



STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

A) New Agreement # EPC-21-010 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Ben Wender	43	916-776-0823

C) Recipient's Legal Name	Federal ID Number
Electric Power Research Institute, Inc.	23-7175375

D) Title of Project
Electric Truck Research and Utilization Center (eTRUC) for RHETTA

E) Term and Amount

Start Date	End Date	Amount
11/1/2021	3/31/2026	\$ 12,999,155

F) Business Meeting Information

☐ ARFVTP agreements \$75K and under delegated to Executive Director

Proposed Business Meeting Date 10/13/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Ben Wender Time Needed: 5 minutes

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

Agenda Item Subject and Description:**Electric Power Research Institute, Inc.**

Proposed resolution approving agreement EPC-21-010 with Electric Power Research Institute, Inc. (with major subcontractor CALSTART, INC.) for a \$12,999,155 grant to fund applied research and development and technology demonstration and deployment activities through creation of a research hub focused on electric heavy-duty drayage trucks and adopting staff's recommendations that this project is exempt from CEQA. The research hub will advance high power charging technologies and engage a broad network of stakeholders and communities to deploy public access charging infrastructure for medium- and heavy-duty vehicles in a heavily-trafficked freight corridor. (EPIC funding) Contact: Ben Wender.

G) 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":

2. If Agreement is considered a "Project" under CEQA:

a) ☒ Agreement **IS** exempt.

☐ Statutory Exemption. List PRC and/or CCR section number:

☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14, § 15301 ; Cal. Code Regs., tit. 14, § 15306

☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

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Explain reason why Agreement is exempt under the above section: Cal. Code Regs., tit. 14, Section 15301 provides that projects which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public and private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of use beyond that existing at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act. The physical aspects of this work will involve the procurement, installation, and operation of high-power charging equipment and distributed energy resources (DER) at an existing truck stop and warehouse facility, both of which are heavily trafficked by heavy-duty trucks serving ports and distribution centers. There will be minor construction activities including boring through existing concrete and electrical interconnection, and no physical expansions will take place. In addition, electrical and equipment upgrades will be made at existing laboratory facilities in California for research and development of high-power charging equipment and DER. Finally, site surveys of existing truck service facilities at numerous locations in Southern California will be made. For these reasons, the proposed work will not have any significant effect on the environment and is exempt under Cal. Code Regs., tit 14, Section 15301.

Cal. Code Regs., tit. 14 Section 15306 provides that projects which consist of basic data collection, research, experimental management, and resource evaluation activities, and which do not result in a serious or major disturbance to an environmental resource are categorically exempt from the provisions of the California Environmental Quality Act. In this project, data and information will be collected on existing heavy-duty truck operations, fueling behavior, and utilization and performance of installed high power chargers as an alternative to fossil fueled trucks. The data collected will inform planning and strategic deployment of future public access charging facilities for large weight class electric vehicles along key freight corridors. For these reasons, the proposed work will not have any significant effect on the environment and is exempt under Cal. Code Regs., tit 14, Section 15306.

- 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

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

Legal Company Name:	Budget
CALSTART, INC.	\$ 2,465,000



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Legal Company Name:	Budget
GRID Alternatives	\$ 450,000
Lawrence Berkeley National Laboratory	\$ 320,000
Cambridge Systematics, Inc.	\$ 578,000
Southern California Association of Governments	\$ (339,925 match only)
ORBCOMM Inc.	\$ 693,738
PAUL INETERNATIONAL, INC.	\$ 99,700
The Regents of the University of California, on behalf of the Riverside Campus	\$ 250,000
Build Momentum (d.b.a. Momentum)	\$ 400,000 (\$100,000 match)
Gladstein, Neandross & Associates LLC	\$ 600,048

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

Legal Company Name:

J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	19-20	301.001G	\$12,999,155
			\$
			\$
			\$
			\$
			\$

R&D Program Area: EGRO: Transportation

TOTAL: \$ 12,999,155

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information**1. Recipient's Administrator/Officer**

Name: Andra Rogers

Address: 3420 Hillview Ave

City, State, Zip: Palo Alto, CA
94304-1355

Phone: 650-855-2101

E-Mail: arogers@epri.com

2. Recipient's Project Manager

Name: Andra Rogers

Address: 3420 Hillview Ave

City, State, Zip: Palo Alto, CA
94304-1355

Phone: 650-855-2101

E-Mail: arogers@epri.com



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L) Selection Process Used

- ☒ Competitive Solicitation Solicitation #: GFO-20-306
- ☐ First Come First Served Solicitation Solicitation #:
- ☐ Non-Competitive Bid Follow-on Funding (SB 115)

M) The following items should be attached to this GRF

- | | |
|---|--|
| 1. Exhibit A, Scope of Work | <input checked="" type="checkbox"/> Attached |
| 2. Exhibit B, Budget Detail | <input checked="" type="checkbox"/> Attached |
| 3. CEC 105, Questionnaire for Identifying Conflicts | <input checked="" type="checkbox"/> Attached |
| 4. Recipient Resolution <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Attached |
| 5. CEQA Documentation <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> Attached |

_____	_____
Agreement Manager	Date
_____	_____
Office Manager	Date
_____	_____
Deputy Director	Date

Prime Recipient: Electric Power Research Institute, Inc.

Project Title: Electric Truck Research and Utilization Center (eTRUC) for RHETTA

Subcontractor or Vendor Company Name	Budget
TBD - Measurement and verification	\$98,650
TBD - System integration	\$53,500
TBD - Monitor installation	\$5,000
TBD - Power electronics advisory	\$80,000
TBD - Website development	\$80,000
Burns & McDonnell Engineering Company, Inc.	(\$199,625 match only)
U.S. Department of Energy, National Renewable Energy Laboratory	(\$250,000 match only)
Southern California Edison Company	(\$300,000 match only)
TBD - Data modeling and trip support	(\$109,979 match only)
TBD - Engineering	(\$119,997 match only)
TBD - Outreach	(\$67,368 match only)

EXHIBIT A

Scope of Work

Electric Power Research Institute

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Community Engagement and Workforce Development
3		Fleet Needs and Technology Maturity Assessment
4	X	Advanced High-Power Charger System R&D
5	X	Phase 1 Pilot Deployment, Evaluation, and Data Reporting
6		Plan for Phase 2 Public Corridor Network
7		Knowledge Transfer & Guidebook
8	X	Phase 1 Review and Phase 2 Proposal
9		Evaluation of Project Benefits
10		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
BEV	Battery Electric Vehicle
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CBO	Community Based Organizations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO ₂ eq	Carbon Dioxide Equivalent
CPR	Critical Project Review
CTAC	Community First Technology Advisory Committee
DER	Distributed Energy Resource
EPRI	Electric Power Research Institute (Applicant)
EPC	Engineering, Procurement, and Construction
GHG	Greenhouse Gas
HD	Heavy Duty
IOU	Investor-Owned Utility
ITAC	Industry Technology Advisory Committee
kg	Kilogram
kW	Kilowatt
kWh	Kilowatt-hour
MD	Medium Duty
mi	Mile
MS	Microsoft
MCS	Megawatt Charging System

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.

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Acronym/Term	Meaning
MDHD	Medium Duty and Heavy Duty
NOx	Nitrogen Oxides
OEMs	Original Equipment Manufacturers
R&D	Research & Development
RTDS	Real-Time Digital Simulations
SCE	Southern California Edison
TAC	Technical Advisory Committee
VGI	Vehicle Grid Integration
WDAC	Workforce Development Advisory Committee
ZE	Zero Emission
ZEV	Zero Emission Vehicle

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to fund applied research and development and technology demonstration and deployment activities through the Research Hub for Electric Technologies in Truck Applications project. The research hub will engage broad stakeholders including but not limited to pollution burdened and impacted communities, truck fleets, charging equipment and service providers, electric utilities, and planning agencies; investigate higher efficiency and higher power density charging components and systems; and assess the opportunities for standardization for high power public charging systems. This project will help to plan, design, and deploy innovative public corridor charging strategies that extend the delivery range and increase the operational flexibility of large weight class battery electric trucks beginning with drayage operations.

B. Problem/ Solution Statement

Problem

The transportation sector is the largest source of greenhouse gas (GHG) emissions in California and a major contributor to criteria pollutant emissions. Heavy-duty (HD) vehicles account for nearly 10 percent of the state's GHG emissions and 26 percent of nitrogen oxides (NOx). HD on-road trucks serving ports, referred to as drayage trucks, are the primary contributor of port-related emissions, representing 40 percent of total port-related GHG emissions and more than 20 percent of NOx emissions in the South Coast Air Basin. Adoption of zero-emission (ZE) alternatives may greatly improve regional air quality, reduce health impacts on nearby communities, and reduce GHG emissions. However, drayage fleets beginning to adopt battery-electric vehicles (BEVs) face challenges related to understanding the performance and flexibility of BEV drayage trucks to meet their operational needs, and to installing necessary charging infrastructure in locations with limited physical space and electrical capacity. Fleets and community needs are not well connected with truck and infrastructure manufacturers and utilities. Barriers include lack of high-power charging equipment at public sites which would extend the range of the HD electric trucks in heavily trafficked regions. Finally, there is a lack of open access local research and testing resources or centers for coordinated development and evaluation of equipment performance.

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Solution

A California research hub that facilitates and accelerates the transformative electrification of California's heavy-duty vehicle market is critical to catalyze the industry. The hub will establish several advisory committees to improve coordination between broad group of stakeholders and inform research activities including planning, developing, testing, and validating high power charging components and systems and providing public charging for HD vehicles in key freight corridors. The Community First Technology Advisory Committee (CTAC) will engage the communities, fleets, non-profits, and governments to inform the project activities and ensure consistent community engagement throughout the project. The Workforce Development Advisory Committee (WDAC) composed of relevant representatives from industry, government, non-profit organizations, academia, community-based organizations (CBOs) will develop a workforce development plan. The Industry Technology Advisory Committee (ITAC) will include original equipment manufacturers (OEMs), utilities, academia, fleet managers, and infrastructure providers and will guide the overall technology development tasks to test and validate feasibility of high-power charging technology in a virtual and physical laboratory setting and eventually demonstrate some of these technologies in a real-world setting. A Technical Advisory Committee (TAC) composed of chairs and co-chairs of each of the other project advisory committees (i.e., CTAC, WDAC, and ITAC) as well as invited outside industry advisors, government agency representatives (including state, local and federal), and other key stakeholders will provide guidance and recommendations on the overall project goals and objectives.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to: 1) leverage industry, community, regulatory, and stakeholder engagement to advance medium- and heavy-duty (MDHD) BEV technologies and infrastructure availability to reduce GHG and criteria pollutant emissions in and around freight facilities and corridors, providing economic, environmental, and public health benefits to disadvantaged and low-income communities; 2) assess freight routes and operational conditions for which MDHD battery electric trucks need access to public charging infrastructure; 3) develop and deploy new high-powered (1MW+) charger prototype(s) that reduce MDHD vehicle charging time, increase charging system efficiency, reduce hardware costs, enable interoperability, and support grid-friendly and resilient corridor charging; 4) accelerate electrification of drayage trucks by conducting an initial pilot deployment of public charging infrastructure using distributed energy resource (DER) and vehicle-grid integration (VGI) technologies; 5) inform future infrastructure deployments that meet near-term fleet needs while supporting long-term electrification targets; 6) develop and disseminate project learnings and best practices for deployment of public corridor MDHD charging infrastructure to accelerate future deployments; and 7) deploy additional public charging sites and advanced charging technologies in key freight corridors based on stakeholder engagement and early project learnings.

Ratepayer Benefits:² This Agreement will result in the ratepayer benefits of: 1) greater electricity

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,

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reliability through the integration of DER resources to support new electricity demand from charging MDHD BEVs; 2) lower overall charging costs through the development of high-capacity chargers with higher efficiency and energy management capabilities; and 3) increased safety through the assessment, refinement, and validation of standards to support safe implementation of on-site DERs, energy management, and high power charging.

Technological Advancement and Breakthroughs: This Agreement seeks to overcome barriers to the achievement of the State of California's statutory energy goals by developing and demonstrating MW level charging equipment both in laboratory settings and at public access stations for MDHD BEVs. MW level charging components and systems including electric vehicle supply equipment (EVSE), site distribution hardware, behind the meter energy storage and other DER, and energy management and control systems will be assessed and characterized to help advance the technology readiness level of these technologies. The project will simultaneously engage a diverse and far-reaching group of stakeholders across the freight and goods movement industry, fleets, ports, planning organizations, pollution burdened communities, CBOs, utilities, academia, OEMs, infrastructure developers, and solutions providers. The project will provide consistent engagement to guide technology development and demonstration activities to meet community needs and support the businesses that rely on them.

Agreement Objectives

The objectives of this Agreement are to:

- Engage diverse stakeholders and advisory committees to gather input on project activities including laboratory testing and pilot demonstration of emerging high power charging technologies that can accelerate adoption of BEV drayage trucks.
- Inform regional and statewide MDHD BEV infrastructure planning and expansion by producing and broadly disseminating resources including guidance for future public high power charging infrastructure installations, assessments of technology maturity, and summaries of freight traffic corridors in the state.
- Develop, design, test, integrate, and validate emerging high-power charging equipment and standards capable of providing 100+ miles of MDHD BEV range in a single 10-min charging session.
- Deploy MW-scale charging systems at two demonstration sites serving priority populations supported by DER and advanced energy management solutions to improve financial, environmental, and resiliency benefits of charging infrastructure deployments.
- Collect and analyze a minimum of 12 months of data for all deployed charging systems and DERs.
- Establish a scalable BEV workforce strategy.
- Develop a scalable, replicable statewide approach to corridor electrification including identification of priority sites for future development, financing partners, and industry partners.

III. TASK 1 GENERAL PROJECT TASKS

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).

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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)**. All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations. All technical tasks should include product(s). 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.

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:

- **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 California Energy Commission’s (CEC) 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.

The following describes the accepted formats for electronic data and documents provided to the CEC 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.

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- Text documents will be in MS Word file format, version 2007 or later.
- Project management documents will be in Microsoft Project file format, version 2007 or later.
- **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.
 - 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 Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the CEC'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 CEC 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;
- Invoicing and auditing procedures;
- 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.

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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 (subtask 1.5);
- Final Report (subtask 1.6);
- Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
- Any other relevant topics.
- Provide *Kick-off Meeting Presentation* to include but not limited to:
 - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
 - Project schedule that identifies milestones
 - List of potential risk factors and hurdles, and mitigation strategy
- Provide an *Updated Project Schedule*, *Match Funds Status Letter*, and *Permit Status Letter*, 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:

- Kick-off Meeting Presentation
- Updated Project Schedule (*if applicable*)
- Match Funds Status Letter (subtask 1.7) (*if applicable*)
- Permit Status Letter (subtask 1.8) (*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 CEC 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 CEC 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 CEC.

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 CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

In addition to conventional CPRs, the Recipient must participate in a CPR Towards Phase 2 meeting to determine if the project should continue and receive Phase 2 funding. The CPR

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Towards Phase 2 meeting will evaluate Phase 1 project progress and plans for continued Phase 2 work. The CPR Towards Phase 2 meeting shall be conducted after the project has met the following Phase 1 milestones:

- The prototype advanced high-power charging system must be developed, built, and operational. Performance metrics validated under relevant laboratory or real-world conditions must be collected and reported to the CAM.
- The Phase 1 initial corridor charging site(s) must be deployed and operational. At the minimum, 6 months of performance data from the initial corridor charging site(s) must be collected and reported to the CAM.
- A draft of the Plan for Phase 2 must be submitted to the CAM that details the Phase 2 site selection and design, including anticipated utilization, site layouts, and equipment specifications for chargers and distributed energy resources.
- The CEQA Compliance Form (Attachment 8) must be submitted to the CAM for each of the Phase 2 site(s) selected. Also, the Recipient must provide the CAM with CEQA documentation from the Lead Agency (or Lead Agencies, if more than one site). The CAM may request the Recipient to provide additional CEQA documentation (as may be available).
- Site commitment letters signed by authorized representatives of the proposed Phase 2 deployment sites must be provided to the CAM.
- Match funding commitment letters signed by authorized representatives of each entity or individual that is committing to providing match funding must be provided to the CAM pursuant of the minimum 50% match funding requirement for Phase 2.

The Recipient shall:

- Prepare and submit 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.
- Prepare and submit a *Phase 1 Interim Report* for the CPR Towards Phase 2 meeting that: (1) summarizes project progress made to date on Phase 1 technical tasks, including challenges, successes, key findings, estimated benefits, performance metrics, and technology and knowledge transfer activities; (2) includes a detailed plan for Phase 2 work that will build off Phase 1 progress and further contribute to electrifying a major freight corridor including proposed site(s); (3) provide an update and further documentation regarding environmental review of the proposed site(s), including CEQA Compliance Forms (Attachment 8) for each site, and CEQA documentation prepared by the CEQA Lead Agency or Lead Agencies.
- 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* with 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

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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. The Progress Determination for the CPR Towards Phase 2 meeting may be divided into two parts, the second part of which would be provided only after Energy Commission approval of Phase 2, if that occurs.
- After the CPR Towards Phase 2 meeting, determine whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. Should the Recipient fail to meet the Phase 1 milestones, exhibit severe performance issues, or fail to adequately address comments received from the CPR Towards Phase 2 meeting, these factors would play a role in whether or not the Commission approves Phase 2 funding. The CEC reserves the right to not approve Phase 2 funds, for these or other reasons, including, but not limited to, funding availability.
- Indicate whether the Recipient must revise one or more products.

Recipient Products:

- CPR Report(s)
- Phase 1 Interim Report

CAM Products:

- CPR Agenda
- Progress Determinations

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with CEC 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 procured equipment.
 - The CEC'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.

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- 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 copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Final Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (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.

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 Funds 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. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC 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 *Energy Commission Style Manual* provided by the CAM.

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Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Energy Commission 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, Energy Commission 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**)
 - 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)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
 - Comments the recipient proposes to incorporate.
 - Comments the recipient does propose to incorporate and an explanation for why.
- 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.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:

- Summary of TAC Comments
- Draft Final Report

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- Written Responses to Comments (*if applicable*)
- 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 CEC 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 CEC 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 CEC 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.
 - If different from the solicitation application, provide 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:

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- 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:
 - 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

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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 each 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:
 - Technical area expertise;
 - Knowledge of market applications; or
 - 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.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

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);

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- 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.

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.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its

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statement of proposed objectives as the project evolves.

- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments on proposed project performance metrics.
- Review and provide comments on proposed project Draft Technology Transfer Plan.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Subtask 1.12 Project Performance Metrics

The goal of this subtask is to identify key performance targets for the project. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the draft *Project Performance Metrics Questionnaire* to the CAM prior to the Kick-off Meeting.
- Present the draft *Project Performance Metrics Questionnaire* at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
 - TAC comments the recipient proposes to incorporate into the final *Project Performance Metrics Questionnaire*.
 - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit a final *Project Performance Metrics Questionnaire* with incorporated TAC feedback.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the recipient met each of the performance metrics in the final *Project Performance Metrics Questionnaire*.
- Discuss the final *Project Performance Metrics Questionnaire* and *Project Performance Metrics Results* at the Final Meeting.

Products:

- Project Performance Metrics Questionnaire (draft and final)

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- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2 COMMUNITY ENGAGEMENT AND WORKFORCE DEVELOPMENT

The goals of this task are to establish and regularly convene a community first advisory committee to inform the project, engage diverse and representative stakeholder and community groups to disseminate and solicit input on project activities, and use input to promote equity and workforce development opportunities in priority communities.

The Recipient shall:

Subtask 2.1 Establish a Community First Advisory Committee and Develop an Equity Plan

- Establish a Community First Technology Advisory Committee (CTAC) composed of relevant experts from government, non-profits, academia, community-based organizations (CBOs), and other organizations recommended by the CAM. The CTAC will meet on a quarterly basis and provide publicly available meeting minutes.
 - Develop a concise statement of goals for the CTAC, list of members, expectations for members, anticipated meeting schedule, and description of how CTAC input will inform project activities (e.g., freight industry and small fleet engagement, future site prioritization).
- Work with the CTAC to develop a *Community Engagement Strategy and Equity Plan* (draft and final) based on a review of existing resources and stakeholder feedback, that includes but is not limited to:
 - Proposed community engagement strategy and implementation timeline.
 - Identification of relevant existing equity metrics.
 - Description of anticipated outcomes from community engagement.
 - Discussion of scalability and replicability.
 - Proposed equity and engagement evaluation criteria that may include but are not limited to:
 - Number of community outreach activities and number of participants.
 - Community participation in site selection for infrastructure projects along corridors and freight hubs.
 - Number of BEV trucks operating in or serving pollution burdened communities and number of diesel truck trips replaced.
 - Emissions reductions in pollution burdened communities.

Products:

- Community Engagement Strategy and Equity Plan (draft and final)

Subtask 2.2 Implement and Document Community Engagement Throughout Project

- Convene in-person and/or virtual CTAC meetings quarterly to present project progress, solicit feedback, evaluate opportunities for improvement, and document community input received and how it can be integrated into project activities.
- Implement the *Community Engagement Strategy and Equity Plan* and continually document (e.g., in progress reports and project website updates) how specific project

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activities will include community and stakeholder input.

- Develop and disseminate multi-lingual and culturally appropriate resources and *Community Outreach Collateral* to inform communities and other stakeholders of project goals, objectives, intended benefits, and opportunities to share input.
- Prepare *CTAC Meeting Summaries* (for each meeting) including but not limited to the meeting time and location, participant list, agenda, summary of discussion topics and findings, any relevant handouts or backup material, meeting outcomes, and remaining action items.
- Identify unique opportunities and challenges specific to regions outside of Phase 1 and elaborate their implications for future projects including potential Phase 2 deployments.
- Prepare a *Community Engagement and Equity Report* (draft and final) providing an overview of the community engagement activities conducted, feedback received, lessons learned, discussion of how community engagement informed project execution, and recommendations for future projects including potential Phase 2 deployments.

Products:

- Community Outreach Collateral
- CTAC Meeting Summaries (for each meeting)
- Community Engagement and Equity Implementation Report (draft and final)

Subtask 2.3 Establish a Workforce Development Advisory Committee and Develop a Workforce Plan

- Create a Workforce Development Advisory Committee (WDAC) composed of relevant representatives from industry, government, non-profit organizations, academia, CBOs, and other organizations based upon input from the CAM. The WDAC will meet quarterly and provide publicly available meeting summaries.
 - Develop a concise statement of goals for the WDAC, list of members, expectations for members, anticipated meeting schedule, and description of how WDAC will inform project activities.
- Work with the WDAC to develop a *Workforce Development Plan* (draft and final) based on a review of existing workforce development resources related to ZE transportation and other stakeholder feedback, which includes but is not limited to:
 - Identification of existing and anticipated workforce development needs and industry barriers.
 - Identification of opportunities for workforce development and education across different MDHD segments.
 - Proposed workforce development strategy and timeline for the project.
 - Description of planned partnerships with:
 - Educational institutions such as community colleges, universities, high schools, and other workforce development programs to support MDHD ZE transportation training in Southern California and statewide.
 - MDHD ZEV OEMs and suppliers to leverage training modules and programs for workforce development.
 - Workforce recruitment organizations to support workforce training, recruitment, and job placement.
 - Development of new training materials that improve upon existing resources related to MDHD ZEV transportation workforce development.

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- Identification and implementation of best practices for engaging local communities and increasing participation in workforce development activities.
- Development of outreach strategies to support broader workforce development network and capacity building.
- Proposed workforce development evaluation criteria that may include but are not limited to:
 - Number of workforce development events and number of participants.
 - Number and types of new training materials.
 - New employment opportunities and placements.
 - Number of jobs spurred through project (manufacturing, engineering, construction, maintenance, etc.).

Products:

- Workforce Development Plan (draft and final)

Subtask 2.4 Implement and Document Workforce Development Throughout Project

- Convene in-person and/or virtual WDAC meetings quarterly to discuss project progress, solicit feedback, evaluate opportunities to expand partnerships and workforce development, and document feedback received and how it was incorporated into project activities.
- Implement the *Workforce Development Plan* and continually document (e.g., in progress reports and project website updates) activities completed, how they informed project execution, and next steps for expanding workforce development activities.
- Develop multi-lingual and culturally appropriate *Workforce Development Collateral* to recruit diverse participants in workforce development activities.
- Develop *WDAC Meeting Summaries* for each meeting, including but not limited to: the meeting time and location, participant list, agenda, summary of discussion topics and findings, relevant handouts or presentations, meeting outcomes, and remaining action items.
- Identify successes and best practices from this project and describe how these can be applied in different regions in future projects including potential Phase II deployments.
- Prepare *Workforce Development Report* (draft and final) providing an overview of workforce development activities conducted, feedback received, templates for easy replication, community and economic development benefits, and discussion of how workforce development activities impacted program design and implementation.

Products

- Workforce Development Collateral
- WDAC Meeting Summaries (for each meeting)
- Workforce Development Report (draft and final)

TASK 3 FLEET NEEDS AND TECHNOLOGY MATURITY ASSESSMENT

The goals of this task are to engage MDHD BEV operators, drayage fleet stakeholders, charging equipment and service providers, utilities, and other stakeholders to access data, collect detailed information on fleet operational needs, and assess the market status of BEV drayage trucks, high-power charging equipment, and supporting infrastructure.

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The Recipient shall:

Subtask 3.1 Establish an Industry Technology Advisory Committee and Develop Fleet Needs and Technology Assessment Framework

- Create an Industry Technology Advisory Committee (ITAC) composed of relevant representatives of MDHD fleet operators, charging equipment and service providers, MDHD truck manufacturers, load serving entities, port and warehouse operators, and other relevant stakeholders based on input from the CAM and broadly disseminated calls for participation.
 - Develop a concise statement of goals for the ITAC, list of members, expectations for members, anticipated meeting schedule, and description of how ITAC will shape project activities.
- Work with the ITAC and other project advisory committees to prepare a *Fleet Needs and Technology Maturity Assessment Framework* (draft and final) based on review of existing resources related to fleet needs for MDHD electrification in Southern California, including but not limited to:
 - A review of existing studies/assessments of Southern California fleet electrification needs to provide a description of methods, resources, and key assumptions to minimize duplication of existing efforts.
 - Development of a classification scheme to describe relevant truck market segments in coordination with regional planning partners. Expected market segments include: medium-duty local delivery vans and trucks; HD drayage; HD regional (which do not stop at ports like drayage); and long haul (interstate, long distance).
 - Previous studies and project partner travel data collection efforts as well as collect new data collected via CALSTART using dataloggers as needed in the Southern CA region on the operational characteristics of HD drayage and other truck segments as described above.
 - Goals, scope, and key content of the assessment.
 - Identification of geographic boundaries and local prioritization of public charging corridors in Southern California and expanding statewide.
 - Data access, collection, analysis and storage plans including the types of information, anticipated sources, and desired granularity.
 - Definition of industry engagement strategy(ies) (e.g., surveys, priority stakeholders) throughout the project and how they will inform assessment activities, including high power charging R&D.
 - Incorporation of the *Community Engagement Strategy and Equity Plan*.
 - Industry engagement evaluation metrics that may include but are not limited to:
 - Number of industry stakeholders surveyed.
 - Number of vehicles identified.
 - Statistical significance of dataset developed.
 - Amount of data collected.
 - Number of segment analysis completed.
 - Percent of population of total MHD truck market analyzed.
 - Potential electricity consumption from MHD electrification.

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Products:

- Fleet Needs and Technology Maturity Assessment Framework (draft and final)

Subtask 3.2 Conduct Southern California Region Fleet Needs and BEV Truck Technology Assessment

- Convene in-person and/or virtual ITAC meetings regularly to discuss project progress, solicit feedback, evaluate opportunities to expand partnerships and industry engagement, and document input received and how it was incorporated into project activities through *ITAC Meeting Summaries*.
- Complete the *Fleet Needs and Technology Maturity Assessment Framework* and continually document (e.g., in progress reports and project website updates) framework activities completed, how they informed project execution, and next steps including but not limited to:
 - Compilation of truck and fleet travel data to assess MHD electrification needs in Southern California and identification of data gaps.
 - Development of a *Freight Transport Industry Outreach Survey* and conduct a minimum of 20 surveys with key freight transport stakeholders including truck drivers, fleet operators, warehouse operators, industry associations, and other relevant groups to gather information on freight transport behavior and its implications for charging hardware and infrastructure.
 - The survey and data collection efforts should solicit information including but not limited to: data and statistical distributions of shift lengths; driving times; load sizes; stop times; on-site charging and fueling opportunities; opportunities and challenges to reducing or shifting peak MHD BEV charging load via intelligent charge management strategies to reduce peak power and site costs; other VGI and on-site charge management strategies being evaluated by fleets; opportunities and challenges to deploying stationary storage or other DER to limit site peak power or reduce costs; and future plans for charging infrastructure development.
 - Preparation of a *Truck Manufacturer Questionnaire and Interview Materials* and conduct interviews with a minimum of six MD or HD BEV truck manufacturers or key suppliers to identify and define parameters and vehicle characteristics that will effectively meet the operational requirements of drayage fleets and other relevant truck segments.
 - The questionnaire and interview materials should solicit information including but not limited to: vehicle availability and projected production volumes; vehicle battery size(s); battery system voltage; vehicle charging capabilities such as maximum charging power, communication and connector standards used; and hardware and software requirements and plans for managed charging, grid services or other VGI applications.
 - Develop a *Database of Industry Engagements* identifying all entities that received questionnaires, surveys, or interview materials, what entities responded, what additional entities should be targeted, and discussion of how representative participants are of the broader Southern California regional freight transport industry.
- Prepare an *Industry Outreach Memo* summarizing survey, questionnaire, and interview data and results, identifying key themes, and evaluating implications for this and future

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projects.

- Prepare a *Fleet Needs and BEV Truck Status Technical Memo* to summarize relevant studies, available data, and OEM truck and fleet readiness information collected in throughout this task.

Products:

- ITAC Meeting Summaries
- Freight Transport Industry Outreach Survey
- Truck Manufacturer Questionnaire and Interview Materials
- Database of Industry Engagements
- Industry Outreach Memo
- Fleet Needs and BEV Truck Status Technical Memo

Subtask 3.3 Conduct a High-Power Charging Technology Maturity Assessment

- Engage the ITAC and other project advisory committees and gather information from literature reviews, available product specifications, and other resources to assess the technology readiness, performance gaps, and R&D priorities for high-power charging technologies, including hardware, software, standards, and supporting infrastructure.
- Prepare a *High-Power Charging Equipment Manufacturer Questionnaire and Interview Materials* and conduct approximately six interviews with manufactures or component suppliers to gather data on performance capabilities.
 - The questionnaire and interview materials should solicit information including but not limited to: rated voltage and current levels; market coverage; standards used and interoperability with other makes of vehicles; cost and production volume projections; power requirements; equipment footprint; and efficiency.
- Prepare a *High-Power Charging Infrastructure Assessment Technical Paper* describing available and near commercial high-power charging hardware and software, as well as readiness of supporting infrastructure and standards. The paper should include but is not limited to the following:
 - Assessment of the technology readiness, estimated timeline for development, cost projections, and potential deployment scale.
 - Identification of performance gaps and research needs to improve charging system capabilities and enable grid benefits while meeting fleet needs.
 - Identification of existing and emerging regional charging networks for MDHD BEVs by market including both public and private stations.
 - Identification of hardware, software, or standards requirements for integration of DERs with deployment of high-power charging infrastructure.
 - Quantitative evaluation of the potential costs and benefits of integration of on-site energy storage, DERs and site energy management systems to be reduce peak loads, reduce charging or site costs, or provide other benefits without impacting fleet operational requirements.
 - Identification of hardware, software, or standards requirements for integration of VGI strategies with deployment of high-power charging infrastructure.
 - Quantitative evaluation of the potential costs and benefits of managed charging or other VGI strategies to reduce peak loads, reduce charging or site costs, or provide other benefits without impacts fleet operational requirements.

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- Description of innovations in finance and business models to support cost-effective charging solutions for fleet users, including but not limited to: energy-as-a-service models; incentive programs including the Low Carbon Fuel Standard; and municipal-backed finance programs.

Products:

- High-Power Charging Equipment Manufacturer Questionnaire and Interview Materials
- High-Power Charging Infrastructure Assessment Technical Paper

Subtask 3.4 Integrate and Present Freight Travel and BEV and Infrastructure Data

- Assemble data from previous studies, project partner travel datasets, preceding tasks, and collect new data using dataloggers as needed in the Southern California region, on the operational characteristics of HD drayage and other truck segments, including but not limited to:
 - Operational needs and range requirements including: number of miles per day; hours of operation and travel per day; number of stops per day; distance between stops; type of freight and its impact on range or charging/fueling equipment; length of time at stops/dwell time; time of the day for stops/dwell time; and travel characteristics such as truck weight and road grades that may impact range.
 - Truck traffic levels including: through trips versus regional trips; definition of the routes as fixed or variable; and proximity to disadvantaged and low-income communities.
 - Fleet characteristics including: evaluation of on-road time per vehicle per shift; vehicle range; payload capacity; battery capacity; system voltage; charging standard; maximum charging power; charging time; and estimated total cost of ownership.
- Prepare a *Regional Freight Heatmap 1.0* to geographically document and display truck travel data and other relevant information collected through previous studies, project partner datasets, and new data collected during the project.
- Develop and post a *BEV Infrastructure Toolkit* online for public accessibility that: summarizes key learnings and recommendations from relevant studies and tools. Include a checklist that will contain items such as permitting, timing, design guides, siting considerations for entities evaluating MDHD charging infrastructure deployments and provide links to relevant resources.
- Prepare and submit a *Fleet Charging Infrastructure Needs and Technology Maturity Assessment* (draft and final) incorporating the information and products from Subtasks 3.1-3.4 into a single report.
- Share findings with the public and target stakeholders, specifically incorporating approaches identified in the Community Engagement and Equity Strategy Plan to reach under-engaged populations.

Products:

- Regional Freight Heatmap 1.0
- BEV Infrastructure Toolkit
- Fleet Charging Infrastructure Needs and Technology Maturity Assessment (draft and final)

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TASK 4 ADVANCED HIGH-POWER CHARGER SYSTEM R&D

The goals of this task are to develop new high-efficiency high power charging components and systems that address the gaps and limitations identified in preceding tasks, focusing initially on centralized site DC power distribution, and to establish a testing center and equipment testing resources in the Southern California region that can be accessed by technology developers to accelerate the pace of innovation in high power charging technology development and deployment.

The Recipient shall:

Subtask 4.1 Develop a High-Power Charging Research and Development Plan

- Develop an *Alternative Charging Technology Evaluation and R&D Plan* (draft and final) that builds from previous Tasks and includes, but is not limited to, the following:
 - Identification, prioritization, of and justification for future research efforts based on performance gaps, fleet requirements, community needs, and business model considerations.
 - Descriptions of the alternative charging technologies and delivery architectures planned for evaluation, focused initially on centralized DC delivery equipment and expanding to other conductive, inductive, robotic/hands-free, mobile, and DER-integrated chargers.
 - Identification of current TRL and expected TRL as a result of planned research.
 - Evaluation of potential grid impacts and infrastructure deployment requirements of proposed innovations.
 - Assessment of how specific technologies facilitate ZEV adoption and project objectives.
- Participate in the CPR meeting and prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).

Products:

- Alternative Charging Technology Evaluation and R&D Plan (draft and final)
- CPR Report #1

Subtask 4.2 Establish Open-Access Research & Development Testing Center

- Establish a coordinated multi-lab Advanced Transportation Research Center at existing laboratories that is:
 - Primarily located within Southern California.
 - Provides an open process for manufacturers to apply for testing resources.
 - Enables real-time digital simulation (RTDS), hardware in the loop testing, and laboratory connectivity between project partners and other relevant research facilities.
- Prepare an *R&D Test Center Infrastructure Upgrade Plan* to identify necessary site improvements to the existing laboratories, including but not limited to:
 - Increased electrical capacity.
 - Equipment to facilitate quick installation and removal of devices.
 - Metering and monitoring equipment to isolate components and collect performance and other data.

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- RTDS, communication, and control capabilities to connect and provide functionality of charging equipment, emulated loads, energy storage and/or other DER, and grid simulation software.
- Implement the R&D Test Center Infrastructure Upgrade Plan. Upon completion disseminate an *Announcement of Advanced Transportation Research Center Opening* to stakeholders including equipment manufacturers, researchers, fleet operators, and utilities.
 - Include a description of testing capabilities, resources, and description of how stakeholders can apply to gain access to the center.

Products:

- R&D Test Center Infrastructure Upgrade Plan
- Announcement of Advanced Transportation Research Center Opening

Subtask 4.3 Research Plan Implementation

- Implement the *Alternative Charging Technology Evaluation and R&D Plan*, including but not limited to:
 - Commission and validation of charging equipment selected for Phase 1 demonstration.
 - Equipment and components in the targeted alternative charging technology design(s). Focusing initially on centralized site DC power distribution.
 - Testing and analysis of system performance including system efficiency, reliability, DC microgrid integration capabilities, AC grid integration capabilities, high-power operation, and interoperability.
- Recruit power electronic equipment manufacturers to develop and test prototype(s) of a high-power charging system(s) or key components that can meet the following performance targets:
 - Capable of providing 100 miles of range for a HD BEV drayage truck in less than 10 minutes.
 - Uses only open standards for connectors and communications.
 - Securely controllable from a cloud-based network and can be integrated with a local energy management system.
 - High efficiency from input to delivery to vehicle ($\geq 97\%$ at full load);
 - Modular design that can be scaled up with future BEV truck deployment; and delivered at a total cost below 500 \$/kW.
- Screen proposals submitted by equipment manufacturers for approval and work with selected equipment manufacturers to comply with the demonstration sites' terms and conditions, potential fees, and other applicable requirements.
- Prepare and implement *Technology Test Plans* for equipment to be tested at the facility, including but not limited to:
 - Identification of specific tests to be conducted with input from project advisory committees, that discusses prioritization, feasibility, and applicability.
 - Description of the proposed technology, goals and objectives of the test(s), approach to measurement and data collection, and applicability to project objectives.
 - Describe relevant certifications (e.g., UL 2202; UL 2231) and pathways for

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obtaining them as well as product listing in IOU or other programs.

- Prepare *Technology Test Reports* documenting the findings from the specific tests, including a summary of collected data and results, discussion of the system's ability to meet performance standards reliably and safely, and identification of next steps towards product commercialization.
- Prepare and submit a *High-Power Charging Equipment R&D Report* documenting the findings from all efforts conducted under this Task, including: a description of the equipment tested, procedures, and results; progression of prototype technology development and its ability to meet above specified performance targets; TRL status at the beginning and end of R&D; approach to address cost barriers; and pathway for commercial deployment or future R&D needs.

Products:

- Technology Test Plans
- Technology Test Reports
- High-Power Charging Equipment R&D Report

TASK 5 PHASE 1 PILOT DEPLOYMENT, EVALUATION, AND DATA REPORTING

The goals of this task are to complete a minimum of two initial pilot deployments of public MDHD BEV charging infrastructure in a targeted heavily trafficked freight corridor to support BEV drayage trucks and to collect and analyze data on the cost, utilization, and performance of pilot deployments.

The Recipient shall:

- Prepare and submit a *Pilot Deployment Plan* (for each site) for a minimum of two pilot sites describing the following information:
 - Timeline for deployment at each pilot site to include major milestone activities (e.g., design plan submissions, permit review, construction start and completion)
 - Project partners including fleets and pilot site hosts.
 - Engineering design plans and equipment layout.
 - Competitive bids that will be used to select appropriate engineering design, construction contractors, and equipment vendors.
 - Interconnection requirements, utility coordination, and related processes pursued at each pilot site.
 - Technical specifications of technologies that will be deployed including number of ports, power levels, distribution feed capacity sizing, estimated charging demand profile for each vehicle and the site as a whole; types of BEVs served, charging connector technology(ies) supported, charging management system and applicable standards, physical layout, and solar, storage, and potentially other DERs that will be integrated on-site.
 - Standards that will be used for both physical connectors and communications protocols, scalable network wide monitoring system for all chargers and integrated DERs, and VGI strategies leveraged to reduce peak demand and costs; and
 - Measurement and verification plan describing how performance of the installed technologies will be measured and validated.
- Solicit competitive bids for and select construction contractors and equipment vendors as

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appropriate to supply and install equipment. Update the budget with detailed engineering, construction, and equipment costs.

- Obtain all necessary permits, waivers, approvals, and utility interconnection agreements to deploy the corridor charging infrastructure at the pilot sites.
- Execute the *Pilot Deployment Plan* (for each site) by deploying public corridor charging infrastructure at the pilot sites.
- Over a minimum of 12 months, collect and regularly report data from the pilot sites, including but not limited to:
 - Number, owner/operator, and types (model, make) of BEV trucks charged per-day and other metrics to quantify utilization.
 - BEV truck charging profiles including power level, time of day, time connected, total energy transferred, charging duration, power factor, and electricity cost.
 - BEV truck battery state-of-charge and estimated vehicle range at beginning and end of charging events.
 - Frequency of corridor charging usage compared to depot charging usage (e.g., as fraction of charging events, as fraction of energy delivered to vehicle).
 - Capital and operations and maintenance costs associated with the site, including but not limited to, hardware and equipment, site preparation and installation, engineering services, networking costs, electricity costs and rate structures.
 - Potential monetary savings or other benefits from reduced requirements for centralized depot charging infrastructure.
 - Impacts, if any, of high-power charging on BEV battery degradation; qualitative data from fleets on ease of use and other customer feedback.
 - Data describing any cost reductions, GHG emissions reductions, reliability, and resiliency improvements enabled by DERs or VGI strategies.
- Quantify and document the costs and savings of any implemented VGI strategies and compare the cost of charging (e.g., \$/kwh, \$/mi, \$/trip) with VGI strategies to the cost of unmanaged charging.
- Evaluate the potential of the installed DERs to limit distribution system impacts, reduce energy costs for ratepayers, increase renewable energy utilization, and reduce charging costs for fleets. Quantify, document, and compare the costs (e.g., \$/kwh, \$/mi, \$/trip) and greenhouse gas emissions (e.g., kg CO₂eq/mi, kg CO₂eq/trip) of charging with DERs to charging entirely from the grid.
- Evaluate how the installed charging infrastructure impacts the flexibility and performance of BEV drayage trucks (e.g., increased average or maximum BEV truck route length, increased BEV truck payload throughput, adequate uptime/downtime to meet operational needs). Compare the performance of BEV drayage trucks with access to public corridor charging to conventional fossil fueled alternatives (e.g., \$/trip, time/trip).
- Evaluate opportunities to further improve energy efficiency, improve delivered electricity cost to fleets, reduce time for installation and, improve use of renewables through better utilization and integration of DERs and VGI.
- Evaluate how pilot site charging loads may change with increasing utilization.
- Prepare and submit a *Pilot Deployment Report* (for each site) documenting the results of the pilot deployments, including data collected and analyzed, lessons learned, and implications for future deployments including potential Phase 2 sites.
- Participate in the CPR meeting and prepare a *CPR Report #2* in accordance with subtask

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1.3 (CPR Meetings).

- If any additional pilot sites are identified and developed within this grant, the following limitations apply:
 - The pilot site must be located at an existing developed facility in a heavily trafficked location.
 - The additions to the facility must be made within the existing facility footprint.
 - The additions must be of the same character as for the initial two pilot sites, e.g., electrical upgrades, addition of charging equipment, etc.

Products:

- Pilot Deployment Plan (for each site) (draft and final)
- Pilot Deployment Report (for each site) (draft and final)
- CPR Report #2

TASK 6 PLAN FOR PHASE 2 PUBLIC CORRIDOR NETWORK

The goal of this task is to use the fleet needs and technology maturity assessment, learnings from the initial pilot deployment, and input from advisory committees to develop a sequential plan for future deployment and scale-up of an advanced high-power public charging network expanding from the targeted freight corridor(s).

The Recipient shall:

Subtask 6.1 Integrated Southern California Phase 2 Public Corridor Network Planning

- Identify existing and in-development public and private access charging stations that support MDHD BEV trucks to include information such as number of chargers and size
- Identify desired priority locations for public charging consistent with the findings in Task 3, including an assessment of potential public spaces.
- Consider the potential for charger utilization by MDHD trucks beyond drayage operations to evaluate opportunities to support a broader variety of vehicle types.
- Evaluate the use of existing truck parking locations for public charging to identify the benefits and key obstacles to use of these locations.
- Prepare a *Classification of Potential Site Locations* (consistent with Task 3) describing location type, ownership (public or private), potential spatial capacity, electrical distribution infrastructure capacity and requirement, surrounding traffic and circulation conditions, key assumptions made, factors that might change these assumptions, and logic for site deployment.
- Conduct site-level analyses that detail the steps needed to deploy high power charging infrastructure at priority location(s). Analyses include impacts of construction, traffic impacts such as sufficient space for vehicle maneuverability and queueing, community impacts, key stakeholder roles and responsibilities, equipment types to meet site needs, ability to standardize equipment, potential to utilize DERs and size of the system, design and construction duration, cost estimates for the total project including a breakdown between stakeholders incorporating available outside funding, incorporate relevant safety standards, and identify approaches to provide flexibility for future expansion.
- Determine how charging stations at priority location(s) will be operated including how the costs might be distributed between stakeholders and supplemented by external funding,

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hours of operation, estimated vehicle utilization per day, staffing requirements (internal or external to the site host), price models, and community impacts and opportunities.

- Update the Regional Freight Heatmap 1.0 to *Regional Freight Heatmap 2.0* to present multiple layers of deployment of private, primary public, and secondary public stations and the required grid capacity needed at each site to support full deployment of ZE trucks in Southern California. Present the number of chargers, power requirements, and potential vehicle throughput at each site on the heatmap.
- Prepare a *Regional Site-Level Analysis Technical Report* summarizing the findings for each priority location(s) including key site characteristics, why the site was prioritized and advantages for installing high power charging infrastructure in that location, and relevant visuals, layouts, and maps. Include recommendations for potential phasing of deployments to support the growth of a regional charging network for ZE trucks, which may include site recommendations for Phase 2 deployments.

Products:

- Classification of Potential Site Locations
- Regional Freight Heatmap 2.0
- Regional Site-Level Analysis Technical Report

Subtask 6.2 Statewide Phase 2 Corridor Planning

- Assess the extent to which the corridor data collected is representative and can be generalized to other BEV truck and drayage operations across the state. Examples of statewide data to collect and assess include but are not limited to: the statistical distribution of route lengths; geographic and traffic information about extended routes; and refueling and parking frequencies and locations.
- Analyze collected data to: 1) Evaluate commodity type/weight carried by drayage trucks and provide information on the typical movement of goods along key corridors between major freight hubs in the state; 2) Define quantities of commodities/goods at key port, warehouse, and distribution centers; and 3) Develop a template that characterizes typical BEV truck and drayage operation scenarios to help planning partners evaluate public HD charging site locations that would best support and provide convenience to fleets.
- Model charging loads and augment available models to identify potential locations and quantities of charging stations, dispensers, power, and energy requirements in key corridors to support anticipated and/or projected BEV truck volumes.
- Update Regional Freight Heatmap 2.0 to *Regional Freight Heatmap 3.0* to evaluate and prioritize locations for public truck charging along statewide transportation corridors, including critical planning filters such as: state corridors/major roadways, freight flow/concentration of truck movement, freight hubs (e.g., ports, warehouses, distribution centers), major truck stops, utility territory, grid capacity, location of existing charging for MD/HD vehicles, proposed zero-emission zones or locations requiring MD/HD ZEV adoption, and disadvantaged communities, tribes, impacted communities.
- With input from project advisory committees, establish a framework and criteria to prioritize public charging infrastructure deployment sites to guide future investments including potential Phase 2 deployments toward areas with the greatest need and opportunity (e.g., fleet operational needs, truck traffic, technology capabilities, grid capacity, air quality and public health benefits, workforce development, and community support) while laying a foundation to accelerate statewide HD BEV deployment.

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- Develop and submit a *Phase 2 Statewide Corridor Charging Infrastructure Deployment Plan* that includes, but is not limited to:
 - Sequential plan for design, planning, and deployment activities for the corridor charging infrastructure at priority sites.
 - Estimation of infrastructure, equipment, and construction costs and installation timeframes necessary for proposed Phase 2 corridor charging sites, as well as achievable targets through future research. Include details on additional financial support available through various utility programs, incentives, local, state, and federal grants and rebates.
 - Description of anticipated permitting, interconnection, engineering design and construction processes for Phase 2 deployment sites including tentative schedule for exchanges between site hosts, utilities, and local authority having jurisdictions.
 - Assessment of the extent to which VGI and charge management strategies can be used to optimize charging time and power level to reduce costs.
 - Evaluation of the potential for deploying DERs such as on-site renewable generation and stationary storage and the size of the system to limit impacts to distribution systems and reduce costs to both fleets and IOU ratepayers.
 - Description of how the proposed public charging corridor will be integrated with fleet operations, including details on any fleet management systems and communications between charging sites, vehicles, and fleet managers.
 - Business models and approaches for sustaining long-term investment in MDHD BEV charging infrastructure.

Products:

- Regional Freight Heatmap 3.0
- Phase 2 Statewide Corridor Charging Infrastructure Deployment Plan (draft and final)

TASK 7 KNOWLEDGE TRANSFER & GUIDEBOOK

The goals of this task are to leverage project findings and the stakeholder team to disseminate lessons learned to appropriate stakeholders, evaluate best practices, identify opportunities for streamlining, and facilitate the design and implementation of future public HD charging deployments in freight corridors.

The Recipient shall:

- Establish and maintain an online *Project Website* to post information about the project throughout its entire term, including deliverables associated with the project, lessons learned, and additional resources to support education and workforce development across the industry.
- Prepare and submit an *Outline of the Guidebook for Advanced BEV Charging* to solicit feedback from the CAM, project advisory committees, and other stakeholders.
- Prepare and submit a *Guidebook for Advanced BEV Charging* that consolidates project findings, evaluates best practices, identifies remaining barriers and opportunities for streamlining, and facilitates the design and implementation of future corridor charging infrastructure research, development, demonstration, and deployment.
 - Develop and include recommendations, tools, and other resources that can facilitate deployment at other sites, such as: frequently asked questions,

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checklists, fact sheets, timelines, design templates, process flow diagrams, cost estimation tools, and other software design tools.

- Consistent with Task 10 Technology/Knowledge Transfer Activities, coordinate and host public workshop(s), webinars, and other knowledge transfer activities to share project results, benefits, limitations, lessons learned, and best practices described in the guidebook. Activities may include technology exhibitions, 'Voice of the Customer' events that focus on engaging the end users and providing a platform for stakeholders to better understand the needs of the end user, user experience and best practices publications, infrastructure technology solution working groups, and workforce training and job fairs.

Products:

- Project Website
- Outline of the Guidebook for Advanced BEV Charging
- Guidebook for Advanced BEV Charging

TASK 8 PHASE 1 REVIEW AND PHASE 2 PROPOSAL

The goals of this task are to present Phase 1 project progress and propose continued Phase 2 work.

The Recipient shall:

- Provide *Written Notification of Phase 1 Milestone Completion* upon the completion of the following milestones:
 - The prototype advanced high-power charging system must be developed, built, and operational. Performance metrics validated under relevant laboratory or real-world conditions must be collected and reported to the CAM.
 - The Phase 1 initial corridor charging site(s) must be deployed and operational. At the minimum, 6 months of performance data from the initial corridor charging sites must be collected and reported to the CAM.
 - A draft of the Plan for Phase 2 must be submitted to the CAM that details the Phase 2 site selection and design, including anticipated utilization, site layouts, and equipment specifications for chargers and DERs.
 - Drafts of revised agreement documents including the Scope of Work, Project Schedule, and Budget Forms must be submitted to the CAM for Phase 2 activities.
 - The CEQA Compliance Form must be submitted to the CAM for each of the Phase 2 site(s) selected.
 - Site commitment letters signed by authorized representatives of the proposed Phase 2 deployment sites must be provided to the CAM.
 - Match funding commitment letters signed by authorized representatives of each entity or individual that is committing to providing match funding must be provided to the CAM pursuant of meeting the minimum 50% match funding requirement for Phase 2.
- Participate in the CPR meeting and prepare a *CPR Towards Phase 2 Report* in accordance with subtask 1.3 (CPR Meetings) that discusses the progress of the Agreement toward achieving its goals and objectives and includes recommendations and conclusions regarding continued work on the project.
- Develop and disseminate a publicly available *Final Report* in accordance with Subtask

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1.6.2 (Final Report) that:

- Summarizes Phase 1 project progress made to date on Phase 1 technical tasks, including challenges, successes, key findings, estimated benefits, performance metrics, and technology and knowledge transfer activities.
- Includes the proposed detailed plan for Phase 2 work including proposed site(s).

Products:

- Written Notification of Phase 1 Milestone Completion
- CPR Towards Phase 2 Report (consistent with Task 1.3)

TASK 9 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

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- 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 technical journals; A comparison of project expectations and performance. Discuss whether the goals and objectives have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.
- The CEC may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 10 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to conduct activities that will accelerate the commercial adoption of the technology being supported under this agreement.

The Recipient Shall:

- Develop and submit a *Technology Transfer Plan (Draft/Final)* that identifies the proposed activities the recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the *Draft Technology Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Technology Transfer Plan*. This document will identify: 1) TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan* and 2) TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the *Final Technology Transfer Plan* to the CAM for approval.
- Implement activities identified in *Final Technology Transfer Plan*.
- Develop and submit a *Technology Transfer Summary Report (Draft/Final)* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the *Final Technology Transfer Plan*. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for a CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual CEC-sponsored EPIC symposium(s).
- 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

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related project photographs.

Products:

- Technology Transfer Plan (Draft/Final)
- Summary of TAC Comments
- Technology Transfer Summary Report (Draft/Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: ELECTRIC POWER RESEARCH INSTITUTE, INC.

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

RESOLVED, that the CEC approves Agreement EPC-21-010 with Electric Power Research Institute, Inc. (with major subcontractor CALSTART, Inc.) for a \$12,999,155 grant to fund applied research and development and technology demonstration and deployment activities through creation of a research hub focused on electric heavy-duty drayage trucks. The research hub will advance high power charging technologies and engage a broad network of stakeholders and communities to deploy public access charging infrastructure for MD/HD vehicles in a heavily-trafficked freight corridor; and

FURTHER BE IT RESOLVED, that the Executive Director or their designee shall execute the same on behalf of the CEC.

CERTIFICATION

The undersigned Secretariat to the CEC 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 CEC held on October 13, 2021.

AYE:

NAY:

ABSENT:

ABSTAIN:

Liza Lopez
Secretariat