

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 02/13)

CALIFORNIA ENERGY COMMISSION

New Agreement ARV-14-025 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
600 Fuels and Transportation Division	David Nichols	27	916-654-4604

Recipient's Legal Name	Federal ID Number
CALSTART, Inc.	94-4375022

Title of Project
Battery Dominant Fuel Cell Hybrid Bus

Term and Amount	Start Date	End Date	Amount
	11 / 18 / 2014	01 / 30 / 2017	\$ 900,000

Business Meeting Information
 ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	11 / 17 / 2014	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	David Nichols	Time Needed:	5 minutes

Please select one list serve. Altfuels (AB118- ARFVTP)

Agenda Item Subject and Description

Proposed resolution approving Agreement ARV-14-025 with CALSTART, Inc. for a \$900,000 grant to develop and demonstrate an innovative, zero-emission Battery Dominant Fuel Cell Hybrid system architecture for a 40-foot heavy-duty transit bus that will reduce the size of the fuel cell power plant, with a goal of reducing the price by 70%. Reducing acquisition costs will make future purchases comparable to today's hybrid costs and make fuel cell hybrid busses more commercially viable for transit authorities.

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":
 Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because the project consists of designing, building, and demonstrating one zero-emission bus.
2. If Agreement is considered a "Project" under CEQA:
 a) Agreement **IS** exempt. (Attach draft NOE)
 Statutory Exemption. List PRC and/or CCR section number: _____
 Categorical Exemption. List CCR section number: _____
 Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section:
- b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)
 Check all that apply
 Initial Study Environmental Impact Report
 Negative Declaration Statement of Overriding Considerations
 Mitigated Negative Declaration

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

Legal Company Name:	Budget
US Hybrid (including match funds)	\$ 804,960
EIDorado National	\$ 426,000
see additional sheet	\$

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

Legal Company Name:
SunLine Transit Agency
see additional sheet

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Budget Information			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
ARFVTF	13/14	601.118F	\$495,000
ARFVTF	14/15	601.118G	\$405,000
Funding Source			\$
Funding Source			\$
Funding Source			\$
R&D Program Area: N/A		TOTAL:	\$900,000
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer				Recipient's Project Manager			
Name:	Leo Ayalew			Name:	Lawrence Wnuk		
Address:	48 S. Chester Avenue			Address:	48 S. Chester Avenue		
City, State, Zip:	Pasadena, CA 91106			City, State, Zip:	Pasadena, CA 91106		
Phone:	626-744-5617	Fax:	626-744-5610	Phone:	626-744-5685	Fax:	626-744-5610
E-Mail:	LAyalew@calstart.org			E-Mail:	LWnuk@calstart.org		

Selection Process Used	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: PON-13-604
<input type="checkbox"/> First Come First Served Solicitation	

The following items should be attached to this GRF			
1. Exhibit A, Scope of Work		<input checked="" type="checkbox"/>	Attached
2. Exhibit B, Budget Detail		<input checked="" type="checkbox"/>	Attached
3. CEC 105, Questionnaire for Identifying Conflicts		<input checked="" type="checkbox"/>	Attached
4. Recipient Resolution		<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
5. CEQA Documentation		<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached

_____ Agreement Manager	_____ Date	_____ Office Manager	_____ Date	_____ Deputy Director	_____ Date
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CEC-270 Attachment #1 Subcontractors and Key Partners

The Federal Transit Administration is funding additional work for the Recipient under a separate agreement with the following subcontracts and key partners:

SunLine Transit Agency

EIDorado National

US Hybrid

Hydrogenics Corporation

BAE Systems

Exhibit A SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		Administration
2		Full Team Project Kick-off
3	X	Design Battery Dominant Fuel Cell Hybrid Bus
4		Procure/Fab/Build Battery Dominant Fuel Cell Hybrid Bus
5		Conduct Power Train Lab Integration and Test
6		Conduct Battery Dominant Fuel Cell Hybrid Bus Vehicle Integration and Test
7		Conduct Fleet Operations
8		Conduct Final Review/Submit Final FTA Report

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Lawrence Wnuk	EIDorado National, US Hybrid	SunLine Transit
	Tommy Edwards, Rudy LeFlore	BAE Systems, Hydrogenics, EIDorado National, US Hybrid	SunLine Transit
2	Tommy Edwards,	BAE Systems, Hydrogenics, EIDorado National, US Hybrid	SunLine Transit
3	Rudy LeFlore		SunLine Transit
4	Robert Devine		SunLine Transit
5	Rob Del Core		SunLine Transit
6	Gentry Shaw		SunLine Transit
	Abas Goodarzi		SunLine Transit
7	Tommy Edwards, Rudy LeFlore	BAE Systems, Hydrogenics, EIDorado National, US Hybrid	
8	Lawrence Wnuk Tommy Edwards, Rudy LeFlore Robert Devine Rob Del Core Gentry Shaw Abas Goodarzi	BAE Systems, Hydrogenics, EIDorado National, US Hybrid	SunLine Transit

Exhibit A SCOPE OF WORK

GLOSSARY

Specific terms and acronyms used throughout this scope of work are defined as follows:

Term/ Acronym	Definition
AFCB	American Fuel Cell Bus
ARFVTP	Alternative Renewable Fuel and Vehicle Technology Program
BD-FCHB	Battery Dominant Fuel Cell Hybrid Bus
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
Energy Commission	California Energy Commission
FCB	Fuel Cell Bus
FTD	Fuels and Transportation Division
FTA	Federal Transit Administration
Glider	The basic bare fuel cell bus - less propulsion, power electronics and electronics accessories equipment
KPP	Key Performance Parameters
LRU	Line Replaceable Unit
NFCB	National Fuel Cell Bus
Recipient	Grant Recipient – Direct Recipient of Grant from the California Energy Commission
Sub-Contractor	A team member subcontracted to provide a product or service or combination of the two
Sub-Recipient	Transit Agency teamed with the recipient - The sub-recipient will execute and administer subcontracts
Supplier	Provider of off-the-shelf products
SW	Software
SIL	System Integration Laboratory
Vdc	Volts direct current

BACKGROUND:

Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). The statute authorizes the California Energy Commission (Energy Commission) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state’s climate change policies. AB 8 (Perea, Chapter 401, Statutes of 2013) re-authorizes the ARFVTP through January 1, 2024, and specifies that the Energy Commission allocate up to \$20 million per year (or up to 20 percent of each fiscal year’s funds) in funding for hydrogen station development until at least 100 stations are operational. The Energy Commission has an annual program budget of approximately \$100 million and provides financial support for projects that:

- Develop and improve alternative and renewable low-carbon fuels;

Exhibit A SCOPE OF WORK

- Optimize alternative and renewable fuels for existing and developing engine technologies;
- Produce alternative and renewable low-carbon fuels in California;
- Decrease, on a full fuel cycle basis, the overall impact and carbon footprint of alternative and renewable fuels and increase sustainability;
- Expand fuel infrastructure, fueling stations, and equipment;
- Improve light-, medium-, and heavy-duty vehicle technologies;
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets;
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors;
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

The California Energy Commission issued PON-13-604 to leverage ARFVTP funds to bring federal cost-sharing projects to California that will improve air quality, reduce petroleum consumption and decrease greenhouse gas emissions (GHG). In response to the solicitation, Recipient submitted application #1 (the "Application"), which was proposed for funding in the Energy Commission's Notice of Proposed Awards issued February 27, 2014, and amended on July 3, 2014. Both the Application and the solicitation are hereby incorporated by reference into this Agreement.

In the event of any conflict or inconsistency between the terms of the solicitation and the terms of the Recipient's Application, the solicitation shall control. In the event of any conflict or inconsistency between the Recipient's Application and the terms of the Energy Commission's Award, the Energy Commission's Award shall control. In the event of any conflict or inconsistency between the terms of this Agreement and the Recipient's Application, the terms of this Agreement shall control.

Problem Statement: The Fuel Cell Bus (FCB) offers an attractive, effective method of achieving the California Energy Commission (Energy Commission) chartered objective of helping to attain the state's climate change policies. A major roadblock to large scale FCB use is cost. Reduction of FCB cost is necessary to support commercialization of the technology and its affordable commercial use. This project associated with this Agreement addresses that problem.

Goals of the Agreement:

- Develop and demonstrate a Battery Dominant Fuel Cell Hybrid Bus that meets or exceeds the performance requirements of the Federal Transit Agency's (FTA) National Fuel Cell Bus (NFCB) Program
- Significantly reduce the size and cost of the fuel cell power plant by 70%
- Optimize fuel cell application for transit applications
- Further develop the vital supply chain to support fuel cell transit bus growth
- Spur commercialization of Fuel Cell Hybrid Bus Technology
- Help California achieve its climate change, air quality, and emissions reduction goals

Exhibit A SCOPE OF WORK

- Move fuel cell technology on transit buses further down a viable commercialization path so they are a viable cost effective option to California transit bus fleets within 2-4 years

Objectives of the Agreement: Based upon the project team's success with the seventh-generation American Fuel Cell Bus (AFCB), the quantitative and measureable objectives of this project are to:

- **Lower** the cost of the fuel cell power plant by 70 percent
- **Improve** air quality by operating the proposed zero-emission Battery Dominant Fuel Cell Bus for 60,000 miles over the 12-month operations phase
- **Reduce** petroleum consumption by 11,250 gallons of diesel fuel over the 12 month operations phase
- **Decrease** greenhouse gas emissions in California by eliminating 550,000 lbs. of carbon dioxide into the California's air over the 12 month operations phase

This agreement provides an Energy Commission Grant designed to leverage the existing federal funding for the FTA Battery Dominant Fuel Cell Hybrid Bus (BD-FCHB) selected under the NFCB Program on September 5, 2013 for California Benefit. The work scope "The Recipient shall" included in the following tasks is the scope that is funded by the Energy Commission grant as well as tasks that are funded by the FTA and matching funds. Products shown are limited to the products to be delivered to the Energy Commission under this Grant. A further description of the overall FTA program and its schedule and tasks is provided in Section D, 6.0 of the Grant Application.

The Recipient is ultimately responsible to the Energy Commission for the total project performance, including many of the tasks that are implemented by the Sub-Recipient, Sub-Contractor, and Supplier Team under direction of the Recipient. As the Energy Commission project is leveraging the overall FTA Battery Dominant Bus project and its cost share, this Work statement contains Tasks and Products that are based upon the full FTA project. This is to demonstrate the overall integrated project and its planning.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement. The Commission Agreement Manager (CAM) shall designate the date and location of this meeting and provide an agenda to the Recipient prior to the meeting.

Exhibit A SCOPE OF WORK

The Recipient shall:

- Attend a “Kick-Off” meeting with the CAM, the Commission Agreement Officer (CAO), and a representative of the Accounting Office. The Recipient shall bring its Project Manager, Agreement Administrator, Accounting Officer, and others designated by the CAM to this meeting.
- Discuss the following administrative and technical aspects of this Agreement:
 - Agreement Terms and Conditions
 - Critical Project Review (Task 1.2)
 - Match fund documentation (Task 1.6) No reimbursable work may be done until this documentation is in place.
 - Permit documentation (Task 1.7)
 - Subcontracts needed to carry out project (Task 1.8)
 - The CAM’s expectations for accomplishing tasks described in the Scope of Work
 - An updated Schedule of Products and Due Dates
 - Monthly Progress Reports (Task 1.4)
 - Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
 - Final Report (Task 1.5)

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds
- Updated List of Permits

CAM Product:

- Kick-Off Meeting Agenda

Task 1.2 Critical Project Review (CPR) Meetings

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

The CAM may schedule CPR meetings as necessary, and meeting costs will be borne by the Recipient.

Exhibit A SCOPE OF WORK

Meeting participants include the CAM and the Recipient and may include the CAO, the Fuels and Transportation Division (FTD) bio fuel lead, other Energy Commission staff and Management as well as other individuals selected by the CAM to provide support to the Energy Commission.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. Prepare a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see section 8 of the Terms and Conditions). If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Lead Commissioner for Transportation for his or her concurrence.
- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the CAM and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

CAM Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Exhibit A

SCOPE OF WORK

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the CAO, and the CAM. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the CAM.

The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The CAM will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the CAM and the CAO about the following Agreement closeout items:

- What to do with any equipment purchased with Energy Commission funds (Options)
- Energy Commission's request for specific "generated" data (not already provided in Agreement products)
- Need to document Recipient's disclosure of "subject inventions" developed under the Agreement
- "Surviving" Agreement provisions
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the objectives of this Agreement on time and within budget.

Exhibit A SCOPE OF WORK

The objectives of this task are to 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, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the CAM within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Section 6 of the Terms and Conditions of this Agreement.
- In the first Monthly Progress Report and first invoice, document and verify match expenditures and provide a synopsis of project progress, if match funds have been expended or if work funded with match share has occurred after the notice of proposed award but before execution of the grant agreement. If no match funds have been expended or if no work funded with match share has occurred before execution, then state this in the report. All pre-execution match expenditures must conform to the requirements in the Terms and Conditions of this Agreement.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving the Agreement's goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements to the FTD project management processes.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following activities for both the public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report, if requested by the CAM.

Exhibit A SCOPE OF WORK

- Prepare a Final Report following the latest version of the Final Report guidelines which will be provided by the CAM. The CAM shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed at least 60 days before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Outline of the Final Report, if requested
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of Energy Commission funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

Prepare a letter documenting the match funding committed to this Agreement and submit it to the CAM at least 2 working days prior to the kick-off meeting. 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 such 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 each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
- Amount of each in-kind contribution, a description, documented market or book value, and its 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 shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.

Exhibit A SCOPE OF WORK

- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the CAM if during the course of the Agreement additional match funds are received.
- Notify the CAM within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR meeting.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task 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. Although the Energy Commission budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the CAM at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit

Exhibit A SCOPE OF WORK

- Name, address and telephone number of the permitting jurisdictions or lead agencies
- The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement 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 the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the CAM.
- As permits are obtained, send a copy of each approved permit to the CAM.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- A copy of each approved permit (if applicable)
- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)
- A copy of each final approved permit (if applicable)

Task 1.8 Obtain and Execute Subcontracts

The goal of this task is to ensure quality products and to procure subcontractors required to carry out the tasks under this Agreement consistent with the Agreement Terms and Conditions and the Recipient's own procurement policies and procedures. It will also provide the Energy Commission an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement, and that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Manage and coordinate subcontractor activities.
- Submit a draft of each subcontract required to conduct the work under this Agreement to the CAM for review.

Exhibit A SCOPE OF WORK

- Submit a final copy of the executed subcontract.
- If Recipient decides to add new subcontractors, then the Recipient shall notify the CAM.

Products:

- Letter describing the subcontracts needed, or stating that no subcontracts are required
- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 FULL TEAM PROJECT KICK-OFF

The goal of this task is to review and validate the Battery Dominant Fuel Cell Hybrid Bus project implementation plan, establish team roles and responsibilities, lines of communications, and the procedures for implementing the agreement within the project team.

The Recipient shall:

- Produce Project Kick-off Meeting Agenda
- Conduct an implementation “Kick-Off” meeting with the Sub-Recipient and the major project subcontractors.
- Discuss the following:
 - Results of the Recipient’s Kick-off Meeting with the Energy Commission CAM
 - Roles and Responsibilities of each project participant (Recipient, Sub-Recipient and Major Sub-Contractors)
 - Project Technical Approach
 - Validate system technical requirements
 - Project Products and Deliverables
 - Lines of communications for the project
 - Schedule of Products and Due Dates
 - Validate hand-offs between team members
 - Critical Program Review (CPR) Schedule
 - Project Reporting Requirements
 - Monthly Progress Reports

Exhibit A SCOPE OF WORK

- Final Reports
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA

Products:

- Project Kick-off Meeting Agenda
- Copy of the Federal Monthly Report that Recipient submits to the FTA

TASK 3 DESIGN BATTERY DOMINANT FUEL CELL HYBRID BUS

Task 3.1 Initiate Program Start-up

The goal of this task is to set up the program to ensure that program objectives are clearly understood by all participants, subcontracts are in place with appropriate flow downs, and that detailed planning is complete and that handoff and delivery requirements are validated and documented.

The Recipient shall:

- Initiate and execute Subcontracts with each subcontractor (See Task 1.8), and flow the appropriate elements of this Scope of Work to the Sub-Recipient and each subcontractor
- Review and validate each subcontractor's project plan to include:
 - Technical Performance Measurement and Key Performance Parameters (KPPs)
 - Schedule of Products and Due Dates (including handoffs)
 - Match Fund plan and status
 - Risk identification and management
 - Key Personnel Status (if Applicable)
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA. Also include:
 - Status of Match funds and any match share expended between the Notice of Potential Award and the execution of the Grant Agreement
 - That subcontractors have initiated the project work per the project plan and any updates with regards to the Schedule of Products and Due Dates and the Match Fund plan

Products:

- Approved and Executed Subcontracts

Exhibit A SCOPE OF WORK

- Copy of the Federal Monthly Report that Recipient submits to the FTA with additional information requested

Task 3.2 Define Battery Dominant Fuel Cell Hybrid Bus System Requirements

The goal of this task is to conduct systems engineering analysis and generate updated BD-FCHB system requirements. The design effort is to define the electrical and mechanical integration of the systems and the specific application requirements for the BD-FCHB. The System Requirements task also defines the electrical accessories to be installed and integrated on the bus.

The Recipient shall:

- Define Battery Dominant Fuel Cell Bus Requirements/Analysis to include:
 - System/Platform (Bus) Level Requirements Analysis
 - System Architecture and Design
 - Vehicle Level Software (SW) High Level Requirements
 - Modeling and Simulation
 - DC/DC Converter Systems Requirements
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA

Products

- Copy of the Federal Monthly Report that Recipient submits to the FTA

Task 3.3 Design BD-FCH Bus System Design Updates

The goal of this task is to conduct hardware and software design of the Battery Dominant Fuel Cell Bus per the system requirements from Task 3.2.

The Recipient shall:

- Complete Battery Dominant Fuel Cell Bus Design Updates to include:
 - Vehicle Design/Mechanical Layout
 - Vehicle Level SW High Level Design
 - Cooling System Architecture and Design
 - Power Distribution Unit Architecture and Design
 - Wire Harness Design

Exhibit A SCOPE OF WORK

- Vehicle Maintenance/Mount Design
- Failure Modes Effects Analysis
- Safety Analysis
- Software Design
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA

Products:

- Copy of the Federal Monthly Report that Recipient submits to the FTA

Task 3.4 Conduct a Battery Dominant Fuel Cell Hybrid Bus Design Review

The goal of this task is to conduct a Battery Dominant Fuel Cell Hybrid Bus design review to demonstrate design compliance to the agreed upon system requirements.

The Recipient shall:

- Provide a Design Review Package 15 Days prior to the Design Review including:
 - Design Review Agenda
 - Design Review Technical Package
 - Status of outstanding Action Items
- Conduct the Design Review
- Generate Review Meeting Minutes to include:
 - Results of the Design Review
 - Design Review Meeting Action Items, Owner and Due Date
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA

Products:

- Design Review Meeting Minutes Draft
- Design Review Meeting Minutes Final
- Copy of the Federal Monthly Report that Recipient submits to the FTA

[CPR WILL OCCUR DURING THIS TASK. SEE TASK 1.2 FOR DETAILS]

Exhibit A SCOPE OF WORK

TASK 4 PROCURE/FAB/BUILD BATTERY DOMINANT FUEL CELL HYBRID BUS

The goal of this task is to procure all necessary materials and equipment and to fabricate and build the Battery Dominant Fuel Cell Hybrid Bus for integration.

The Recipient shall:

- Identify long lead and miscellaneous material and produce List of Long Lead and Miscellaneous Material Part Numbers
- Procure long lead and miscellaneous material
- Procure:
 - Fuel Cell package
 - Hybrid Power and Propulsion System
 - Glider components
- Fabricate and Test the Fuel Cell package
- Fabricate and test the FC Hybrid Power and Propulsion System Line Replaceable Units (LRU)
- Deliver the FC Hybrid Power and Propulsion System LRU for integration/lab test
- Manufacture the Glider
- Deliver the Fuel Cell to the System Integration Lab for Propulsion Systems Integration and Test and produce Written Notification of Delivery

Products:

- List of Items Procured under Energy Commission Grant
- Written Notice of Delivery

TASK 5 CONDUCT POWER TRAIN LAB INTEGRATION AND TEST

The goals of this task are to prepare the System Integration Lab (SIL) to conduct Power Train Integration and Test, to conduct testing, and to deliver the Glider Bus to BAE Systems.

The Recipient shall:

- Set up the SIL for Power Train Lab and Integration Test prior to installing the power train on the vehicle
- Develop Integration and Test Plan
- Conduct Power Train Integration

Exhibit A SCOPE OF WORK

- Conduct Power Train System Test
- Prepare Integration and Test Results
- Deliver the Glider for Vehicle Integration and Test at BAE Systems
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA

Products:

- Copy of the Federal Monthly Report that Recipient submits to the FTA

TASK 6 CONDUCT BATTERY DOMINANT FUEL CELL HYBRID BUS VEHICLE INTEGRATION AND TEST

The goals of this task are to complete the mechanical installation and integration of the Battery Dominant Fuel Cell Bus components (BD-FCHB) with the Glider; conduct Vehicle Level System integration of the Battery Dominant Fuel Cell Bus (BD-FCHB); complete the final finish and preparation of the Battery Dominant Fuel Cell Bus (BD-FCHB) for delivery; and deliver the Integrated and tested Battery Dominant Fuel Cell Hybrid Bus to SunLine Transit.

The Recipient shall:

- Install and physically integrate the BD-FCHB components with the Glider vehicle. Components include:
 - Fuel Cells
 - Energy Storage
 - Power Train and Power Electronics and control
 - Accessory Systems
- Conduct Vehicle Level System Integration. Integration includes:
 - Fuel Cells
 - Energy Storage System
 - Power Train
 - Power Conversion
 - Power Control and Accessories, such as:
 - Air Compressor
 - Air Conditioning System
 - Power Steering Pump
 - Volts Direct Current (Vdc) accessories hardware

Exhibit A SCOPE OF WORK

- System software and firmware
- Develop Vehicle Level Test Plan
- Conduct Vehicle Level Test
- Prepare Vehicle Integration and Test Results
- Complete the final finish and preparation of the BD-FCHB for delivery
- Provide a copy of the Federal Monthly Report that Recipient submits to the FTA
- Deliver Integrated and tested Battery Dominant Fuel Cell Hybrid Bus to SunLine Transit; Prepare Written Notification of Delivery

Products:

- Copy of the Federal Monthly Report that Recipient submits to the FTA
- Written Notification of Delivery

TASK 7 – CONDUCT FLEET OPERATIONS

Task 7.1 Conduct Training and Service Demo

The goal of this task is to Conduct Training of SunLine personnel in the operation and preventative/routine maintenance of the BD-FCHB and to conduct a service demonstration.

The Recipient shall:

- Prepare Written and Audiovisual Training Material
- Conduct BDFCB Training
- Conduct a service demo and prepare Service Demo Results document

Products:

- Written and Audio Visual Training Material
- Service Demo Results (for inclusion in Final Report)

Task 7.2 Conduct Fleet Service

The goal of this task is to conduct 12 months of fleet service of the BD-FCHB at SunLine Transit in the Coachella Valley, California.

Exhibit A SCOPE OF WORK

The Recipient shall:

- Place the BD-FCHB in Fleet Service
- Run other bus types (initial F C B, conventional bus) on the same route with the same duty cycle, collecting data to provide apples to apples comparison of availability, bus performance, fuel consumption and air quality measures.
- Prepare Fleet Service Data document
- Analyze Fleet Service Data and prepare Analysis of Fleet Service Data that includes summary of KPP for the BD-FCHB and the buses used for comparison

Products:

- Fleet Service Data
- Analysis of Fleet Service Data

Task 7.3 Data Collection and Analysis

The goal of this task is to collect operational data from the project, to analyze that data for economic and environmental impacts, and to include the data and analysis in the Final Report.

The Recipient shall:

- Develop data collection test plan.
- Troubleshoot any issues identified.
- Collect 6 months of throughput, usage, and operations data from the project including, but not limited to:
 - Maximum capacity of the new fueling system
 - Gallons of gasoline and/or diesel fuel displaced (with associated mileage information)
 - Expected air emissions reduction, for example:
 - Non-methane hydrocarbons
 - Oxides of nitrogen
 - Non-methane hydrocarbons plus oxides of nitrogen
 - Particulate Matter
 - Formaldehyde
 - Duty cycle of the current fleet and the expected duty cycle of future vehicle acquisitions

Exhibit A SCOPE OF WORK

- Specific jobs and economic development resulting from this project
- Identify any current and planned use of renewable energy at the facility.
- Identify the source of the alternative fuel.
- Describe any energy efficiency measures used in the facility that may exceed Title 24 standards in Part 6 of the California Code Regulations.
- Provide data on potential job creation, economic development, and increased state revenue as a result of expected future expansion.
- Provide a quantified estimate of the project's carbon intensity values for life-cycle greenhouse gas emissions.
- Compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments.
- Collect data, information, and analysis described above and include in the Final Report.

Products:

- Data collection information and analysis will be included in the Final Report

TASK 8 – CONDUCT FINAL REVIEW/SUBMIT FINAL FTA REPORT

Task 8.1 Conduct Final FTA Project Review

The goal of this task is to review the technical results of the demonstration/fleet service against the established FTA objectives before completion of the final FTA report and project closeout. The review shall include review of the analysis and comparison data to project objectives (Key Performance Parameters), a summary of the project results, an assessment of progress towards commercialization, as well as lessons learned and recommendations for future efforts.

The Recipient shall:

- Determine the date, and time of the final review with the participants. This meeting shall be a teleconference scheduled by the Recipient.
- Generate a Review Agenda and a list of expected participants 15 days prior to the review. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and document the meeting in a Final FTA Review Package
- Discuss any project closeout actions.

Exhibit A SCOPE OF WORK

Products:

- No Energy Commission Products

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: CALSTART, INC.

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

RESOLVED, that the Energy Commission approves Agreement ARV-14-025 with **CALSTART, INC.** for a **\$900,000** grant to develop and demonstrate an innovative, zero-emission battery dominant fuel cell hybrid system architecture for a 40-foot heavy-duty transit bus that will reduce the size of the fuel cell power plant, with a goal of reducing the price by 70 percent. Reducing acquisition costs will make future purchases comparable to today's hybrid costs and make fuel cell hybrid buses more commercially viable for transit authorities; and

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

CERTIFICATION

The undersigned Secretariat to the Commission 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 California Energy Commission held on November 17, 2014.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Harriet Kallemeyn,
Secretariat