New Agreement EPC-16-060 (To be completed by CGL Office)

<table>
<thead>
<tr>
<th>Division</th>
<th>Agreement Manager</th>
<th>MS-Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERDD</td>
<td>Quenby Lum</td>
<td>43-916-327-1492</td>
</tr>
</tbody>
</table>

Recipient’s Legal Name
Motiv Power Systems, Inc.
Federal ID Number 27-1308892

Title of Project
Adaptive Chargers for Delivery Customers Demonstrating California Advances in Charging

<table>
<thead>
<tr>
<th>Term and Amount</th>
<th>Start Date</th>
<th>End Date</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5/22/2017</td>
<td>12/31/2020</td>
<td>$4,529,956</td>
</tr>
</tbody>
</table>

Business Meeting Information
- ARFVTP agreements under $75K delegated to Executive Director.
- Proposed Business Meeting Date: 5/10/2017
- Consent
- Discussion
- Business Meeting Presenter: Quenby Lum
- Time Needed: 5 minutes

Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description
MOTIV POWER SYSTEMS, INC. Proposed resolution approving Agreement EPC-16-060 with Motiv Power Systems, Inc. for a $4,529,956 grant to develop an onboard smart charger solution and an onboard bi-directional charger solution to enable vehicle grid integration options for medium- and heavy-duty fleet vehicles. The technology will be demonstrated using existing zero emissions delivery trucks at four AmeriPride Services locations within disadvantaged communities in Fresno, Bakersfield, Merced, and Stockton. The benefits of the onboard charger solutions include reducing the need for external charge station upgrades, demand charge mitigation, and consideration of electrical grid integration activities.
### 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:
   - ☒ 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:
     CCR Title 14 15301: Existing Facilities. This project consists of the operation of existing medium and heavy duty fleet delivery trucks out of existing facilities belonging to AmeriPride Services, Inc. These facilities house the delivery trucks which are zero emissions electric vehicles. There will be no expansion of use either for the existing facilities or for the existing fleet vehicles beyond their current existing uses.

     CCR Title 14 15303: New Construction or Conversion of Small Structures. This project consists of the installation of small new equipment in existing small structures. A software-only smart charging solution will be installed in the demonstration electric vehicles (existing delivery trucks) to allow for communication with the electric vehicle chargers at the AmeriPride facilities. For the bi-directional chargers, hardware and software will be developed and the finished product will be installed and demonstrated in existing delivery trucks. Both the smart charger and the bi-directional charger are onboard charging solutions that can fit and be installed within a powertrain on existing vehicles. Smart meters will be installed at existing AmeriPride facilities to allow for collection and analysis of each facility's energy consumption.

     CCR Title 14 15306: Information Collection. This project consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in any serious or major disturbances to any environmental resources. Data from the smart meters will be collected and analyzed both before and after installation of the communications software onto the demonstration vehicles. Energy consumption data will be collected and analyzed from the facilities operating the vehicles equipped with the smart chargers and the bi-directional chargers.
b) Agreement IS NOT exempt. (Consult with the legal office to determine next steps.)

Check all that apply

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

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

Legal Company Name:


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

Legal Company Name:

Budget


Budget Information

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Funding Year of Appropriation</th>
<th>Budget List No.</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC</td>
<td>15-16</td>
<td>301.001C</td>
<td>$4,529,956</td>
</tr>
<tr>
<td>R&amp;D Program Area:</td>
<td>ESRO: ETSI</td>
<td>TOTAL</td>
<td>$4,529,956</td>
</tr>
</tbody>
</table>

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #: 

Recipient's Administrator/ Officer

Name: Urvashi Nagrani
Address: 330 Hatch Drive
City, State, Zip: Foster City, CA 94404-1106
Phone: 650-458-4804 / Fax: - -
E-Mail: urvi@motivps.com

Recipient's Project Manager

Name: Jim Castelaz
Address: 330 Hatch Drive
City, State, Zip: Foster City, CA 94404-1106
Phone: 650-458-4804 / Fax: - -
E-Mail: jim@motivps.com

Selection Process Used

☒ Competitive Solicitation
☐ First Come First Served Solicitation

Solicitation #: GFO-16-303

The following items should be attached to this GRF

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

A. Task List

<table>
<thead>
<tr>
<th>Task #</th>
<th>CPR</th>
<th>Task Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>General Project Tasks</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Develop Smart Charging Solution</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Smart Charging Data Collection</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>Develop Bi-Directional Charger</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Smart Charging and Bi-Directional Data Collection</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Collect and Analyze Data and Provide Results</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Evaluation of Project Benefits</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Technology/Knowledge Transfer Activities</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Production Readiness Plan</td>
</tr>
</tbody>
</table>

B. Acronym/Term List

<table>
<thead>
<tr>
<th>Acronym/Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM</td>
<td>Commission Agreement Manager</td>
</tr>
<tr>
<td>CAO</td>
<td>Commission Agreement Officer</td>
</tr>
<tr>
<td>CPR</td>
<td>Critical Project Review</td>
</tr>
<tr>
<td>PRD</td>
<td>Product Requirement Document – critical requirements for a product in design or build.</td>
</tr>
<tr>
<td>BC</td>
<td>Bidirectional Charger</td>
</tr>
<tr>
<td>Motiv Powertrain</td>
<td>The Motiv Powertrain is the hardware power electronics and software controls used to manage power across a vehicle. This includes adaptive power converters, motor controllers, a power control unit, auxiliary controllers, and the charger.</td>
</tr>
<tr>
<td>Charger</td>
<td>The charger is a physical hardware component that allows AC power to be used to charge the vehicle batteries, often while using both hardware and software controls.</td>
</tr>
<tr>
<td>EVSE</td>
<td>The off board Electrical Vehicle Service Equipment. This is commonly referred to as a vehicle charger, however the Motiv charger function is fulfilled by an onboard charger, and the EVSE is the stationary equipment.</td>
</tr>
<tr>
<td>VGI</td>
<td>Vehicle to Grid Integration – all types of grid responsive behavior on a vehicle including smart charging, demand response, providing ancillary services, or stationary storage.</td>
</tr>
<tr>
<td>ECO</td>
<td>Engineering Change Order, a process by which engineers request feature changes</td>
</tr>
<tr>
<td>TAC</td>
<td>Technical Advisory Committee</td>
</tr>
</tbody>
</table>

1 Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.
II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement
Recipient will develop both a smart charging solution and bi-directional charger solution enabling vehicle to grid integration (VGI) and demonstrate the technology with AmeriPride Services. The initial smart charging solution will be demonstrated in Phase 1 in four AmeriPride locations in Fresno, Bakersfield, Merced, and Stockton, all in California. In the Phase 2 the bi-directional charger will be demonstrated on a subset of the fleet in Fresno, California. Each technology solution will have a full year of data collection in which the technology is validated and economic impact is accessed.

B. Problem/Solution Statement

Problem
Utilities are going to be facing a vastly different portfolio of energy supplies in the coming decades as more renewables come online that are time dependent such as solar and wind. Simultaneously fleets will be adopting Zero-Emission Vehicle solutions in place of fossil fuel based fuels, consuming more and more electricity if we are to meet California’s Zero Emissions Vehicle Mandate. While controlled charging and grid integration has the potential to both increase stability of the grid and reduce charging costs for fleets, the technologies needed for such integration are expensive off board solutions that do not make sense for most fleets, resulting in a generation of vehicles being built that will adversely harm the grid if cheaper smart charging and grid-integration solutions aren't developed to ramp up with early adopter growth. This generation of vehicles will have the best case study data and thus be most attractive to new buyers even if they are not good for grid stability. This challenge has not been adequately addressed because development of this technology is being done by private actors limited by costs and risks on market penetration, and regulated utilities are operating on time frames that make them unable to develop and rapidly move solutions to market. Without cheaper solutions for vehicle to grid integration, the potential benefits of a smart grid will be unobtainable.

Solution
Recipient will develop both a software only smart charging solution as well as a bi-directional on board charger solution for vehicles that can be easily purchased as an option on existing vehicles. This solution would fit within a scalable and modular powertrain already used in a variety of vehicle applications, allowing VGI solutions to fit within a plethora of emerging markets and be supplied to vehicle builders from a variety of delivery and work trucks, as well as shuttle and school buses. This allows VGI to fit both within goods movement and freight plans as well as clean transit and zero-emissions bus plans. Furthermore, the software controls will allow updates to reflect new rate structures or demand charges when the utilities have developed such plans, enabling fleets to have a lasting solution.

C. Goals and Objectives of the Agreement

Agreement Goals
The goals of this Agreement are to:

- Provide a Smart Charging (SC) solution for truck builders & fleets using Motiv Powertrains to allow for demand charge mitigation.
Exhibit A
Scope of Work
Motiv Power Systems

- Develop a bi-directional charger (BC) solution that allows fleets to consider grid integration activities.
- Move pre-commercial prototypes into small-scale manufacturing.
- Conduct real world analysis of both economic and operational benefits of VGI technologies.
- Determine the Total Cost of Ownership (TOC) on smart charging solutions.
- Communicate the operational and commercial learnings to allow for successful methodologies to scale across other technology providers working on VGI solutions.

Ratepayer Benefits: This Agreement will result in ratepayer benefits of greater electricity reliability and lower costs by optimizing power usage for vehicles in which the Motiv Smart Charging Solution or Bi-Directional Charger are installed. Demand charges and peak prices of power cause variable prices of operation for fleets, and increase loads at suboptimal times for the grid. By facilitating vehicle’s reduction of energy use during peak consumption intervals, the Motiv chargers will reduce the peaks and allow for ongoing cost savings for grid operators and reduced likelihood of outages. In addition, electric vehicles increase the number of rate payers so fixed utility costs for upgrades would be spread over a wider pool of ratepayers, reducing the cost per ratepayer.

Technological Advancement and Breakthroughs: This Agreement will lead to technological advancements and breakthroughs to overcome barriers in helping to achieve California’s statutory energy goals by moving beyond pilots of light duty vehicles into a segment with limited research: larger battery-electric-vehicles (BEVs), which have significantly higher battery capacity and power needs. This omission can be seen through its absence in a report, “Vehicle – Grid Integration, A Vision for Zero-Emission Transportation Interconnected throughout California’s Electricity System” where the word “trucks” is only used once. Although it is known that a difference exists between the use cases of duty cycles, research in this area is lacking. In the “California Vehicle-Grid Integration (VGI) Roadmap Appendix C: Activities Reference Information,” only one purely electric medium duty vehicle solution is referenced in testing a VGI project on school buses. Also referenced is a research project to develop a Vehicle-to-Grid Energy Module (V2GEM), yet to be commercially available. Even if those projects are successful, nothing has been done in a delivery segment with goods-moving trucks. There have not been public projects with heavy duty vehicles in a revenue generating fleet, a knowledge gap that will be addressed by this project.

2 California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC “Phase 2” Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD/pdf/FINAL_DECISION/167664.PDF).
3 California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state’s statutory and energy goals.
This project will advance the technology in two different models: smart charging solutions vs. a bi-directional charger solution. It will also provide valuable input on the economics of how vehicles used in a fleet will engage within industrial sites. This research will be the first of its kind. Because the charger integrates with a powertrain already in many vehicle applications, ranging from school buses to refuse trucks, the technology transfer will be built-in across applications, accelerating the pathway to market penetration.

Agreement Objectives
The objectives of this Agreement are to:

- Develop a control algorithm to throttle back charging to allow demand charge mitigation.
- Design and prototype a next generation bi-directional onboard charger.
- Demonstrate both charger solutions on a commercially active delivery fleet.
- Make production-level chargers available for sale by the conclusion of the project.
- Develop and implement a Technology/Knowledge Transfer Plan.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products
The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the Project Schedule (Part V). Products that require a draft version are indicated by marking “(draft and final)” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “days” means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report
- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.
Exhibit A
Scope of Work
Motiv Power Systems

For products that require a final version only
• Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products
• Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

  o **Electronic File Format**
    ▪ Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission’s software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

    The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:
    ▪ Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
    ▪ Text documents will be in MS Word file format, version 2007 or later.
    ▪ Documents intended for public distribution will be in PDF file format.
    ▪ The Recipient must also provide the native Microsoft file format.
    ▪ Project management documents will be in Microsoft Project file format, version 2007 or later.

  o **Software Application Development**
Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
    ▪ Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
    ▪ Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
    ▪ C# Programming Language with Presentation (UI), Business Object and Data Layers.
    ▪ SQL (Structured Query Language).
    ▪ XML (external interfaces).

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

MEETINGS
Subtask 1.2 Kick-off Meeting
The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

**The Recipient shall:**

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

  The administrative portion of the meeting will include discussion of the following:
  
  - Terms and conditions of the Agreement;
  - Administrative products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Match fund documentation (subtask 1.7);
  - Permit documentation (subtask 1.8);
  - Subcontracts (subtask 1.9); and
  - Any other relevant topics.

  The technical portion of the meeting will include discussion of the following:
  
  - The CAM’s expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports and invoices (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide an Updated Project Schedule, List of Match Funds, and List of Permits, as needed to reflect any changes in the documents.

**The CAM shall:**

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

**Recipient Products:**

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

**CAM Product:**

- Kick-off Meeting Agenda
Subtask 1.3 Critical Project Review (CPR) Meetings

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

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

The Recipient shall:

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

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient’s input.
- Send the Recipient a CPR Agenda and a List of Expected CPR Participants in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a Schedule for Providing a Progress Determination on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a Progress Determination on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)
CAM Products:
- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting
The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:
- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.
- The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM’s discretion.
  - The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
  - The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
    - Disposition of any state-owned equipment.
    - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission’s interest in patented technology.
    - The Energy Commission’s request for specific “generated” data (not already provided in Agreement products).
    - Need to document the Recipient’s disclosure of “subject inventions” developed under the Agreement.
    - “Surviving” Agreement provisions such as repayment provisions and confidential products.
    - Final invoicing and release of retention.
- Prepare a Final Meeting Agreement Summary that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a Schedule for Completing Agreement Closeout Activities.
- Provide All Draft and Final Written Products on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

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

REPORTS AND INVOICES
Subtask 1.5 Progress Reports and Invoices
The goals of this subtask are: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.
Exhibit A  
Scope of Work  
Motiv Power Systems

The Recipient shall:
- Submit a monthly Progress Report to the CAM. Each progress report must:
  - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly Invoice that follows the instructions in the “Payment of Funds” section of the terms and conditions, including a financial report on Match Fund and in-state expenditures.

Products:
- Progress Reports
- Invoices

Subtask 1.6 Final Report
The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least two months before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

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

Recipient Products:
- Final Report Outline (draft and final)

CAM Product:
- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:
- Prepare a Final Report for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (required)
    - Credits page on the reverse side of cover with legal disclaimer (required)
    - Acknowledgements page (optional)
    - Preface (required)
    - Abstract, keywords, and citation page (required)
Exhibit A
Scope of Work
Motiv Power Systems

- Table of Contents (required, followed by List of Figures and List of Tables, if needed)
- Executive summary (required)
- Body of the report (required)
- References (if applicable)
- Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
- Bibliography (if applicable)
- Appendices (if applicable) (Create a separate volume if very large.)
- Attachments (if applicable)
  - Ensure that the document is written in the third person.
  - Ensure that the Executive Summary is understandable to the lay public.
    - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
    - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
    - If it’s necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
  - Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
  - Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
  - Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the Final Report to the CAM along with Written Responses to Comments on the Draft Final Report.

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

CAM Product:
- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS
Subtask 1.7 Match Funds
The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

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

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

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:
  - A list of the match funds that identifies:
    - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
    - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
    - A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
  - At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
  - Provide a **Supplemental Match Funds Notification Letter** to the CAM of receipt of additional match funds.
  - Provide a **Match Funds Reduction Notification Letter** to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

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

**Subtask 1.8 Permits**

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

The Recipient shall:
- Prepare a **Permit Status Letter** that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
Exhibit A
Scope of Work
Motiv Power Systems

- A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
- The schedule the Recipient will follow in applying for and obtaining the permits.

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

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

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

Subtask 1.9 Subcontracts
The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

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

Products:
- Subcontracts (draft if required by the CAM)

TECHNICAL ADVISORY COMMITTEE
Subtask 1.10 Technical Advisory Committee (TAC)
The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:
• Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  o Technical area expertise;
  o Knowledge of market applications; or
  o Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
• Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
• Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
• Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

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

The Recipient shall:
• Prepare a List of Potential TAC Members that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
• Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
• Prepare a List of TAC Members once all TAC members have committed to serving on the TAC.
• Submit Documentation of TAC Member Commitment (such as Letters of Acceptance) from each TAC member.

Products:
• List of Potential TAC Members
• List of TAC Members
• Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings
The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.
Exhibit A
Scope of Work
Motiv Power Systems

The Recipient shall:
- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a TAC Meeting Schedule that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a TAC Meeting Agenda and TAC Meeting Back-up Materials for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare TAC Meeting Summaries that include any recommended resolutions of major TAC issues.

Products:
- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries
Exhibit A
Scope of Work
Motiv Power Systems

IV. TECHNICAL TASKS

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

TASK 2: DEVELOP SMART CHARGING SOLUTION

The goal of this task is to develop a smart charging solution that, when installed on vehicles, allows the fleet to schedule charging and avoid peak demands.

The Recipient shall:

- Select and purchase Smart Meter which will allow collection and analysis of each facility’s energy consumption (Fresno, Bakersfield, Merced, and Stockton). Provide Receipt for Purchase of Smart Meter to CAM
- Install Smart Meter
  - The smart meter selected above will be installed at four locations identified on the Energy Commission California Environmental Quality Act (CEQA) Notice of Exemption form to be filed with the Office of Planning and Research
  - Provide a Photograph of the Completed Smart Meter Installation at Each Site
  - Information will be collected and analyzed following installation
- Implement Smart Charging Solution
  - Analyze the data collected from the installed Smart Meters
  - Develop the smart charging method that gives simple one-way communications from the fleet to reduce charging during peak power consumption (e.g. a message from the charger to the vehicle control system)
  - Produce a Summary of the Data Analysis Results and Plan for Developing Smart Charging Method
- Deploy Smart Charging Solution in the field
  - Install the designed solution in demonstration vehicles
  - Write a short Description of the Smart Charging Solution that was deployed

Products:

- Receipt for Purchase of Smart Meter
- Photograph of the Completed Smart Meter Installation at Each Site
- Summary of the Data Analysis Results and Plan for Developing Smart Charging Method
- Description of the Smart Charging Solution

TASK 3: SMART CHARGING DATA COLLECTION

The goal of this task is to collect data on power consumption at the facilities which are operating vehicles equipped with the Smart Charging Solution. Data will be analyzed for economic impact and operational characteristics of the charger solution on the vehicles as well as the facility.

The Recipient shall:

- Collect data from facilities operating vehicles equipped with the Smart Charging Solution
  - Collect and analyze energy consumption on an ongoing basis
    - Validate economics
    - Prepare a Summary of Economic Findings for Smart Charging Solution
Exhibit A
Scope of Work
Motiv Power Systems

- Validate operational characteristics
- Prepare a *Summary of Operational Characteristics for Smart Charging Solution*

**Products:**
- Summary of Economic Findings for Smart Charging Solution
- Summary of Operational Characteristics for Smart Charging Solution

**TASK 4: DEVELOP BI-DIRECTIONAL CHARGER**
The goal of this task is to develop a Bi-Directional Charger that facilitates both smart charging and the ability for the vehicle to send power to the facility.

**The Recipient shall:**
- Define Bi-Directional Charger Requirements
  - Develop product requirements for the Bi-Directional Charger based on information from TASK 3 and Recipient’s expertise in medium- and heavy-duty electric vehicles
  - Finalize Product Requirement Document (PRD) for internal use in design
  - Develop a *Summary of Product Requirements*
- Develop Hardware and Software for Bi-Directional Charger
  - Develop hardware for the Bi-Directional Charger based on PRD from above
  - Design new or revise existing components / enclosures to facilitate operation
  - Design and install software based on the PRD to facilitate Bi-Directional Charger operation
  - Manufacture the Bi-Directional Charger
  - Take Photograph of the Bi-Directional Charger
- Perform Testing on the Charger
  - Perform testing to ensure the BC meets the PRD and all applicable standards
  - Write *Summary Test Report and Validation of Software Operation*
- Deploy Bi-Directional Charger on Approximately Four (4) Vehicles at the Facility in Fresno
  - Manufacture Bi-Directional Charger
  - Install the Bi-Directional Charger in approximately four (4) vehicles at the Fresno facility
  - Take Photograph of the Bi-Directional Charger Installed on Each Vehicle
- Prepare a CPR Report and participate in a CPR meeting per task 1.3

**Products:**
- Summary of Product Requirements
- Photograph of the Bi-Directional Charger
- Summary Test Report and Validation of Software Operation
- Photograph of the Bi-Directional Charger Installed on Each Vehicle
- CPR Report

**TASK 5: SMART CHARGING AND BI-DIRECTIONAL DATA COLLECTION**
The goal of this task is to collect data from facilities operating vehicles equipped with both the Smart Charging Solution and the Bi-Directional Charger.

**The Recipient shall:**
- Collect data from facilities operating vehicles equipped with the Smart Charging Solution and the Bi-Directional Charger
Exhibit A
Scope of Work
Motiv Power Systems

- Collect and analyze energy consumption on an ongoing basis
  - Validate economics
  - Prepare a *Summary of Economic Findings for Smart Charging Solution and Bi-Directional Charger*
  - Validate operational characteristics
  - Prepare a *Summary of Operational Characteristics for Smart Charging Solution and Bi-Directional Charger*
- As needed, attend and contribute knowledge to EV Pilot Survey

**Products:**
- Summary of Economic Findings for Smart Charging Solution and Bi-Directional Charger
- Summary of Operational Characteristics for Smart Charging Solution and Bi-Directional Charger

**TASK 6: COLLECT AND ANALYZE DATA AND PROVIDE RESULTS**
The goal of this task is to collect all relevant data and analyze the data to inform the evaluation of project benefits and knowledge transfer activities. This task will be focused on the technical aspects of the project.

**The Recipient shall:**
- Determine what key performance indicators best communicate the impact of the technology and summarize key findings
- Develop a *Summary of Key Performance Indicators*
- Aggregate data from the facility, fleet, and vehicle systems
- Analyze the relationship and impacts of the vehicle system and its energy usage on the facility
- Compare Task 3 and Task 5 solutions from both operational and economic impacts
- Based upon the data, determine areas for future research and questions that need further work to answer
- Develop *Recommendations for Areas of Future Research*

**Products:**
- Summary of Key Performance Indicators
- Recommendations for Areas of Future Research

**TASK 7: EVALUATION OF PROJECT BENEFITS**
The goal of this task is to report the benefits resulting from this project.

**The Recipient shall:**
Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*. 
Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

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

- **For Information/Tools and Other Research Studies:**
  - Outcome of project.
  - Published documents, including date, title, and periodical name.
  - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
  - The number of website downloads.
  - An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
  - An estimate of energy and non-energy benefits.
  - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
  - A discussion of project product downloads from websites, and publications in
Exhibit A
Scope of Work
Motiv Power Systems

- A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.

- Respond to CAM questions regarding responses to the questionnaires.

- Within the first 3 months of the project, create a project survey entry responding to the California Public Utilities Commission’s “Electric Vehicle Pilot Survey” related to Proceeding R.13-11-007, “Alternative Fueled Vehicles Rulemaking” (2013). The survey entry should contain the most complete project information available.
  - Resources for completing the Electric Vehicle Pilot Survey can be found at the following links:
    - http://www.energy.ca.gov/research/notices/2015-12-14_workshop/presentations/05a_CPUC_Electric_Vehicle_Pilot_Survey-Read_Me.docx
    - http://www.energy.ca.gov/research/notices/2015-12-14_workshop/presentations/

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

**Products:**
- Electric Vehicle Pilot Survey Response
- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

**TASK 8: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES**

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

**The Recipient shall:**
- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project’s conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
  - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
  - A description of the intended use(s) for and users of the project results.
  - Published documents, including date, title, and periodical name.
  - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
  - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
Exhibit A
Scope of Work
Motiv Power Systems

- The number of website downloads or public requests for project results.
- Additional areas as determined by the CAM.

- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop Presentation Materials for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- Provide at least (6) six High Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a Technology/Knowledge Transfer Report on technology transfer activities conducted during the project.

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

TASK 9: PRODUCTION READINESS PLAN
The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project’s results.

The Recipient shall:
- Prepare a Production Readiness Plan. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
  - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
  - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include “proof of production processes.”
  - The estimated cost of production.
  - The expected investment threshold needed to launch the commercial product.
  - An implementation plan to ramp up to full production.
  - The outcome of product development efforts, such as copyrights and license agreements.
  - Patent numbers and applications, along with dates and brief descriptions.
  - Other areas as determined by the CAM.

Products:
Exhibit A
Scope of Work
Motiv Power Systems

• Production Readiness Plan (draft and final)

V. PROJECT SCHEDULE

Please see Exhibit A Attachment A-1 Excel spreadsheet.
RESOLUTION NO: 17-0510-15d

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: MOTIV POWER SYSTEMS, INC.

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

RESOLVED, that the Energy Commission approves Agreement EPC-16-060 from GFO-16-303 with Motiv Power Systems, Inc. for a $4,529,956 grant to develop an onboard smart charger solution and an onboard bi-directional charger solution to enable vehicle grid integration options for medium- and heavy-duty fleet vehicles. The technology will be demonstrated using existing zero emissions delivery trucks at four AmeriPride Services locations within disadvantaged communities in Fresno, Bakersfield, Merced, and Stockton. The benefits of the onboard charger solutions include reducing the need for external charge station upgrades, demand charge mitigation, and consideration of electrical grid integration activities; 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 May 10, 2017.

AYE: [List of Commissioners]
NAY: [List of Commissioners]
ABSENT: [List of Commissioners]
ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat