STATE OF CALIFORNIA
CONTRACT REQUESTS FORM (CRF)
CEC-94 (Revised 5/11) CALIFORNIA ENERGY COMMISSION

☒ New Contract ☐ Amendment to Existing Contract: ___________ Amendment Number: ______

<table>
<thead>
<tr>
<th>Division</th>
<th>Contract Manager</th>
<th>MS-</th>
<th>Phone</th>
<th>CM Training Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTD - Unit 6100 - Emerging Fuels &amp; Tech</td>
<td>Rhetta deMesa</td>
<td>43</td>
<td>916-327-1312</td>
<td>6/26/2008</td>
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</tbody>
</table>

Contractor’s Legal Name | Federal ID Number
-------------------------|--------------------|
Concurrent Technologies Corporation | 25-1556708

Title of Project
Vehicle-to-Grid Testing and Demonstration with Department of Defense

Term

<table>
<thead>
<tr>
<th>New/Original Contract</th>
<th>Start Date</th>
<th>End Date</th>
<th>Amount</th>
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<tbody>
<tr>
<td>8/1/2013</td>
<td>3/31/2016</td>
<td>$2,000,000</td>
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Line up the Amendment information as best as possible in the following boxes.

<table>
<thead>
<tr>
<th>Amendment #</th>
<th>End Date (mm/dd/yy)</th>
<th>Amount</th>
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Business Meeting Information
Proposed Business Meeting Date: 6/12/2013 ☐ Consent ☒ Discussion

Business Meeting Presenter: Rhetta deMesa Time Needed: 5 minutes

Agenda Item Subject and Description
CONCURRENT TECHNOLOGIES CORPORATION. Possible approval of Agreement 600-12-014 with Concurrent Technologies Corporation for a $2,000,000 contract to share cost in a large Department of Defense vehicle-to-grid demonstration. The Demonstration will include converting a portion of the non-tactical fleet to electric drive vehicles and will explore vehicle-to-grid revenue generating capabilities. (ARFVT funding) Contact: Rhetta deMesa. (5 minutes)

Business Meeting approval is not required for the following types of contracts: Executive Director’s signature is required in all cases.

☑ Contracts less than $10k (Policy Committee’s signature is also required)
☑ Amendment for a no-cost time extension. Must be first extension, less than one year and original contract less than $100k.
☐ Contracts less than $25k for Expert Witness in Energy Facility licensing cases and amendments.

Purpose of Contract or Purpose of Amendment, if applicable
The purpose of this agreement is to provide funding that will go towards a large vehicle-to-grid (V2G) demonstration being run by the Department of Defense (DOD). For the demonstration, the DOD will convert a portion of their non-tactical fleet to electric drive vehicles and will explore V2G revenue generating capabilities by participating as fully as possible in the California Independent System Operator’s ancillary services markets. The Energy Commission’s funding will be used to procure necessary test materials including electric vehicle batteries and charging infrastructure, perform laboratory research to investigate the impacts of V2G, and develop a preliminary design to facilitate battery second use applications.

California Environmental Quality Act (CEQA) Compliance

1. Is Contract considered a “Project” under CEQA?
   ☐ Yes: skip to question 2  ☒ No: complete the following (PRC 21065 and 14 CCR 15378):
   Explain why contract is not considered a “Project”:
   Contract will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because most of the work is expected to be completed in a laboratory environment.

2. If contract is considered a “Project” under CEQA:
   ☐ a) Contract IS exempt. (Draft NOE required)
      ☐ Statutory Exemption. List PRC and/or CCR section number: 
      ☐ Categorical Exemption. List CCR section number:
      ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)
      Explain why contract is exempt under the above section:

   ☒ b) Contract IS NOT exempt. The Contract Manager needs to consult with the Energy Commission attorney assigned to their division and the Siting Office regarding a possible Initial Study.

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TMP-STD-1823
Concurrent Technologies
**Budgets Information**

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<th>Funding Source</th>
<th>Amount</th>
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<th>Amount</th>
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Reimbursement Contract #:  Federal Agreement

**Contractor’s Administrator/ Officer**

Name: Raymond Shrift
Address: 100 CTC DR
City, State, Zip: JOHNSTOWN, PA 15904-1935
Phone/ Fax: 814-269-2737 / 814-269-2500
E-Mail: shriftr@ctc.com

**Contractor’s Project Manager**

Name: Jim Hlivko
Address: 1225 S CLARK ST STE 500
City, State, Zip: ARLINGTON, VA 22202-4376
Phone/ Fax: /  
E-Mail: Hlivkoj@ctc.com

**Contractor Is**

☑ Private Company (including non-profits)
☐ CA State Agency (including UC and CSU)
☐ Government Entity (i.e. city, county, federal government, air/water/school district, joint power authorities, university from another state)

**Selection Process Used**

☐ Solicitation  Select Type Solicitation #:  # of Bids:  Low Bid? ☐ No ☐ Yes
☐ Non Competitive Bid (Attach CEC 96)
☒ Exempt  Contractor has already been selected by a federal government solicitation per State Contract Manual section 5.80 B.2.D.

**Civil Service Considerations**

☐ Not Applicable (Contract is with a CA State Entity or a membership/co-sponsorship)
☐ Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER)
☒ The Services Contracted:
   ☒ are not available within civil service
   ☒ cannot be performed satisfactorily by civil service employees
   ☒ are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.
☐ The Services are of such an:
   ☒ urgent
   ☒ temporary, or
   ☒ occasional nature
   that the delay to implement under civil service would frustrate their very purpose.

**Justification:**

This project is cost sharing with a larger Department of Defense effort. The contractor was selected by the Department of Defense through a competitive solicitation.

**Payment Method**

☒ A. Reimbursement in arrears based on:
   ☒ Itemized Monthly  ☐ Itemized Quarterly  ☐ Flat Rate  ☐ One-time
☐ B. Advanced Payment
☐ C. Other, explain:
### Retention

1. Is contract subject to retention? [ ] No [x] Yes

   If Yes, Do you plan to release retention prior to contract termination? [ ] No [x] Yes

### Justification of Rates

Rates are consistent with other researchers doing similar research.

### Disabled Veteran Business Enterprise Program (DVBE)

1. [ ] Not Applicable
2. [x] Meets DVBE Requirements  
   DVBE Amount: $60,077.00  
   DVBE %: 3

   [ ] Contractor is Certified DVBE
   [x] Contractor is Subcontracting with a DVBE: TBD

3. [ ] Requesting DVBE Exemption (attach CEC 95)

### Is Contractor a certified Small Business (SB), Micro Business (MB) or DVBE?

[ ] No [x] Yes

If yes, check appropriate box: [ ] SB [ ] MB [x] DVBE

### Is Contractor subcontracting any services?

[ ] No [x] Yes

If yes, give company name and identify if they are a Small Business (SB), Micro Business (MB) and/or DVBE:

To Be Determined [ ] No [ ] SB [ ] MB [x] DVBE

### Miscellaneous Contract Information

1. Will there be Work Authorizations? [x] No [ ] Yes
2. Is the Contractor providing confidential information? [x] No [ ] Yes
3. Is the contractor going to purchase equipment? [x] No [ ] Yes
4. Check frequency of progress reports
   [ ] Monthly  [x] Quarterly
5. Will a final report be required? [ ] No [x] Yes
6. Is the contract, with amendments, longer than a year? If yes, why?  [ ] No [x] Yes

The Department of General Services has agreed to give the Commission blanket authority to execute multi-year contracts to support the Commission’s RD&D Programs.

### The following items should be attached to this CRF

1. Scope of Work, Attach as Exhibit A.  [x] Attached
2. Budget Detail, Attach as Exhibit B.  [x] Attached
3. CEC 96, NCB Request  [x] Attached
4. CEC 30, Survey of Prior Work  [x] Attached
5. CEC 95, DVBE Exemption Request  [x] Attached
6. Draft CEQA Notice of Exemption (NOE)  [x] Attached
7. Resumes  [x] Attached
8. CEC 105, Questionnaire for Identifying Conflicts  [x] Attached

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Contract Manager  Date  Office Manager  Date  Deputy Director  Date

The following signatures are only required when contract approval is delegated to the Executive Office and not approved at a Business Meeting.  
See Business Meeting Information Section.

Presiding Policy Committee  Date  Associate Policy Committee  Date  Executive Director  Date
Exhibit A
SCOPE OF WORK

TASK LIST

<table>
<thead>
<tr>
<th>Task #</th>
<th>CPR</th>
<th>Task Name</th>
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<tbody>
<tr>
<td>1</td>
<td>N/A</td>
<td>Administration</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Procure PEV V2G Test Material</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Procure EV Battery Systems and Developmental V2G Charging Equipment</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>Technical Documents</td>
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<tr>
<td>5</td>
<td></td>
<td>Perform Laboratory Research and Testing</td>
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<tr>
<td>6</td>
<td></td>
<td>Preliminary Design for Second Life Battery Application</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Benefits Analysis and Technology Transfer Activities</td>
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</table>

KEY NAME LIST

<table>
<thead>
<tr>
<th>Task #</th>
<th>Key Personnel</th>
<th>Key Subcontractor(s)</th>
<th>Key Partner(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>James Hlivko</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Brian Wechtenhiser</td>
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<tr>
<td>3</td>
<td>Brian Wechtenhiser</td>
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<td>4</td>
<td>James Hlivko</td>
<td></td>
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<tr>
<td>5</td>
<td>Daniel Lieb</td>
<td>TBD - DVBE</td>
<td>PG&amp;E</td>
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<tr>
<td>6</td>
<td>Mark Becker</td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>James Hlivko</td>
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</tr>
</tbody>
</table>

ACRONYMS/GLOSSARY

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

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>ARFVT</td>
<td>Alternative and Renewable Fuel and Vehicle Technology</td>
</tr>
<tr>
<td>AS</td>
<td>Ancillary Services</td>
</tr>
<tr>
<td>BMS</td>
<td>Battery Management System</td>
</tr>
<tr>
<td>CA</td>
<td>California</td>
</tr>
<tr>
<td>CCM</td>
<td>Commission Contract Manager</td>
</tr>
<tr>
<td>CTC</td>
<td>Concurrent Technologies Corporation</td>
</tr>
<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>PEV</td>
<td>Plug-in Electric Vehicle</td>
</tr>
<tr>
<td>PG&amp;E</td>
<td>Pacific Gas and Electric Company</td>
</tr>
<tr>
<td>RDT&amp;E</td>
<td>Research, Development, Testing, and Evaluation</td>
</tr>
<tr>
<td>RFQ</td>
<td>Request for Quotation</td>
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<tr>
<td>V2G</td>
<td>Vehicle to Grid</td>
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BACKGROUND

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). The statute, subsequently amended by AB 109 (Núñez Chapter 313, Statutes of 2008), authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced
transportation technologies to help attain the state’s climate change policies. 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.

PROBLEM STATEMENT

Widespread adoption of plug-in electric vehicles (PEVs) is an integral component to achieving California’s low-carbon transportation goals; however, the high cost of the vehicles continues to remain one of the primary barriers to increased market penetration. Preliminary analyses of vehicle-to-grid (V2G) technologies indicate that the associated economic benefits will be high; potentially significant enough to offset higher upfront costs of PEVs. Additionally, integration of V2G can provide grid stabilization through aggregated storage and ancillary services (AS). Currently, V2G technologies and integration have not been demonstrated at a sufficient scale to validate the expected economic benefits and encourage fleet and facility operators to consider deploying vehicle to grid applications.

The U.S. Department of Defense (DOD) is launching the largest V2G demonstration nation-wide to date, and the effort to introduce non-tactical electric vehicles has begun and is focused on two major objectives: a) to demonstrate a 100% all-electric, non-tactical fleet at a DOD base; and b) to explore the V2G revenue generating capability of such a fleet by participating as fully as possible in the California Independent System Operator’s (CAISO’s) AS markets, particularly frequency regulation.

GOALS OF THE AGREEMENT

The goals of this agreement are to produce data to support current and future V2G use of PEV batteries and associated technology in California, and to develop a preliminary design for the application of second life PEV batteries as a stationary energy resource for California utilities. This will be done in collaboration with a California utility. As part of this effort, Concurrent Technologies Corporation (CTC) will procure Test Subject Materials (electric vehicle batteries and associated materials) in complement to the DOD research, development, test and evaluation (RDT&E) PEV V2G activities on at least two military installations located in California. CTC will procure Test Subject Materials to perform laboratory research and testing to investigate impacts of V2G use in California; procure developmental V2G battery charging equipment to support laboratory evaluation of V2G battery operation; perform laboratory testing of electric vehicle batteries in a V2G operational scenario in cooperation with a California utility; evaluate laboratory research and field test data on V2G batteries; prepare a draft technical report that includes the analysis of the laboratory and field data on V2G impacts to electric
vehicle batteries; and develop a preliminary design to implement effective second life application of vehicle batteries as a stationary energy resource for California utilities.

FORMAT/REPORTING REQUIREMENTS

Deliverables/Reports

When creating reports, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager (CCM), the latest version of the Consultant Reports Style Manual published on the Energy Commission’s web site:

http://www.energy.ca.gov/contracts/consultant_reports/index.html

Each final deliverable shall be delivered as one original, reproducible, 8 ½” by 11”, camera-ready master in black ink. Illustrations and graphs shall be sized to fit an 8 ½” by 11” page and readable if printed in black and white.

Electronic File Format

The Contractor shall deliver an electronic copy (CD ROM or memory stick or as otherwise specified by the CCM) of the full text in a compatible version of Microsoft Word (.doc).

The following describes the accepted formats of electronic data and documents provided to the Energy Commission as contract deliverables and establishes the computer platforms, operating systems and software versions that will be required to review and approve all software deliverables.

- Data sets shall be in Microsoft (MS) Access or MS Excel file format.
- PC-based text documents shall be in MS Word file format.
- Documents intended for public distribution shall be in PDF file format, with the native file format provided as well.
- Project management documents shall be in MS Project file format.

Software Application Development

If this scope of work includes any software application development, including but not limited to databases, websites, models, or modeling tools, contractor shall utilize the following standard Application Architecture components in compatible versions:

- Microsoft ASP.NET framework (version 3.5 and up) Recommend 4.0
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5
- Visual Studio.NET (version 2008 and up) Recommend 2010
- C# Programming Language with Presentation (UI), Business Object and Data Layers
- SQL (Structured Query Language)
- Microsoft SQL Server 2008, Stored Procedures Recommend 2008 R2
- Microsoft SQL Reporting Services Recommend 2008 R2
- XML (external interfaces)

Any exceptions to the Software Application Development requirements above must be approved in writing by the Energy Commission Information Technology Services Branch.
TASK 1.0 ADMINISTRATION

MEETINGS

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 Contractor shall:
• Attend a “kick-off” meeting with the Commission Contract Manager, the Contracts Officer, and a representative of the Accounting Office. The Contractor shall bring their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the Commission Contract Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Contract Manager will provide an agenda to all potential meeting participants.

The administrative portion of the meeting shall include, but not be limited to, the following:
  • Terms and conditions of the Agreement
  • CPRs (Task 1.2)
  • Permit documentation (Task 1.8)

The technical portion of the meeting shall include, but not be limited to, the following:
  • The Commission Contract Manager’s expectations for accomplishing tasks described in the Scope of Work;
  • An updated Schedule of Deliverables
  • Progress Reports (Task 1.4)
  • Technical Deliverables (Task 1.5)
  • Final Report (Task 1.6)

The Commission Contract Manager shall designate the date and location of this meeting.

Contractor Deliverables:
• An Updated Schedule of Deliverables
• An Updated List of Match Funds
• An Updated List of Permits

Commission Contract Manager Deliverables:
• Final Report Instructions

Task 1.2 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 if it should, are there any modifications that need to be made to the tasks, deliverables, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Contractor. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Contract Manager and as shown in the Technical Task List above and in the Schedule of Deliverables. However, the Commission Contract Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Contractor.
Participants include the Commission Contract Manager and the Contractor, and may include the Commission Contracts Officer, the PIER Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Contract Manager to provide support to the Energy Commission.

The Commission Contract Manager shall:
- Determine the location, date and time of each CPR meeting with the Contractor. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Contractor 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. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not to modify the tasks, schedule, deliverables and budget for the remainder of the Agreement, including not proceeding with one or more tasks.
- Provide the Contractor with a written determination in accordance with the schedule. The written response may include a requirement for the Contractor to revise one or more deliverable(s) that were included in the CPR.

The Contractor 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 deliverables identified in this Scope of Work. Submit these documents to the Commission Contract Manager 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.

Contractor Deliverables:
- CPR Report(s)
- CPR deliverables identified in the Scope of Work

Commission Contract Manager Deliverables:
- Agenda and a List of Expected Participants
- Schedule for Written Determination
- Written Determination

Task 1.3 Final Meeting
The goal of this task is to closeout this Agreement.

The Contractor shall:
- Meet with the Energy Commission 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 Contractor, the Commission Contracts Officer, and the Commission Contract Manager. 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 Commission Contract Manager.
The technical portion of the meeting shall present findings, conclusions, and recommended next steps (if any) for the Agreement. The Commission Contract Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Contract Manager and the Contracts Officer about the following Agreement closeout items:

- What to do with any state-owned equipment (Options)
- Need to file UCC.1 form re: Energy Commission’s interest in patented technology
- Energy Commission’s request for specific “generated” data (not already provided in Agreement deliverables)
- Need to document Contractor’s disclosure of “subject inventions” developed under the Agreement
- “Surviving” Agreement provisions, such as repayment provisions and confidential deliverables
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

**Deliverables:**
- Written documentation of meeting agreements and all pertinent information
- Schedule for completing closeout activities

**REPORTING**

See Exhibit D, Reports/Deliverables/Records.

**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 research objectives of this Agreement.

The Contractor shall:
- Prepare progress reports which summarize all Agreement activities conducted by the Contractor 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 Commission Contract Manager within 10 working days after the end of the reporting period. Attachment A-2, Progress Report Format, provides the recommended specifications.

**Deliverables:**
- Monthly Progress Reports

**Task 1.5 Test Plans, Technical Reports and Interim Deliverables**
The goal of this task is to set forth the general requirements for submitting test plans, technical reports and other interim deliverables, unless described differently in the Technical Tasks. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

[http://www.energy.ca.gov/contracts/pier/contractors/](http://www.energy.ca.gov/contracts/pier/contractors/)
The Contractor shall:
• Unless otherwise directed in this Scope of Work, submit a draft of each deliverable listed in the Technical Tasks to the Commission Contract Manager for review and comment in accordance with the approved Schedule of Deliverables. The Commission Contract Manager will provide written comments back to the Contractor on the draft deliverable within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final deliverable to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final deliverable within 5 working days of receipt. Key elements from this deliverable shall be included in the Final Report for this project.

Task 1.6 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 Commission Contract Manager will review and approve the Final Report. The Final Report must be completed on or before the termination date of the Agreement. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the ARFVTP Final Report Template which can be requested from the Contract Manager.

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

Task 1.6.1 Final Report Outline

The Contractor shall:
• Prepare a draft outline of the Final Report.
• Submit the draft outline of Final Report to the Commission Contract Manager for review and approval. The Commission Contract Manager will provide written comments back to the Contractor on the draft outline within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final outline to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final outline within 5 working days of receipt.

Deliverables:
• Draft Outline of the Final Report
• Final Outline of the Final Report

Task 1.6.2 Final Report

The Contractor shall:
• Prepare the draft Final Report for this Agreement in accordance with the approved outline.
• Submit the draft Final Report to the Commission Contract Manager for review and comment. The Commission Contract Manager will provide written comments within 10 working days of receipt.

Once agreement on the draft Final Report has been reached, the Commission Contract Manager shall forward the electronic version of this report for Energy Commission internal approval. Once the approval is given, the Commission Contract Manager shall provide written approval to the Contractor within 5 working days.
• Submit one bound copy of the Final Report with the final invoice.

**Deliverables:**
• Draft Final Report
• Final Report

**MATCH FUNDS, PERMITS, AND ELECTRONIC FILE FORMAT**

**Task 1.7 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. While the PIER budget for this task will be zero dollars, the Contractor may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds during the term of this Agreement. Match funds must be identified in writing, and the associated commitments obtained before the Contractor can incur any costs for which the Contractor will request reimbursement.

**The Contractor shall:**
• Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
  1. 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.
  2. 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 Contractor shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
     • 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.
• Discuss match funds and the implications to the Agreement if they are significantly 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 Commission Contract Manager if during the course of the Agreement additional match funds are received.
• Notify the Commission Contract Manager within 10 working days if during the course of the Agreement existing match funds are reduced. Reduction in match funds may trigger an additional CPR.

**Deliverables:**
- A letter regarding Match Funds or stating that no Match Funds are provided
- Letter(s) for New Match Funds
- A copy of each Match Fund commitment letter
- Letter that Match Funds were Reduced (if applicable)

**Task 1.8 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. While the PIER budget for this task will be zero dollars, the Contractor shall show match funds for this task. Permits must be identified in writing and obtained before the Contractor can incur any costs related to the use of the permits for which the Contractor will request reimbursement.

**The Contractor shall:**

• Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
  1. If there are no permits required at the start of this Agreement, then state such in the letter.
  2. 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
     • Schedule the Contractor will follow in applying for and obtaining these permits.
• The list of permits and the schedule for obtaining them will be discussed at the kick-off meeting, and a timetable for submitting the updated list, schedule and the copies of the permits will be developed. 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, then provide the appropriate information on each permit and an updated schedule to the Commission Contract Manager.
• As permits are obtained, send a copy of each approved permit to the Commission Contract Manager.
If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Contract Manager within 5 working days. Either of these events may trigger an additional CPR.

Deliverables:
- A letter documenting the Permits or stating that no Permits are required
- Updated list of Permits as they change during the Term of the Agreement
- Updated schedule for acquiring Permits as it changes during the Term of the Agreement
- A copy of each approved Permit

**TECHNICAL TASKS**

**TASK 2--PROCURE PEV V2G TEST MATERIAL**

The goal of this task is to procure Test Material to complement an ongoing DOD Research, Development, Testing, and Evaluation (RDT&E) project to evaluate PEV V2G operations on at least two California military installations. The Test Material will include, at a minimum, the EV battery pack, the vehicle Battery Management System (BMS) and associated cables and connectors for vehicles participating in the DOD RDT&E Project. When the DOD RDT&E Project is completed, the Test Material will be used in a battery second life application as a stationary energy resource for California utilities.

The Contractor shall:

- Review the approximately one hundred identified PEV requirements at the two identified California military installations and categorize types and capacities of the electric vehicle batteries.
- Select up to thirty electric vehicles to participate in the task.
- Prepare and issue a Request for Quotation (RFQ) for the Test Material.
- Evaluate responses to the RFQ.
- Procure up to thirty sets of EV battery systems that include the EV battery packs with the associated vehicle BMS, cables and connectors for the selected vehicles.
- Prepare a Test Material Procurement Report that includes the vendors, quantities, costs, and associated vehicles.

Deliverables:

- RFQ for Test Material
- Draft Test Material Procurement Report
- Final Test Material Procurement Report

**TASK 3--PROCURE EV BATTERY SYSTEMS AND DEVELOPMENTAL V2G CHARGING EQUIPMENT**

The goal of this task is to procure EV battery systems and developmental V2G charging equipment to perform laboratory research to investigate impacts of V2G use on electric vehicle batteries in California. The EV battery systems will include, at a minimum, the EV battery pack,
the BMS, and associated cables and connectors. These EV battery systems are to be procured in addition to the items in Task 2.

The Contractor shall:

- Identify five EV battery systems for use in the laboratory research effort to evaluate V2G impacts on EV battery useful life.
- Prepare and issue a RFQ for the five EV battery systems.
- Evaluate responses to the RFQ.
- Procure the five selected EV battery systems.
- Prepare an EV Battery Systems Procurement Report that includes the vendors, quantities, costs, and associated vehicles.
- Develop a requirements document for the developmental V2G charging equipment.
- Prepare and issue a RFQ for developmental V2G charging equipment.
- Evaluate responses to the RFQ.
- Procure the selected developmental V2G charging equipment.
- Prepare a Charging Equipment Procurement that includes the vendors, quantities, and cost information.

Deliverables:

- RFQ for EV Battery Systems
- Draft EV Battery Systems Procurement Report
- Final EV Battery Systems Procurement Report
- Requirements Document for V2G charging equipment
- RFQ Document for V2G charging equipment
- Draft V2G Charging Equipment Procurement Report
- Final V2G Charging Equipment Procurement Report

TASK 4--TECHNICAL DOCUMENTS

The goal of this task is to develop a Test Plan, Test Procedure, and a Test Report to perform the laboratory test of EV Battery Systems and developmental V2G charging equipment in a V2G operational scenario.

The Contractor shall:

- Participate in a CPR and prepare a CPR report per Task 1.2.
• Prepare a Test Plan that will portray the anticipated operational sequence for the PEV-V2G installations on two identified California military installations. The plan will define the PEV V2G operational scenario to be used during V2G testing and define the protocol for collecting PEV battery data from electric vehicles participating in the DOD RDT&E project to evaluate PEV V2G operations. The analysis requirements will be defined to document any performance degradation during the testing.
• Prepare and submit a Test Procedure Document that identifies procedures to test the performance of the PEV batteries during simulated V2G operation and will provide a quantitative understanding of the capability of the PEV batteries to support V2G operations.
• Prepare a Test Report that documents test results for laboratory testing of EV Battery Systems used in a PEV V2G simulated fast charge and discharge scenario and field test data gathered from the DOD V2G program using the protocol defined in the Test Plan.

Deliverables:

• CPR Report
• Draft Test Plan
• Final Test Plan Draft
• Test Procedure Document
• Final Test Procedure Document
• Draft Test Report
• Final Test Report

TASK 5--PERFORM LABORATORY RESEARCH AND TESTING

The goal of this task is to perform laboratory research and testing of test subject materials to investigate impacts of V2G use in California.

The Contractor shall:

• Perform laboratory research and testing to investigate impacts of V2G use on the useful life of the PEV batteries procured in Task 3.
• Prepare and deliver a Technical Report documenting any technical issues encountered during testing.

Deliverables:

• Draft Technical Report
• Final Technical Report

TASK 6--PRELIMINARY DESIGN FOR SECOND LIFE BATTERY APPLICATION

The goal of this task is to prepare a preliminary design to package PEV second life batteries to enable such batteries to be used as a stationary energy resource for California utilities.

The Contractor shall:
• Develop a Second Life Requirements Document to package the PEV second life batteries for use as a stationary energy resource. The document will address:
  o Electrical interconnection of vehicle battery packs
  o Mechanical mounting and support for the battery packs
  o Cooling requirements for the interconnected battery packs
  o Software control system
  o Safety requirements
• Develop a design concept to meet the requirements identified in the Requirements Document.
• Review the design concept with all appropriate stakeholders.
• Develop a preliminary design addressing stakeholder inputs to package the PEV second life batteries for use as a stationary energy resource.
• Prepare a Design Package Document that will include design requirements and a preliminary design concept.

Deliverables:

• Second Life Requirements Document
• Design Package Document

TASK 7--BENEFITS ANALYSIS AND TECHNOLOGY TRANSFER ACTIVITIES

The goal of this task is to evaluate the overall benefits of the PEV V2G project and make the knowledge gained, experimental results, and lessons learned from the greater PEV V2G demonstration effort available to the Energy Commission.

The Contractor shall:

• Provide information on the benefits of the project. This information will be incorporated into the Final Report to the Energy Commission and should include but not be limited to:
  o Analysis of the performance of the modified PEV battery packs
  o Evaluation of the performance of the PEV V2G
  o Evaluation of PEV second life battery applications
  o Recommendations for PEV V2G deployment in California

• Provide, for informational purposes only, a copy of the Final Report on the DOD funded Plug-in Electric Vehicle Program: RDT&E Program that is submitted to the Department of Defense within 10 days of submission. The report will be redacted so as not to contain confidential information. The contractor does not need to use or follow the Commission Style Manual to create the copy of the Final Report to the Department of Defense.

Deliverables:

• Redacted copy of the Final Report submitted to DOD