

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 02/13)

CALIFORNIA ENERGY COMMISSION

New Agreement ARV-14-003 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
600 Fuels and Transportation Division	Phil Cazel	27	916-653-1590

Recipient's Legal Name	Federal ID Number
Institute of Gas Technology dba Gas Technology Institute	36-2170137

Title of Project
Hydrogen Mobile Refueler - II

Term and Amount	Start Date	End Date	Amount
	7 / 30 / 2014	12 / 31 / 2016	\$ 999,677

Business Meeting Information			
<input type="checkbox"/> ARFVTP agreements under \$75K delegated to Executive Director.			
Proposed Business Meeting Date	07 / 22 / 2014	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Phil Cazel	Time Needed:	5 minutes
Please select one list serve. Altfuels (AB118- ARFVTP)			

Agenda Item Subject and Description
Proposed resolution approving Grant Agreement ARV-14-003 with Gas Technology Institute for \$999,677 to design, fabricate, test, and deploy a fully operational, commercial mobile hydrogen refueler configured on a medium-duty Ford F550 platform with hydrogen storage, compression, and dispensing capabilities. The mobile refueler will be self powered by a zero emission on-board hydrogen fuel cell and have the capability to fill either 350 Bar or 700 Bar vehicle tanks through onboard metered dispensing hoses.

California Environmental Quality Act (CEQA) Compliance
1. Is Agreement considered a "Project" under CEQA? <input checked="" type="checkbox"/> Yes (skip to question 2) <input type="checkbox"/> 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 .
2. If Agreement is considered a "Project" under CEQA: <input checked="" type="checkbox"/> a) Agreement IS exempt. (Attach draft NOE) <input type="checkbox"/> Statutory Exemption. List PRC and/or CCR section number: _____ <input type="checkbox"/> Categorical Exemption. List CCR section number: _____ <input checked="" type="checkbox"/> Common Sense Exemption. 14 CCR 15061 (b) (3) Explain reason why Agreement is exempt under the above section: There is no possibility that the activity in question may have a significant effect on the environment. The project funds the design, fabrication, testing, and deployment of a fully operational, commercial mobile hydrogen refueler configured on a medium-duty Ford F550 platform with hydrogen storage, compression, and dispensing capabilities. The compressor and dispensing equipment will be powered by a zero emission on-board hydrogen fuel cell.
<input type="checkbox"/> b) Agreement IS NOT exempt. (Consult with the legal office to determine next steps.) Check all that apply <input type="checkbox"/> Initial Study <input type="checkbox"/> Environmental Impact Report <input type="checkbox"/> Negative Declaration <input type="checkbox"/> Statement of Overriding Considerations <input type="checkbox"/> Mitigated Negative Declaration

List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)	
Legal Company Name:	Budget
US Hybrid	\$ 400,000
H2 Frontier, Inc.	\$ 375,000
	\$

List all key partners: (attach additional sheets as necessary)	
Legal Company Name:	
US Hybrid	
H2 Frontier, Inc.	

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Budget Information			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
ARFVTF		601.118	\$999,677
Funding Source			\$
R&D Program Area:	N/A	TOTAL:	\$999,677
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer				Recipient's Project Manager			
Name:	Fred Vitalo			Name:	Ted Barnes, P.E.		
Address:	1700 South Mount Prospect Road			Address:	1700 South Mount Prospect Road		
City, State, Zip:	Des Plaines, Illinois 60018			City, State, Zip:	Des Plaines, Illinois 60018		
Phone:	847-768-0761	Fax:	847-768-0984	Phone:	847-544-3405	Fax:	847-768-0501
E-Mail:	fred.vitalo@gastechnology.org			E-Mail:	ted.barnes@gastechnology.org		

Selection Process Used	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: PON-13-607
<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

SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		Administration
2		Vehicle and Power System Design
3		Compression, Storage, and Dispensing System Design
4	X	Procurement, Integration, and Assembly
5		Deployment, Becoming Operational, and Continuing Operation
6		Data Collection and Analysis

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Ted Barnes (PM)		
2	Abas Goodarzi	US Hybrid	
3	Dan Poppe	H2 Frontier	
4	Ted Barnes	US Hybrid, H2 Frontier	
5	Dan Poppe	H2 Frontier	
6	Ted Barnes, Dan Poppe, Abas Goodarzi	US Hybrid, H2 Frontier	

GLOSSARY

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

Term/ Acronym	Definition
ARFVTP	Alternative and Renewable Vehicle and Technology Program
BOP	Balance of Plant
CAM	Commission Agreement Manager
CPR	Critical Project Review
FTD	Fuels and Transportation Division
NOPA	Notice of Proposed Award
NREL	National Renewable Energy Laboratory
OEM	Original Equipment Manufacturer
Recipient	Gas Technology Institute
SAE	Society of Automotive Engineers International

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;
- 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; and
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

The Energy Commission issued solicitation PON-13-607 to develop infrastructure necessary to dispense hydrogen transportation fuel and to support hydrogen refueling operations prior to the large-scale roll-out of fuel cell vehicles. To be eligible for funding under PON-13-607, the projects must also be consistent with the Energy Commission's ARFVT Investment Plan updated annually. In response to PON-13-607, the Gas Technology Institute (Recipient) submitted application number 14, which was proposed for funding in the Energy Commission's Notice of Proposed Awards (NOPA) on May 1, 2014. PON-13-607 and Recipient's application number 14 are hereby incorporated by reference into this Agreement in their entirety.

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. Similarly, 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:

California has the most extensive fleet of fuel cell vehicles in the nation, supported by the nation's largest network of hydrogen fueling stations. There are currently 9 public stations in operation with additional stations planned and under construction. Even though additional stations are expected to become available over the next few years as a result of the Energy

Commission's solicitation PON-13-607 and other funding efforts, there is little or no redundancy in the network. Consequently, the impact of a station going out of service due to planned or unplanned maintenance can leave fuel cell vehicle owners without a source of fuel until the station comes back on line. Additionally, there are various ride-and-drive vehicle demonstration activities that occur throughout the state, requiring temporary, on-site fuel supplies.

Station down-time and lack of infrastructure back-up leads to the perception that advanced vehicle technologies are unreliable, and thereby undermines the State's clean energy and zero-emissions goals. It also represents a real inconvenience and cost to drivers and operators of fuel cell vehicles, who rely on their vehicles for their daily work activities.

Goals of the Agreement:

The goal of this agreement is to design, build, test, and deploy a fully operational, commercial mobile hydrogen refueler using an on board zero emission fuel cell to power an on-board hydrogen compressor. The mobile refueler will be based on a medium-duty truck platform and will include communication and non-communication refueling capabilities at 350 bar and 700 bar through a metered fuel dispenser. The mobile refueler will have the capability to fill either 350 bar or 700 bar vehicle tanks or refill a station's hydrogen storage tanks. Vehicle refueling will occur at existing hydrogen refueling stations or vehicle demonstration events and not as a roadside service.

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.

The Recipient shall:

- Attend a "Kick-Off" meeting with the CAM, the Grants Officer, 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.

Meeting participants include the CAM and the Recipient and may include the Commission Grants Officer, the Fuels and Transportation Division (FTD) hydrogen 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)

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 Commission Grants Office Officer, 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 Grants Officer 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.

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.
- Monthly Progress Reports shall include hydrogen quality test results at least once every 6 months, and more frequently if the hydrogen lines are exposed to contamination due to maintenance or other activity. (See requirements in PON-13-607 Section IV. Subsection A.)
- Monthly Progress Reports shall also include the dispenser compliance with SAE International Technical Information Report (TIR) J2601: 2010, "Fueling Protocols for Light Duty Gaseous Hydrogen Surface" Vehicles(general requirements and operating conditions for fuel cell vehicles) until which time the SAE International SAE J2601 Standard is published. Thereafter, the dispenser(s) shall meet the requirements of the standard (www.sae.org), to the extent practicable. The mobile refueler shall have communications available for H70 fueling according to the SAE J2799 Standard. Should the SAE International J2601 Standard not be available, the dispensers(s) shall be capable of providing SAE TIR J2799: 2007, "70 MPa Compressed Hydrogen Surface Vehicle Fueling Connection Device and Optional Vehicle to Station Communications".
- Monthly Progress Reports shall also include the amount of hydrogen dispensed per month in kilograms.
- 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 NOPA 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. The Recipient shall perform the following activities for the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report, as requested by the CAM.
- 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. 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.
- 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, including but not limited to any requirements of the U.S. Department of Transportation or the California Department of Transportation or Highway Patrol.

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

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

Products:

- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 VEHICLE AND POWER SYSTEM DESIGN

The goal of this task is to design the mobile refueler's vehicle and on-board power system configuration and specifications.

The Recipient shall:

- Design the size, power, and load capacity requirements for vehicle and all on-board power systems as calculated in Task 3.
- Design vehicle and power control systems to meet the OEM and end-user field operation requirements.
- Specify and order major vehicle and power systems components including:
 - Vehicle (Ford F 550 truck chassis including, but not limited to weight rating, hauling capacity, engine attributes, and auxiliaries)
 - Fuel cell (HDC30 Hydrogenics)
 - Power converters (CV35 + DC 07)
 - Cooling system
 - Auxiliary power system
 - Electric-hydraulic drive system components
 - Battery energy storage system

Products:

- On board power systems design report
- Vehicle and power control systems design report
- List of vehicle and power systems components

TASK 3 COMPRESSION, STORAGE, AND DISPENSING SYSTEM DESIGN

The goal of this task is to design the mobile refueler system's compression, storage, and dispensing configuration and specifications to meet the OEM and end-user field operation requirements for mobile hydrogen refueling. All sizing calculations will be performed for system components and compression, storage, and dispensing system components will be ordered.

The Recipient shall:

- Calculate the size and power requirements for compression, storage, and dispensing components
- Design compression, storage, and dispensing configuration to meet OEM and end-user field operation requirements and integrate with Task 2.

- Order major compression, storage, and dispensing components including:
 - 450 bar hydrogen storage tanks and BOP
 - 700 bar buffer tank and BOP
 - Hydrogen compressor (350 bar and 700 bar)
 - Priority Panel and BOP
 - Hydraulic system and cooling
 - Dispenser and SAE J2601 compatible controls
 - Hydrogen dispenser pre-cooling system

Products:

- Sizing calculations report for compression, storage, and dispensing components
- Compression, storage, and dispensing systems design report
- List of major compression, storage, and dispensing components

TASK 4 PROCUREMENT, INTEGRATION, AND ASSEMBLY

The goal of this task is to procure all system components and integrate the vehicle and power systems with the compression, storage, and dispensing systems for the mobile refueler.

The Recipient shall:

- Perform a HAZOP review prior to final integrated design and assembly.
- Create an integrated design package, including piping and instrumentation design drawings, assembly drawings, and BOP materials specifications.
- Complete fabrication, assembly, and performance testing of components.
- Develop operations and maintenance manual(s) for truck, fuel cell, hydraulics, compression, storage, and dispensing components.
- Develop emergency response manuals for compression, storage, and dispensing components.

Products:

- Summary report of HAZOP review
- Integrated design package report
- Fabrication, assembly, and validation testing report
- Copy of operations and maintenance manual(s) for truck, fuel cell, hydraulics, compression, storage, and dispensing components
- Copy of emergency response manuals for compression, storage, and dispensing components

[CPR WILL BE HELD DURING THIS TASK. See Task 1.2 for details]

TASK 5 DEPLOYMENT, BECOMING OPERATIONAL, AND CONTINUING OPERATION

The goal of this task is to make operational and deploy the mobile refueler to provide temporary hydrogen refueling during planned or unplanned maintenance at existing stations, and at vehicle demonstration events. For the mobile refueler, the operational date is defined as the date by which the mobile refueler has a hydrogen fuel supply and all components are installed. Further, the mobile refueler shall have all of the required permits. The mobile refueler shall also have a completed, successful hydrogen quality test (Section IV. A.), shall also have made hydrogen available to fuel one fuel cell vehicle with hydrogen, and shall be ready for deployment.

The Recipient shall:

- Deploy the mobile refueler to sites in Northern or Southern California as directed by the Energy Commission. Deployment will be coordinated through a designated Energy Commission “hotline”. Cost of delivered hydrogen shall be within the range of market conditions, plus a reasonable margin to cover expenses.
- Provide training to the mobile refueler drivers so that they may operate the mobile refueler.
- Keep a log of deployments, including but not limited to destination, amount of fuel delivered, number of vehicles refueled, amount of time at each station.
- Commission and make operational the mobile refueler, test and verify performance of the mobile refueler, complete all qualification testing required by PON-13-607 (Section IV. Minimum Technical Requirements), and provide written notification to the CAM of operability of the mobile refueler (including time and date of operability, performance and qualification tests executed, and test results).
- Conduct hydrogen quality testing of the GTI mobile refueler according to requirements in PON-13-607 Section IV. Subsection A.
- Mobile refueler shall have a minimum daily onboard storage capacity of 45 kilograms. The mobile refueler shall be able to dispense hydrogen from either the on board hydrogen storage or from a station’s storage supplies and fill either 350 bar or 700 bar vehicle tanks or refill a station’s hydrogen storage tanks.
- **Make mobile refueler operational by July 31, 2015.**

Products:

- Quarterly copy of deployment log

- Written notification to the CAM of the mobile refueler's operationality, which will include the results of the first passing hydrogen quality test

TASK 6 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 benefits, and to include the data and analysis in the Final Report. The NREL Data Collection Tool spreadsheets shall be used for data collection.

The Recipient shall:

- Develop a plan for data collection according to the National Renewable Energy Laboratory (NREL) Data Collection Tool.
- Develop a training and outreach activities plan
- Troubleshoot any issues identified.
- Collect 12 months of throughput, usage, and operations data from the use of the mobile refueler, including information about supply sources and dispensing locations
 - 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
- Specific jobs and economic development resulting from this project
 - Identify any current and planned use of renewable energy by the mobile refueler.
 - 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 that complies with the NREL Data Collection Tool spreadsheets for each quarter and submit to the CAM.

- Collect data, information, and analysis described above and include in the Final Report.

Products:

- Quarterly reporting that complies with the NREL Data Collection Tool spreadsheets
- Training and Outreach Report
- Data collection information and analysis will be included in the Final Report

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: INSTITUTE OF GAS TECHNOLOGY dba GAS TECHNOLOGY
INSTITUTE

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-14-003 from PON-13-607 with **Institute of Gas Technology dba Gas Technology Institute** for a **\$999,677** grant to design, fabricate, test, and deploy a fully operational, commercial mobile hydrogen refueler configured on a medium-duty Ford F550 platform with hydrogen storage, compression, and dispensing capabilities. The hydrogen refueling equipment will be self powered by a zero emission on-board hydrogen fuel cell and have the capability to fill either 350 Bar or 700 Bar vehicle tanks through onboard metered dispensing hoses; 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 July 22, 2014.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Harriet Kallemeyn,

Secretariat