

**GRANT REQUEST FORM (GRF)**

CEC-270 (Revised 02/13)

CALIFORNIA ENERGY COMMISSION

New Agreement ARV-13-011 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
600 Fuels and Transportation Division	Larry Rillera	27	916-651-6178

Recipient's Legal Name	Federal ID Number
National Strategies LLC	26-3490284

Title of Project
Electric School Bus with Vehicle-to-Grid and Vehicle-to-Building Functionality

Term and Amount	Start Date	End Date	Amount
	8 / 1 / 2014	3 / 31 / 2017	\$ 1,473,488

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

Proposed Business Meeting Date	7 / 22 / 2014	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Larry Rillera	Time Needed:	5 minutes

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

**Agenda Item Subject and Description**

Possible resolution approving Agreement ARV-13-011 with National Strategies, LLC for a \$1,473,488 grant to conduct a medium-duty electric school bus repower demonstration project.

**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 .
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:  
 the project will not cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment;
- 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
Transpower	\$ 1,221,410
Alliance Consulting Group	\$ 110,989
	\$

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

Legal Company Name:
NRG Energy
EPC Power Corp

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<b>Budget Information</b>			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
ARFVTF	13/14	601.118F	\$1,473,488
Funding Source			\$
R&D Program Area:	Select Program Area	TOTAL:	\$1,473,488
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

<b>Recipient's Administrator/ Officer</b>				<b>Recipient's Project Manager</b>			
Name:	Kevin Matthews			Name:	Kevin Matthews		
Address:	1400 Eye St. NW, Suite 900			Address:	1400 Eye St. NW, Suite 900		
City, State, Zip:	Washington, DC 20005			City, State, Zip:	Washington, DC 20005		
Phone:	202-349-7010	Fax:	202-783-1041	Phone:	202-349-7010	Fax:	202-783-1041
E-Mail:	Kmatthews@nationalstrategies.com			E-Mail:	Kmatthews@nationalstrategies.com		

<b>Selection Process Used</b>	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: PON-13-602
<input type="checkbox"/> First Come First Served Solicitation	

<b>The following items should be attached to this GRF</b>	
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

## Exhibit A SCOPE OF WORK

### TECHNICAL TASK LIST

Task #	CPR	Task Name
1	N/A	Administration
2		Bus Acquisitions
3		Drive System Design
4		Subsystem Integration
5	X	Bus Integration and Check-Out
6		Charging, V2G, and V2B System Development
7		ESB Demonstrations, Data Analysis, and Project Reporting

### KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Participant(s)
1	Kevin Matthews,	NSI, LLC	
2	Stephen Crolius	Alliance Consulting Group	
3	Joshua Goldman, James Burns	TransPower	
4	Joshua Goldman, Frank Falcone	TransPower	EPC Power Corp.
5	Joshua Goldman, Paul Scott	TransPower	
6	Scott Fisher	NRG Energy	PJM Interconnect
7	Scott Sarazen, Jean- Francois Trambly	Ernst & Young	

### GLOSSARY

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

Term/ Acronym	Definition
ARFVTP	Alternative and Renewable Fuel and Vehicle Technology Program
BOM	Bill of Material
CAM	Commission Agreement Manager
CHP	California Highway Patrol
CPR	Critical Project Review
ESB	Electric School Bus
EBCDR	Electric Bus Component Durability Report
Energy Commission	California Energy Commission
ESB- V2G/V2B	Electric School Bus with Vehicle-to-Grid and Vehicle-to-Building Functionality
FTD	Fuels and Transportation Division

<b>Term/ Acronym</b>	<b>Definition</b>
GVWR	Gross Vehicle Weight Rating
Recipient	National Strategies, LLC
V2B	Vehicle-to-Building
V2G	Vehicle-to-Grid

## **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 ARFVTP has an annual budget of approximately \$100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

The statute requires the Energy Commission to adopt and update annually an investment plan to determine funding priorities and opportunities and describe how program funding will be used to complement other public and private investments. The Energy Commission adopted its most recent investment plan on May 08, 2013. A link to the 2013-2014 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program (CEC-600-2012-008-CMF) can be found at <http://www.energy.ca.gov/2012publications/CEC-600-2012-008/CEC-600-2012-008-CMF.pdf>.

On June 13, 2013, the Energy Commission issued Solicitation PON-13-602 entitled "Used Medium-Duty Electric Vehicle Repower Demonstration" under the ARFVT Program. This competitive grant solicitation was an offer to cost-share the development demonstration projects that convert used medium-duty gasoline and diesel vehicles to all-electric drive. Medium-duty vehicles have a Gross Vehicle Weight Rating of 10,001 pounds to 26,000 pounds. To be eligible for funding under PON-13-602, the projects must also be consistent with the Energy Commission's ARFVTP Investment Plan updated annually. In response to PON-13-602, the Recipient submitted application #4 which was proposed for funding in the Energy Commission's Notice of Proposed Awards on October 17, 2013, and is incorporated by reference in this Agreement in its 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 Commission's Award, the 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:**

Electric vehicles are currently in the market for light duty passenger cars. Electric vehicle retrofit solutions for medium-duty vehicles such as school buses face significant challenges in the areas of science and technology, market and environment, and cost. The Electric School Bus (ESB) with Vehicle-to-Grid (V2G) and Vehicle-to-Building (V2B) Functionality (ESB-V2G/V2B) Project addresses issues that impact the development of medium-duty zero-emission vehicles in California.

Public investment into repowering existing vehicles with clean technologies is required to accelerate the market introduction of new, cost-competitive products when compared to traditional internal combustion engine vehicles.

#### **Goals of the Agreement:**

The goals of this Agreement are to:

1. Repower Type C school buses with all-electric, battery-powered, zero-emission systems.
2. Demonstrate that the repowered school buses meet real-world performance, range, and reliability requirements.
3. Provide healthy and sustainable school buses without raising the cost of pupil transportation.

## **Objectives of the Agreement:**

The objectives of this Agreement are to:

1. Perfect the design of the medium-duty school bus variant of TransPower's ElecTruck™ battery-based electric drive system.
2. Integrate subsystems designed and built for the ElecTruck™ system into up to six school buses with a Gross Vehicle Weight Rating (GVWR) of 10,001 pounds to 26,000 pounds.
3. Obtain approval from appropriate agencies, place up to six ESB's into regular service with at least two California school districts, and demonstrate performance and reliability.
4. Integrate V2G and V2B systems and validate that V2G and V2B functions improve the value proposition for ESB's.

## **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 Recipient shall:**

- Attend a "Kick-Off" meeting with the Commission Agreement Manager (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. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting the CAM will provide an agenda to all potential meeting participants.
- The administrative portion of the meeting shall include, but not be limited to, the following:
  - o Discussion of the terms and conditions of the Agreement
  - o Discussion of Critical Project Review (Task 1.2)
  - o Match fund documentation (Task 1.6) No work may be done until this documentation is in place.
  - o Permit documentation (Task 1.7)
  - o Discussion of subcontracts needed to carry out project (Task 1.8)
- The technical portion of the meeting shall include, but not be limited to, the following:
  - o The CAM's expectations for accomplishing tasks described in the Scope of Work
  - o An updated Schedule of Products
  - o Discussion of Progress Reports (Task 1.4)

- o Discussion of Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
- o Discussion of the 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**

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.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. 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 Energy Commission Grants Officer, the Fuels and Transportation Division (FTD), 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 Energy 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.
- 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.

**Recipient 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.
- Prepare Draft Final Report.
- 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.
- 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, and 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.
- 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. 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
    - 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)

### **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 BUS ACQUISITIONS**

The goal of this task is to acquire a minimum of three and up to six diesel-powered school buses with a GVWR between 10,001 pounds and 26,000 pounds that will be repowered with electric-drive systems.

#### **The Recipient shall:**

- Acquire and transport used<sup>1</sup> and currently operational school buses in an appropriate GVWR and class from the Napa Valley Unified School District and Kings Canyon Unified School District (or an appropriate substitute school district approved by the CAM) to the TransPower manufacturing facility in Poway, California.

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<sup>1</sup> A used vehicle is an operating vehicle that has an engine that was manufactured prior to 2010 and is not certified to EPA 2010 emission standards.

- Acquire from a California-based fleet proprietor used and operating, diesel school buses of the same class and model, or another appropriate class and model that still meets the requirements for GVWR and performance, for conveyance and use by the Torrance Unified School District, and transport the buses to the TransPower manufacturing facility in Poway, California.
- Identify each bus according to the sequence of modifications and tracking used in the project.

**Products:**

- Purchase or acquisition agreements for each bus
- Title and goods conveyance
- Photographs of each acquired bus

**TASK 3 DRIVE SYSTEM DESIGN**

The goals of this task are to develop a variant of the design of TransPower’s ElecTruck™ drive system customized for each school bus acquired in Task 2 to allow on-road demonstrations for performance, range, and durability.

**The Recipient shall:**

- Develop concepts and subtasks for packaging ElecTruck™ components into the acquired school buses.
- Modify and document the updated ElecTruck™ design in accordance with the results of the developed concepts and subtasks.

**Products:**

- Updated design package
- Summary of task findings

**TASK 4 SUBSYSTEM INTEGRATION**

The goal of this task is to build and test subsystems that will be installed into each acquired bus.

**The Recipient shall:**

- Procure all materials and equipment required to build, test, and install subsystems.
- Assemble ElecTruck™ subsystems, including motive drive subsystems, inverter-charger subsystems, energy storage subsystems, accessory subsystems, and vehicle control subsystems.
- Perform subsystem and component-level bench-testing to assure proper functionality.
- Store completed subsystems until needed for bus installation.

**Products:**

- Updated ElecTruck™ Bill of Material (BOM)
- Summary of task performance and testing results

**TASK 5 BUS INTEGRATION AND CHECK-OUT****[CPR will be held upon completion of this task per Task 1.2]**

The goal of this task is to install ElecTruck™ drive systems and Task 4 subsystems into the acquired buses.

School buses funded under this demonstration project will provide home to school transportation for school children in the state of California. As such, the project will need to successfully pass a California Highway Patrol (CHP) safety inspection and be issued a valid CHP Form 292 or equivalent successor form for each bus before the field demonstration begins.

**The Recipient shall:**

- Remove engines, transmissions, components from each acquired bus necessary to install new systems.
- Completely install ElecTruck™ subsystems and components on one acquired bus for documentation purposes.
- Identify and document lessons learned during integration of the first bus, and modify drive system packaging and installation procedures as appropriate.
- Prepare a Safety Certification Plan that describes the process to achieve initial and continuous CHP safety certification and the timeline to receive approvals for each bus before the field demonstration begins. The plan shall also describe other applicable certifications that may be required of other appropriate agencies. Provide the CAM with the Safety Certification Plan.
- Complete ElecTruck™ subsystems and components installation into the remaining buses based on lessons learned from first bus.

**Products:**

- Updated ElecTruck™ integration drawings and procedures
- Updated ElecTruck™ BOM
- Summary of task including lessons learned, photographs of engine/component removal and storage, and installation of new systems
- Safety Certification Plan

## **TASK 6 CHARGING, V2G, AND V2B SYSTEM DEVELOPMENT**

**[NOTE: Task 6 shall be funded only with match funding, as identified in Exhibit B budget forms. All information and products identified in this task must be included in the Final Report.]**

The goal of this task is to (1) install the necessary hardware and software technology at the charging station sites to power the buses, (2) enable the buses to utilize ancillary grid service opportunities, (3) collect operational information and data.

### **The Recipient shall:**

- Engineer, procure, and install charging interfaces for the ESB's.
- Integrate the V2G/V2B hardware and software technology into the vehicle systems. Identify use cases for V2G/V2B that does not conflict with bus driving requirements
- Develop V2G/V2B use cases and test the technology against those use cases.

### **Products:**

- Demonstration-level data of overall impact of V2G/V2B on ESB economics and operational performance will be included in the Final Report.

## **TASK 7 ESB DEMONSTRATIONS, DATA ANALYSIS, AND PROJECT REPORTING**

The goals of this task are to: 1) generate performance, range and durability information through ESB on-road demonstrations; 2) provide quarterly data for the duration of the demonstration period; and 3) analyze data collected.

All data, information, and analysis of data shall be included in the Final Report.

### **The Recipient shall:**

- Return repowered and fully operational ESB's to the participating school districts.
- Immediately notify the CAM of the date when the demonstration period for each ESB begins. Recipient shall also immediately notify the CAM of the date when the demonstration period for each ESB ends.
- Provide training to ESB drivers and ESB maintenance personnel.
- Provide on-going technical support to sustain operation of ESB's during the demonstration period.
- Develop a data acquisition and compilation protocol detailing parameters to be tracked, responsibility for tracking, frequency of acquisition, means of data entry, storage, distribution, security, and measures to ensure data integrity.
- Collect performance data and maintenance/service logs for all buses during the demonstration period.

- Provide the CAM with written approval from all appropriate agencies before transporting school children in the ESBs.
- Prepare an Electric Bus Component Durability Report providing data on the reliability and longevity of the installed electric-drive systems.
- Prepare Final Report including data and analysis, specific jobs and economic development resulting from the project, and comparisons of actual performance with expected performance.
- Evaluate the financial case for ESB using Task 7 data.

**Products:**

- Performance and maintenance/service logs
- Verification of written approval to transport school children in the ESBs
- Quarterly reports
- Electric Bus Component Durability Report
- Report on the financial case for ESB's.
- Final Report

STATE OF CALIFORNIA

STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: NATIONAL STRATEGIES LLC

**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-13-011 from PON-13-602 with **National Strategies LLC** for a **\$1,473,488** grant to conduct a medium-duty electric school bus repower demonstration project; 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]

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Harriet Kallemeyn,  
Secretariat