
- 5. CEQA Documentation N/A Attached

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

Exhibit A Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Design and Engineering
3		Hydrogen Safety Plan and Design Review
4		Build and Assembly
5	X	Commissioning and Testing
6		Vessel Integration and Trials
7		Vessel Demonstration
8		Evaluation of Project Benefits
9		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
GHG	Greenhouse Gas
H2FC	Hydrogen Fuel Cell
HSP	Hydrogen Safety Panel
HV	High Voltage
LV	Low Voltage
P&ID	Piping and Instrumentation Diagram
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 develop and demonstrate a small fast hydrogen fuel cell (H2FC) harbor craft to reduce emissions and advance the use of hydrogen in the marine sector. This includes modifying an existing vessel, developing a marine-ready H2FC and storage system, and developing a mobile refueling method.

B. Problem/ Solution Statement

Problem

California is home to more than one million vessels that contribute to carbon and diesel particulate matter emissions. These emissions are toxic air contaminants which can increase cancer risk of

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

communities surrounding the areas of use. Today, numerous entities around the globe, from small startups to multinational corporations, are developing fuel cell-powered vessels for nearly all types of marine vessels (ferries, tugs, pushboats, water taxis, cruise ships, research vessels, etc.). Over 98 percent of the one million vessels in California are under 40 feet long, and these vessels require different powertrains than the aforementioned fuel cell-powered vessels in development.

The light-duty vehicle market has proven the capability of hydrogen to meet or exceed the performance of current combustion engine-powered vehicles, but the costs of hydrogen production, distribution, and infrastructure are struggling to compete with that of diesel and gasoline. Fuel cell applications are limited by these cost factors rather than technical issues related to performance, reliability, or safety. Without proper avenues for increasing hydrogen demand, hydrogen will never be able to reach economies of scale and California will struggle to adopt fuel cell as an economically viable zero-emission power solution.

Solution

The Recipient will develop and demonstrate a small fast H2FC-powered harbor craft that aims to capture the market of over 98 percent of California's vessels. The vessel will be outfitted with a powertrain that can be utilized in multiple vessel use types including patrol, fire and rescue, commercial fishing, pilot, excursion, taxi, and recreation. The Recipient will develop a mobile fueling system and procedure that has use cases for power systems on both land and water. The development of this marine H2FC power system and refueling system will make way for an expansion of fuel cell usage across California. With low-cost fuel cells in use across multiple industries, hydrogen production demand can scale up and reduce hydrogen costs. Widespread adoption of H2FC powertrains will drastically reduce the amount of toxic air contaminants and greenhouse gas (GHG) emissions by displacing combustion engines.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Design, engineer, and demonstrate a small fast H2FC vessel;
- Design and build a fueling system that can be applied to hydrogen powertrains across multiple industries;
- Improve the accessibility to hydrogen fueling infrastructure for H2FC vessels; and
- Validate the safety, reliability, and operational efficiency of H2FC harbor craft by collecting real world demonstration data.

Ratepayer Benefits: This Agreement will result in the ratepayer benefits of lower costs, increased safety, and improved renewable hydrogen production by development of a zero-emission powertrain that can be fit onto hundreds of harbor craft and hundreds of thousands of other small vessels. The elimination of diesel and gasoline consumption from small marine vessels will eliminate the emissions of associated air pollutants and GHGs resulting in improved health and safety for vessel owners, operators, passengers, and nearby communities. Due to decreasing costs of hydrogen fuel and fuel cell technology, there will be a lower cost for owners of these vessel types which can be directly passed on to operators and passengers. The increased hydrogen consumption through small fast vessels paired with H2FC powertrains will result in increased demand and scale for hydrogen production, distribution, and infrastructure.

Exhibit A Scope of Work

Technological Advancement and Breakthroughs: This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by providing a live demonstration of H2FCs applied to a vessel type that makes up 98 percent of the market. This technological breakthrough will drastically accelerate California's commitment to achieving 100 percent clean energy by 2045. Paired with the Low Carbon Fuel Standard credit program, this technology will allow small fast vessel types to operate with zero-emissions and at reduced fuel costs when compared to diesel or gasoline. With newly proposed Commercial Harbor Craft regulation modifications mandating certain marine harbor craft to use zero emission technology, the technological advancements made through this project will provide comparable performance with conventional fuels. Ports, inland lakes, and waterways across California are developing requirements to lower air pollutant emissions from marine vessels and reduce the chance of liquid fuel spills. This technology would provide a safe, reliable, and cost-efficient solution to the problems impacting these ecologically sensitive environments.

Agreement Objectives

The objectives of this Agreement are to:

- Reduce the size and cost of marine H2FC systems by emulating automotive-style powertrains;
- Develop a flexible powertrain system that can be adaptable to various fuel cell stack manufacturers to meet operating requirements;
- Optimize fuel cell stack operating conditions to achieve desired performance, efficiency, and lifetime;
- Optimize vessel arrangement to maintain expected hull performance;
- Develop a portable and low-cost fueling method for H2FC vessels;
- Acquire regulatory acceptance for safe use of the fuel cell, hydrogen storage, and hydrogen fueling system in a marine environment;
- Develop safety standards for the H2FC vessel and fueling method;
- Develop an on-board hydrogen emergency tank;
- Demonstrate the H2FC vessel for a period of six months or more to analyze vessel performance, fueling performance, costs, maintenance, and safety.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “**days**” means working days.

Exhibit A Scope of Work

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 Energy Commission's software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

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

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Documents intended for public distribution will be in PDF file format.
- The Recipient must also provide the native Microsoft file format.
- 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.

Exhibit A Scope of Work

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

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

MEETINGS

Subtask 1.2 Kick-off Meeting

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

The Recipient shall:

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

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

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

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

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Technical products (subtask 1.1);
 - Progress reports and invoices (subtask 1.5);
 - Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, as needed to reflect any changes in the documents.

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The CAM shall:

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

Recipient Products:

- Updated Project Schedule (*if applicable*)
- Updated List of Match Funds (*if applicable*)
- Updated List of Permits (*if applicable*)

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

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

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

The Recipient shall:

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM

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concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.

- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting

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

The Recipient shall:

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

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

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
 - Disposition of any state-owned equipment.
 - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
 - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential products.
 - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

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Products:

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

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

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

The Recipient shall:

- Submit a 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 Fund and in-state expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **five months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

- **Subtask 1.6.1 Final Report Outline**

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM. (*See Task 1.1 for requirements for draft and final products.*)

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

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

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- **Subtask 1.6.2 Final Report**

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:
 - Cover page (**required**)
 - Credits page on the reverse side of cover with legal disclaimer (**required**)
 - Acknowledgements page (optional)
 - Preface (**required**)
 - Abstract, keywords, and citation page (**required**)
 - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
 - Executive summary (**required**)
 - Body of the report (**required**)
 - References (if applicable)
 - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
 - Bibliography (if applicable)
 - Appendices (if applicable) (Create a separate volume if very large.)
 - Attachments (if applicable)
 - Ensure that the document is written in the third person.
 - Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
 - Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
 - Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
 - Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. 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 Final Report 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.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

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Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

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

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

The Recipient shall:

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

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

- A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
 - If different from the solicitation application, 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.

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Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

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

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

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

Products:

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

Subtask 1.9 Subcontracts

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

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.

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

Products:

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

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

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

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

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

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

Exhibit A Scope of Work

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 insure a long-term perspective on decision-making and progress toward the project's strategic goals.

Exhibit A

Scope of Work

Products:

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

IV. TECHNICAL TASKS

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

TASK 2: DESIGN AND ENGINEERING

The goal of this task is to design, engineer, and render all project specifications related to the vessel, H2FC power system, and refueling system.

Subtask 2.1 Design and Engineering - Vessel

The goal of this subtask is to design, engineer, and render all project specifications related to the vessel.

The Recipient shall:

- Design and engineer a preliminary vessel arrangement.
- Construct a 3D rendering of the vessel.
- Design and engineer internal vessel systems.
- Plan and engineer hull design modifications.
- Design and engineer the vessel’s motor performance specifications.
- Design and engineer the vessel’s propeller specifications.
- Calculate predicted vessel performance.
- Make modifications as needed from equipment and subsystem design changes from design reviews.
- Finalize as-built vessel design.
- Prepare *General Vessel Arrangements and Rendering* that details the vessel design and modifications which allow for the use of a H2FC powertrain.
- Prepare *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- General Vessel Arrangements and Rendering (draft and final)
- CPR Report #1

Subtask 2.2 Design and Engineering – Hydrogen Fuel Cell Power Package

The goals of this subtask are to design and engineer all project specifications related to: 1) Hydrogen Storage; 2) Fuel Cell Package; 3) Electrical Power System; 4) Hydrogen Safety Systems; 5) Control/Automation Software Design; and 6) Control/Automation Hardware Design. In addition, 7) installation, operation, maintenance, and periodic testing procedures will be developed.

Exhibit A Scope of Work

The Recipient shall:

- Define overall specifications including performance requirements, operating and environmental conditions, codes and standards requirements.
- Design and engineer a hydrogen storage system, fuel cell package, electrical power system, hydrogen safety systems, control/automation software and hardware design including details involving:
 - Tank specifications;
 - Process flow, full piping and instrumentation diagrams (P&ID), and process simulation for various operating conditions;
 - preliminary physical layout;
 - 3D modeling of tanks, rack, and internal process piping;
 - Tank rack structural integrity modeling and final project;
 - Hydrogen storage system initial design;
 - Fuel cell evaluation and selection;
 - Systems (hydrogen, air, coolant, exhaust) requirements definition;
 - System design/engineering: process flow, full P&ID, and process simulation for various operating conditions;
 - Equipment specifications;
 - Equipment selection;
 - Estimated high voltage (HV) electrical box requirements;
 - Electrical one-line diagrams;
 - Power simulations;
 - HV wiring schematics and termination sheets;
 - Electronics cooling system(s);
 - Final HV electrical box definition;
 - Electrical power system package initial design complete;
 - Preliminary safety system components and layout;
 - Gas detection system design;
 - Fire protection system design;
 - Fire extinguishing system design;
 - Ventilation system design;
 - Hydrogen venting system design;
 - Control method description;
 - Define hardware requirements;
 - Software, human machine interface design, control parameters;
 - Off-board data handling software;
 - Software initial design complete;
 - Preliminary hardware estimate (controls hardware, low voltage (LV) electrical boxes);
 - Hardware selection;
 - LV wiring schematics, termination sheets;
 - Final LV electrical box requirements and 3D modeling;
 - Installation, operation, maintenance, and periodic testing procedures; and
 - Final as-built designs.
- Prepare a *Power Package Design Report* that includes aspects of the hydrogen storage, fuel cell, electrical power, controls, and safety system designs and consists of:
 - Technical specifications;
 - Process flow diagrams;
 - Physical descriptions;
 - Process, electrical, and control descriptions;

Exhibit A Scope of Work

- Physical layouts; and
- Installation, operation, maintenance, and periodic testing procedures.

Products:

- Power Package Design Report (draft and final)

Subtask 2.3 Design and Engineering – Refueling Systems

The goal of this subtask is to design and engineer all project specifications related to vessel operations involving refueling, more specifically the: (1) Mobile Fueling Source; (2) Interface Package; and (3) Emergency Tank.

The Recipient shall:

- Design and engineer a mobile fueling source, interface package (fuel box), and emergency tank for the vessel including details involving:
 - Packaging and structure design;
 - Process flow, full piping and instrumentation diagram, and process simulation for various operating conditions;
 - 3D modeling of tanks, rack, and internal process piping;
 - Frame/cage structural design and modeling for accident scenarios;
 - Control and automation design including control method, data collection, user interface, software development, and associated testing;
 - Installation, operation, maintenance, and periodic testing procedures;
 - Complete mobile fueling source design;
 - Electrical systems design and wiring schematics;
 - Design changes from installation; and
 - Final as-built designs.
- Prepare a *Refueling Systems Design Report* that includes aspects of the design of the mobile fueling source, fueling interface package, and emergency tank and consists of:
 - Technical specifications;
 - Process, electrical, and control descriptions; and
 - Physical layouts.

Products:

- Refueling Systems Design Report (draft and final)

TASK 3: HYDROGEN SAFETY PLAN AND DESIGN REVIEW

The goal of this task is to develop a hydrogen safety plan that the Recipient and any subcontractors or individuals involved in the construction, operation, and maintenance of the harbor craft will follow throughout the life of the equipment.

The Recipient shall:

- Collaborate with the Pacific Northwest National Laboratory or Center for Hydrogen Safety's Hydrogen Safety Panel (HSP) to ensure the plan is comprehensive and demonstrates a strong commitment to safety.
- Prepare a *Preliminary Hydrogen Safety Plan* that all includes, but are not limited to the following:
 - A description of the Recipient's work and activities to ensure safety, the unique technologies being demonstrated, and the evaluation results of any hazard analysis performed.

Exhibit A Scope of Work

- A description about how the Recipient will adhere to the most recent public guidelines for safety planning for hydrogen and fuel cell projects.
- A description about how the Recipient will conform to the most current version of the National Fire Protection Association 2, Hydrogen Technologies Code being used by the authority having jurisdiction (AHJ) where the facilities and equipment will be located.
- A description about how the Recipient will provide safety training for all operators to conduct the demonstration.
- Submit the *Preliminary Hydrogen Safety Plan* to the HSP for assessment.
- Collaborate with the HSP and the CAM to address questions, comments, or issues pertaining to the plan and prepare a *Final Hydrogen Safety Plan*.
- Participate in design reviews with the HSP before submitting design plans to the AHJ and other relevant regulatory organizations, such as the Federal Railroad Administration or United States Coast Guard.
- Prepare a *Design Review Memo* describing how the HSP's comments will be incorporated into the design plans.

Products:

- Preliminary Hydrogen Safety Plan
- Final Hydrogen Safety Plan
- Design Review Memo

TASK 4: BUILD AND ASSEMBLY

The goal of this task is to complete all initial vessel modifications necessary for preparation of the installation of a hydrogen powertrain, assemble all components of the H2FC power system, and assemble all components of the refueling systems.

The Recipient shall:

- Tear down sections of the vessel to allow access for necessary modifications.
- Make modifications to the vessel outlined in the design and engineering task.
- Reassemble the vessel to be ready for hydrogen powertrain equipment installation.
- Assemble the hydrogen storage system package, fuel cell package, electrical power system package, safety systems, and controls system by completing activities including:
 - Assemble the hydrogen storage system package including the frame, mounting, and hydrogen piping.
 - Assemble the fuel cell package including the frame, mounting, piping, cooling, air and exhausts, and packaging of conversion boxes and energy storage system.
 - Develop procedures, setup, and tests for leak integrity testing.
 - Conduct leak integrity testing for the hydrogen storage system and fuel cell package.
 - Assemble the electrical power system package including the cooling system, high voltage wiring and terminations, low voltage wiring and terminations, and electrical system grounding and isolations.
 - Assemble the safety systems including the ventilation fans, ducting, grills, hydrogen vent piping, hydrogen sensors, and fire extinguishing system.
 - Conduct safety system testing.
 - Assemble the control system including the throttle system, dash controls, controller and data collection hardware packaging, mounting, and wiring.

Exhibit A Scope of Work

- Assemble the mobile fueling tank package, mobile fueling interface package, and emergency tank by completing activities including:
 - Modify the refueling truck as needed to install the mobile fueling tank package.
 - Mount the mobile fueling tank on a rack and install piping.
 - Conduct leak integrity testing for the mobile fueling tank.
 - Install necessary electrical wiring, terminations, controls, and data collection systems.
 - Assemble the mobile fueling interface package including attachment points, power feed, safety interlock, dash control, and associated piping.
 - Conduct leak integrity testing for the mobile fueling interface package.
 - Assemble the emergency tank and associated piping.
 - Conduct leak integrity testing for the emergency tank.
 - Specify any changes to design or procedures based on the as-built conditions of the mobile fueling tank package, refueling truck modifications, mobile fueling interface package, and emergency tank.
- Prepare a *Build and Assembly Report* that includes, but is not limited to:
 - Description of vessel modifications needed to prepare for hydrogen powertrain installation.
 - Description of the assembly and testing of the hydrogen storage system package, fuel cell package, electrical power system package, safety systems, and controls system.
 - Description of the assembly of the mobile fueling tank package, refueling truck modifications, mobile fueling interface package, and emergency tank.
 - Description of any changes to design or procedures based on the as-built conditions of the subsystems.

Products:

- Build and Assembly Report (draft and final)

TASK 5: COMMISSIONING AND TESTING

The goal of this task is to execute all commissioning and testing procedures for the hydrogen storage system, H2FC power system, and refueling systems which includes: (1) mobile fueling source; (2) fuel box; and (3) emergency tank.

The Recipient shall:

- Execute commissioning and testing for the mobile fueling source, fuel box, and emergency tank for the vessel by completing activities including:
 - Nitrogen purge;
 - Test the refueling systems with nitrogen;
 - Conduct a hydrogen purge and first fill; and
 - Finalize mobile fueling source, fuel box, and emergency tank to be ready for use.
- Execute commissioning and testing for the hydrogen storage system by completing activities including:
 - Nitrogen purge.
 - Test the hydrogen storage system with nitrogen;
 - Conduct a hydrogen purge and first fill; and
 - Finalize hydrogen storage system for installation.

Exhibit A Scope of Work

- Execute a bench test of the H2FC power system by completing activities including:
 - Design a bench test regime for the H2FC power system.
 - Setup testing of safety systems, test loads, cooling system, and temporary hook-ups between the hydrogen storage package, fuel cell package, electrical systems package, and controls.
 - Conduct hydrogen leak testing, purge, and first fill.
 - Conduct user interface and controls tests.
 - Test data collection systems.
 - Test performance.
 - Nitrogen purge and disassemble after testing.
 - Specify any needed design changes based on testing results.
 - Specify any needed changes to installation, operation, maintenance, and periodic testing procedures based on testing results.
 - Finalize the H2FC power system for installation.
- Prepare a *Commissioning and Testing Report* that includes, but is not limited to:
 - Overview of purge, fill, and test procedures.
 - Discussion of test setup and test plan.
 - Discussion of commissioning and testing results for the hydrogen storage system, H2FC power system, and refueling systems.
- Prepare *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Commissioning and Testing Report (draft and final)
- CPR Report #2

TASK 6: VESSEL INTEGRATION AND TRIALS

The goal of this task is to finalize the installation of the H2FC power system onto the vessel. The H2FC-powered vessel will undergo initial sea trials to verify final vessel performance specifications.

The Recipient shall:

- Ensure appropriate installation of the H2FC power system through actions including, but is not limited to:
 - Mounting;
 - Final hookups between components;
 - Integration with vessel components (venting, cooling water, vessel electrical),
 - Power-on tests,
 - Nitrogen pure and hydrogen purge,
 - Specify any as-built design changes; and
 - Final assembly of any vessel components or systems.
- Design a test regime for the initial sea trials.
- Design data collection methods for data not automatically captured by the vessel including manual logs and user surveys.
- Perform sea trials to test H2FC power system and vessel performance and data collection methods.
- Measure, verify, and document final vessel performance specifications.

Exhibit A Scope of Work

- Specify any needed changes to operations, maintenance, and periodic testing procedures.
- Make any changes needed to data collection methods.
- Prepare a *Sea Trials Report* that includes, but is not limited to:
 - Overview of sea trials testing regime;
 - Description of manual data collection methods;
 - Final vessel performance specifications; and
 - Discussion of sea trials results.

Products:

- Sea Trials Report (draft and final)

TASK 7: VESSEL DEMONSTRATION

The goal of this task is to plan and conduct the vessel demonstration. The vessel will be demonstrated at multiple sites with continual refueling. Data will be collected throughout the demonstration to quantify vessel performance.

The Recipient shall:

- Design demonstration route(s) for the vessel that is representative of typical real-world operations.
- Make the necessary preparations including refueling strategy, data collection, and route selection to conduct vessel demonstrations in the San Francisco Bay Area and Southern California.
- Prepare a *Vessel Demonstration Plan* that includes, but is not limited to:
 - Demonstration dates, uses, and routes for each demonstration site.
 - Overview of refueling plans, including usage of the mobile fueling source, interface package, and emergency tank.
 - Discussion of data collection plans and methods, including automated data collection and manual data collection through logs and surveys.
- Prepare a *Vessel Demonstration Report* that includes, but is not limited to:
 - Documentation of analyzed data to quantitatively describe vessel and system performance, hydrogen supply and fueling performance, maintenance, safety, costs, and user experiences.

Products:

- Vessel Demonstration Plan (draft and final)
- Vessel Demonstration Report (draft and final)

TASK 8: EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline

Exhibit A Scope of Work

and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

- For Product Development Projects and Project Demonstrations:
 - Published documents, including date, title, and periodical name.
 - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
 - Greenhouse gas and criteria emissions reductions.
 - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
 - Additional Information for Product Development Projects:
 - Outcome of product development efforts, such copyrights and license agreements.
 - Units sold or projected to be sold in California and outside of California.
 - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
 - Investment dollars/follow-on private funding as a result of Energy Commission funding.
 - Patent numbers and applications, along with dates and brief descriptions.
 - Additional Information for Product Demonstrations:
 - Outcome of demonstrations and status of technology.
 - Number of similar installations.
 - Jobs created/retained as a result of the Agreement.
- For Information/Tools and Other Research Studies:
 - Outcome of project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.
 - An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
 - An estimate of energy and non-energy benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.

Exhibit A Scope of Work

- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 9: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
 - A description of the intended use(s) for and users of the project results.
 - Published documents, including date, title, and periodical name.
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
 - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
 - The number of website downloads or public requests for project results.
 - Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- 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.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Exhibit A Scope of Work

Products:

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

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: GOLDEN GATE ZERO EMISSION MARINE, INC.

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

RESOLVED, that the CEC approves Agreement PIR-20-003 with Golden Gate Zero Emission Marine, Inc. for a \$2,000,000 grant to develop a marine hydrogen fuel cell powertrain to power a passenger/patrol vessel. The project will develop a portable refueling system to enable the vessel to be fueled with hydrogen sourced from existing retail stations, avoiding the need for siting shoreside infrastructure. The researchers will demonstrate the completed zero-emission vessel at the Port of San Francisco and Port of Long Beach to validate performance; and

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

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the CEC held on March 17, 2021.

AYE:

NAY:

ABSENT:

ABSTAIN:

Patricia Carlos
Secretariat