



STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

A) New Agreement # EPC-22-006 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Katelynn Dinius	43	916-776-3468

C) Recipient's Legal Name	Federal ID Number
Center for Transportation and the Environment, Inc.	58-2052891

D) Title of Project
"V2B Oakland"

E) Term and Amount

Start Date	End Date	Amount
9/30/2022	6/30/2025	\$ 3,199,969

F) Business Meeting Information

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

Proposed Business Meeting Date 9/14/2022 ☐ Consent ☒ Discussion

Business Meeting Presenter Katelynn Dinius Time Needed: 5 minutes

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

Agenda Item Subject and Description:

Center for Transportation and the Environment, Inc. Proposed resolution approving Agreement EPC-22-006 with Center for Transportation and the Environment, Inc. for a \$3,199,969 grant to develop and demonstrate bidirectional charging capabilities for electric transit buses, and adopting staff's determination that this action is exempt from CEQA. The project will demonstrate use of electric transit buses to provide backup power to critical loads at a bus depot and a public facility in Oakland.

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, § 15303 ; Cal. Code Regs., tit. 14, § 15306

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

Explain reason why Agreement is exempt under the above section: Cal. Code Regs., tit 14, sec. 15301 provides that projects that consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical



features, involving negligible or no expansion of existing or former use, are categorically exempt from the provisions of CEQA. The locations affected by the proposed project are at existing facilities, which have already been graded, disturbed, paved, and have structures constructed. Installation and deployment of the electric vehicle (EV) charging infrastructure would require limited alteration activities such as minor trenching for electrical conduit, delivery and placement of commercial electric vehicle charging equipment, and minor paving and concrete activities to restore the disturbed surfaces. The project activities involve negligible or no expansion of existing or former use and will not have a significant effect on the environment and thus fits within section 15301.

Cal. Code Regs., tit 14, sec. 15303 provides that projects that consist of construction and location of limited number of new, small facilities or structures, and installation of small new equipment and facilities in small structures, are categorically exempt from the provisions of CEQA. This project includes the installation and construction of two EV charging equipment at existing sites that have been paved and they will be accessory structures to the existing structures. The project also involves upgrading electrical systems at the two facilities to accommodate advanced power controls, new HVAC and air filtration systems. Thus, the project is categorically exempt from CEQA

Cal. Code Regs., tit 14, sec. 15306 provides that projects that consist of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource, are categorically exempt from the provisions of CEQA. The project demonstration will utilize zero-emission buses and take place entirely within the confines of the New Flyer, AC Transit, and City of Oakland owned facilities selected for the project and will not introduce any harmful contaminants or produce any local emissions as a result of project activities. Nor would the project create any impacts to air and water quality, or the natural and human environments. The project activities will not have a significant effect on the environment and fits within section 15306.

This project does not involve impacts on any particularly sensitive environment; any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5, and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2 apply to this project and this project will not have a significant effect on the environment.



STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

- 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
New Flyer of America Inc.	\$ 97,500
The Mobility House, LLC	\$ 619,021
Schneider Electric USA, Inc.	\$ 1,659,683
West Oakland Environmental Indicators Project	\$ 95,000 (\$350,000 Match)
TBD - Electrical Contractor	\$ 413,000
TBD - Civil	\$ 177,000
Rhombus Energy Solutions, Inc.	\$ 201,586
Alameda-Contra Costa Transit District (AC Transit)	\$ (\$400,000 Match)

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	21-22	301.001I	\$3,199,969

R&D Program Area: EGRO: Transportation

TOTAL: \$3,199,969

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

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

Name: Jason Hanlin

Address: 730 Peachtree St Ne Ste 450

Ste 450

City, State, Zip: Atlanta, GA 30308-1244

Phone: 404-808-6489

E-Mail: jason@cte.tv

2. Recipient's Project Manager

Name: Patrick Callahan

Address: 2041 Bancroft Way, Suite 210



STATE OF CALIFORNIA
GRANT REQUEST FORM (GRF)
CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

City, State, Zip: Berkeley, CA
94704
Phone: 269-718-4547

E-Mail: pj@cte.tv

L) Selection Process Used

- ☒ Competitive Solicitation Solicitation #: GFO-21-303
- ☐ 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

Exhibit A
Scope of Work
Center For Transportation and the Environment

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Battery Electric Bus and Charger Modification for Bidirectional Charging Capability
3	X	Fuel Cell Electric Bus Modification for Bidirectional Charging Capability
4	X	Charger Installation and Facility Modifications
5		Demonstration, Data Collection, and Analysis
6		Community Outreach
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
BEB	Battery Electric Bus
BEPS	Bus Exportable Power Supply
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
CTE	Center for Transportation and the Environment
FCEB	Fuel Cell Electric Bus
PSPS	Public Safety Power Shutoff
TAC	Technical Advisory Committee
V2B	Vehicle to Building

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the design, build, deployment, and evaluation of a highly resilient and cost-effective energy and charging system that utilizes electric transit buses along with bidirectional chargers to provide vehicle-to-building (V2B) back-up power during emergencies, disasters, blackouts, and public safety power shutoffs (PSPS) for critical building loads and/or emergency management resources in the community. By developing and proving out bus exportable power supply (BEPS) technologies combined with V2B technology, this project intends to show benefits related to resilience, health improvements, environmental sustainability, and cost savings to California investor-owned utility (IOU) ratepayers and communities across the country.

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.

Exhibit A
Scope of Work
Center For Transportation and the Environment
B. Problem/ Solution Statement

Problem

Resilience of electrical infrastructure is a significant and growing problem in California, as a changing climate imposes higher temperatures and increases the incidence of devastating disasters and power outages. These events can disrupt the electrical grid with simultaneous energy demand straining capacity, or physical destruction of infrastructure imposing prolonged outages. In addition, traditional backup power generators have proven to be lacking in availability, slow to deploy, and unreliable.

Energy storage assets are underutilized when electric-drive vehicles with significant onboard energy storage sit idle. Studies have shown that transit buses can play a valuable role in providing back up power for the community, but have also identified challenges with implementation, commercialization, and coordination of the requisite additional hardware and software.

Solution

The project team proposes to leverage an existing transit battery electric bus (BEB) and fuel cell electric bus (FCEB) deployment to build a resilient and cost-effective solution that is available to provide backup power to critical building loads in the community. This proposed architecture will offer resilience benefits using bidirectional charging during emergencies, disasters, wildfires, brownouts, and PSPS to provide backup power from the transit buses.

Ultimately, the concept carries forward much of the benefits and recommendations made in the Federal Transit Administration investigation of bus exportable power, but the V2B approach addresses many of the challenges identified in the report. These challenges are addressed by relying on bidirectional charger development, hardware, and standards to address commercialization concerns, minimizing costs to transit agencies for BEPS-related upgrades, providing established parking and connection areas at critical emergency relief sites for BEPS-equipped buses. Broad industry support already exists for resilient transit features in emergency and disaster response situations, and the project team believes this approach can provide a practical and marketable solution.

The project will demonstrate a practical solution to providing expedited backup energy supply to communities in need through the following aspects:

- Transit buses and agencies are established in many communities.
- Electric buses, electric school buses, fuel cell electric buses and other trucks that adopt the bidirectional functionality proven under this project can also be used for emergency response at the equipped facilities.
- Bidirectional chargers can also be used for V2B services, increasing the value proposition of installation.
- Exportable power capability increases the value, and in turn sales, for BEBs and FCEBs in outage- and disaster-prone areas.
- By utilizing bidirectional chargers, ancillary technology, and installation standards and practices, BEPS system functionality, marketability, utility, and commercialization is enabled using existing commercial-off-the-shelf hardware development, volumes, and standards development/implementation.
- The required bus and charging system enhancements to achieve BEPS and vehicle-to-grid (V2G) capability is a straightforward and inexpensive addition.

Exhibit A
Scope of Work
Center For Transportation and the Environment
C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this agreement is to demonstrate that, through the proposed system, buses with significant energy storage capacity can become integral components of a resilient and cost-effective bidirectional charging setup that provides various services to the project hosts, local community, and power grid. In particular, the goal is to demonstrate that, in the event of a power outage, that electric and fuel cell transit buses can provide power to critical building and emergency management loads.

Ratepayer Benefits:²

Deployment of this technology specifically benefits California IOU ratepayers by avoiding fossil fuel use from backup generators and increased site or community resilience to electric outages. Each BEB-supplied V2G system is expected to provide up to 125 kW of power and 350 kWh of energy to the facility. Each FCEB-supplied V2G system is expected to provide up to 85 kW and 650 kWh of energy to the facility. (While this demonstration only includes one bus each, unlimited energy supply could be provided by swapping out BEPS-enabled buses.) This demonstration is anticipated to support approximately 60 kW of critical facility load. A 75-kW diesel generator running at $\frac{3}{4}$ load consumes approximately 4.6 gallons of fuel per hour.³ By utilizing the zero-emission buses to support the backup power needs at the facility, PG&E ratepayers avoid consumption of 4.6 diesel gallons per hour.

The demonstration proposed for the V2G solution increases resiliency by providing a temporary shelter for disadvantaged residents with access to clean, filtered air at the library. This solution has the added benefit of providing a location with clean air during wildfires that lead to smoke, poor air quality, and power outages.

Additional non-energy benefits include significant greenhouse gas emission reductions and criteria pollutant emission reductions. Avoiding the estimated diesel consumption leads to avoidance of 99.9 lb-CO₂ per hour, 0.53 lb-CO per hour, 2.5 lb-NO_x per hour, and 0.18 lb-PM per hour.⁴

Cost savings to public and private facility owners in the IOU district can also be realized with V2G infrastructure deployment. Capital cost savings are expected over installation of stationary generators, especially if charging systems are already being deployed and V2G capability is enabled. Operating costs savings over rental generators is expected to be up to \$3,900 per day.⁵ In addition, the technology increases the value of their public transportation system.

² California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

³ https://www.generatorsource.com/Diesel_Fuel_Consumption.aspx

⁴ <https://www.mecknc.gov/LUESA/AirQuality/PermittingRegulations/Documents/icesmallengine%20with%20Instruction%20Tab%20added.xls>

https://www.michigan.gov/documents/deq/deq-ess-caap-pte-generatorPTE_234315_7.pdf

⁵ Using calculator developed by <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/147716/bus-exportable-power-supply-system-use-strategy-investigating-use-transit-buses-emergency-generators.pdf>

Exhibit A Scope of Work Center For Transportation and the Environment

Technological Advancement and Breakthroughs:⁶

All equipment proposed in this project is commercial off-the-shelf and all subsystems have been successfully demonstrated. Further, some of the subsystems have been demonstrated on other platforms, such as passenger vehicles and school buses in related applications. However, the system-level approach and use of BEPS are novel and will be a first-of-its-kind demonstration. Systems integration on the scale proposed has not been demonstrated as of this proposal's writing, and not with a focus on resilience. Proper design and integration of this hardware and the related software components will allow for a flexible and effective energy ecosystem by providing islanded energy supply to local building loads during energy outages, and more efficient and sustainable operation during routine operation. Development of plans, procedures, and technology transfer activities will also be accomplished in parallel with the technology development and demonstration activities to enable broader adoptions of the V2B approach. Successful completion of this project will show that any site that has the *bidirectional charging* system components *installed* can accept and utilize existing mobile energy sources of electric transit buses, hybrid transit buses, and electric school buses.

Agreement Objectives

The objectives of this Agreement are to:

- Upgrade an existing AC Transit New Flyer battery electric bus to allow bidirectional charging capability
- Build, test, and validate a V2G system to ensure performance and reliability of the system
- Upgrade an existing AC Transit New Flyer fuel cell electric bus to allow bidirectional power flow through J1772 CCS 1 inlet
- Install bidirectional charger systems at two public facilities connected to building critical loads with safe, transfer switching
- Complete emergency response demonstrations at each facility to evaluate performance and effectiveness of the V2G systems
- Complete technology transfer activities to educate and promote widespread deployment of the approach to community resilience

Exhibit A
Scope of Work
Center For Transportation and the Environment

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. 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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

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.
 - 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);

Exhibit A

Scope of Work

Center For Transportation and the Environment

- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Technical products (subtask 1.1);
 - Progress reports (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

Exhibit A

Scope of Work

Center For Transportation and the Environment

location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

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.
- 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 the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)

CAM Products:

- CPR Agenda(s)
- Progress Determination

Subtask 1.4 Final Meeting

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

The Recipient shall:

- Meet with 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.

Exhibit A Scope of Work

Center For Transportation and the Environment

- 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.
- 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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

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.

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

Exhibit A

Scope of Work

Center For Transportation and the Environment

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
- 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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
 - 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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of 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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

The TAC may be composed of qualified professionals spanning the following types of disciplines:

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

The Recipient shall:

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

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

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.

Exhibit A

Scope of Work

Center For Transportation and the Environment

- 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 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 to proposed project performance metrics.
- Review and provide comments to 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 finalize key project performance targets based on feedback from the TAC and report on final results in achieving those targets. 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 project performance metrics from the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics 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 *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
 - TAC comments the Recipient does not propose to incorporate with and explanation why.
- 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 Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:

- TAC Performance Metrics Summary
- Project Performance Metrics Results

Exhibit A Scope of Work

Center For Transportation and the Environment

IV. TECHNICAL TASKS

TASK 2 BATTERY ELECTRIC BUS AND CHARGER MODIFICATION FOR BIDIRECTIONAL CHARGING CAPABILITY

The goal of this task is to modify the BEB and the charger to enable bidirectional charging and BEPS capabilities to support overarching project requirements and goals. This task includes the necessary design, modification, and test and validation work to verify V2B system performance, reliability, and interoperability between components. To test and validate performance, an integrated system will be built for connection to the bus including the charger, automatic transfer switch, panel, load bank, supporting interconnections and data monitoring instruments.

The Recipient shall:

- Develop *BEB Requirements Definition Report* that includes, but is not limited to, system use cases, control signals and data exchanges between sub-systems, applicable communication protocols and standards (on all levels, including while in off-grid mode and while connected to grid), and data acquisition requirements.
- Complete design of BEPS system, including hardware and software definition.
- Procure bus hardware.
- Modify battery electric bus for bidirectional charging capability.
- Procure chargers and related system hardware.
- Develop charger software and incorporate necessary updates.
- Build fully integrated V2B test system.
- Test and validate bidirectional charging capability and performance.
- Prepare *BEB System Integration and Validation Report* that includes, but is not limited to, procedure for testing and validating system performance, results of testing, discussion of results, and lessons learned during design, modification, integration, and testing.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in CPR meeting #1.

Products:

- BEB Requirements Definition Report
- BEB System Integration and Validation Report
- CPR Report #1

TASK 3 FUEL CELL ELECTRIC BUS MODIFICATION FOR BIDIRECTIONAL CHARGING CAPABILITY

The goal of this task is to modify the FCEB to enable bidirectional charging and BEPS capabilities to support overarching project requirements and goals. This task includes the necessary design, modification, and test and validation work to verify subsystem performance, reliability, and interoperability between components. Test and validation of the bus will utilize the V2B test system developed in Task 2.

The Recipient shall:

- Develop *FCEB Requirements Definition Report* that includes, but is not limited to, system use cases, control signals and data exchanges between sub-systems, applicable communication protocols and standards (on all levels including while in off-grid mode and while connected to grid), and data acquisition requirements.

Exhibit A
Scope of Work
Center For Transportation and the Environment

- Complete design of BEPS system, including hardware and software definition.
- Procure bus hardware.
- Modify fuel cell electric bus for bidirectional charging capability.
- Test and validate bidirectional charging capability and performance using V2B test system.
- Prepare *FCEB System Integration and Validation Report* that includes, but is not limited to, procedure for testing and validating system performance, results of testing, discussion of results, and lessons learned during design, modification, integration, and testing.
- Prepare a *CPR Report #3* in accordance with subtask 1.3 (CPR Meetings).
- Participate in CPR meeting #3.

Products:

- FCEB Requirements Definition Report
- FCEB System Integration and Validation Report
- CPR Report #3

TASK 4 CHARGER INSTALLATION AND FACILITY MODIFICATIONS

The goal of this task is to complete the civil, mechanical, and electrical design activities necessary to complete construction and installation of the charging infrastructure and building tie-ins being deployed for each site. The chargers used in Task 2 and 3 for the bus modification will be de-commissioned and shipped to one of the demonstration sites.

The Recipient shall:

- Establish site and V2B service requirements for each site. Requirements include but are not limited to:
 - Evaluation of available backup power and energy from BEPS system, establishment of supported loads, evaluation of load management capabilities, and establishment of isolation requirements.
 - Defined process and coordination details including, charge point siting considerations, competing roles for BEPS-equipped buses during outages (e.g., transit service, evacuations, powering facilities), and priority at the charger for BEPS services versus public charging.
- Complete Preliminary Design Packages (one for each site) at 30 percent design competition that include but are not limited to:
 - Technical criteria and assumptions used for the preferred design and includes an evaluation of code interpretation and permit requirements for the project.
 - Definition of project scope, budget, and schedule. For the primarily electrical system, the major components of the design include a single line diagram, equipment layout with approximate equipment size and clearance requirements, preliminary sizing and routing of electric circuit, major design aspects demonstrating compliance with the National Electric Code, and utility interconnection requirements.
- Complete Critical Design Packages (one for each site) at 60 percent design completion that include but are not limited to:
 - Permitting requirements, constructability, and value engineering.
 - Finalized equipment specifications and acquired/evaluated vendor quotes.

Exhibit A

Scope of Work

Center For Transportation and the Environment

- Complete *Final Design Packages* (one for each site) at 100 percent design completion that include but are not limited to:
 - Final engineering documents with all the design details complete, compliance comments resolved, QA-checked, and final-assembly of documents including a PE seal. This pack is appropriate for permitting the project and moving the project into the construction phase.
- Procure all hardware and deliver to sites.
- Complete construction and installation at each site.
- Develop *System Commissioning Plans* (one for each site).
- Complete commissioning for each site following the System Commissioning Plans.
- Document system readiness with *System Commissioning Reports* (one for each site).
- Submit an *AB 841 Certification* that certifies the project has complied with all AB 841 (Ting, Chapter 372, Statutes of 2020) requirements specified in Exhibit C or describes why the AB 841 requirements do not apply to the project. The certification shall be signed by Recipient's authorized representative.
- Submit *Electric Vehicle Infrastructure Training Program (EVITP) Certification Numbers of Each EVITP-Certified Electrician* that installed electric vehicle charging infrastructure or equipment. EVITP Certification Numbers are not required to be submitted if AB 841 requirements do not apply to the project.
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in CPR meeting #2.

Products:

- Final Design Packages
- System Commissioning Plans
- System Commissioning Reports
- *AB 841 Certification*
- Electric Vehicle Infrastructure Training Program (EVITP) Certification Numbers of Each EVITP-Certified Electrician
- CPR Report #2

TASK 5 DEMONSTRATION, DATA COLLECTION, AND ANALYSIS

The goal of this task is to demonstrate the V2B system under both simulated and live conditions. Data collection and analysis will also be performed to measure the performance and effectiveness of the system.

The Recipient shall:

- Finalize the *Measurement & Verification Plan* that includes, but is not limited to, all required qualitative and quantitative parameters defined by CEC.
- Develop a *Demonstration Plan* to describe test objectives, procedures, conditions, communications, personnel, facilities, and equipment used for each demonstration activity and to distinguish between live demonstrations and simulated demonstrations.
- Prepare for demonstration activities, including performing necessary training for operations.
- Perform simulated V2B demonstration and emergency response exercises at each site.
- Perform V2B operations during emergencies, disasters, and outages, throughout demonstration period.

Exhibit A

Scope of Work

Center For Transportation and the Environment

- Provide support for the V2B infrastructure to ensure optimal operation of the equipment during each demonstration.
- Complete data collection (e.g., power (kW) and energy (kWh) required by the facilities in off-grid mode, power delivered to facility loads, cumulative energy delivered to sites, battery state of charge before and after charging and discharging events, etc.) and perform analysis of data following each demonstration event to produce a *Measurement and Verification Report*.

Products:

- Measurement and Verification Plan
- Demonstration Plan
- Measurement and Verification Report

TASK 6 COMMUNITY OUTREACH

The goal of this task is to complete local community outreach to increase awareness and provide education about V2B capability. The community-based organization will build on their existing clean energy outreach and education efforts through a variety of means to inform the community of the benefits of this program.

The Recipient shall:

Present V2B project details and educational materials related to zero emission vehicles, potential benefits of vehicle to building power systems, and infrastructure needs for zero emission vehicles in disadvantaged communities through a variety of channels.

- Develop the *Community Outreach and Engagement Plan*.
- Develop and direct *Community Presentation* to present to neighborhood associations and community leadership groups.
- Develop *Educational Material* and project specific posts to social media outlets, emphasizing the "cool science" and community resilience benefits of the pilot project
- Develop project highlights and educational materials and publish to community-based organization website.
- Provide direct engagement with the primary users of the project site.

Products:

- Community Outreach and Engagement Plan
- Community Presentation
- Educational Material

TASK 7: EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete the *Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by December 15th of each year. The Annual Survey includes but is not limited to the following information:
 - Technology commercialization progress

Exhibit A
Scope of Work
Center For Transportation and the Environment

- New media and publications
- Company growth
- Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)
- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

TASK 8: 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. Recommended activities include, but are not limited to, the following:

- Scale-up and marketing analysis for product offering the bus exportable power across electric drive platforms by the bus OEM
- Develop and market program results and benefits summaries targeted to the various stakeholder groups including transit agencies, school districts, and emergency response communities
- Develop guidance for deploying bidirectional charging with facility tie-ins for the purpose of providing resilient charge points for communities and emergency management agencies, including MTC. Guidance should include methods for siting, procurement, engineering and construction as well as potential sources for funding assistance
- Evaluate technology applicability for other medium- and heavy-duty truck markets
- Establish a public database for tracking and locating resilient charge points across the country

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.

Exhibit A
Scope of Work
Center For Transportation and the Environment

- 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:
 - TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.
 - 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 an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

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: Center for Transportation and the Environment, 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-22-006 with Center for Transportation and the Environment, Inc. for a \$3,199,969 grant to develop and demonstrate bidirectional charging capabilities for electric transit buses. The project will demonstrate use of electric transit buses to provide backup power to critical loads at a bus depot and a public facility in Oakland; 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 September 14, 2022.

AYE:

NAY:

ABSENT:

ABSTAIN:

Dated:

Liza Lopez
Secretariat