



STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

A) New Agreement # ARV-21-043 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
600 Fuels and Transportation Division	Manuel Aguila	27	916-891-9138

C) Recipient's Legal Name	Federal ID #
Electriphi, Inc.	83-1732982

D) Title of Project
The Sacramento Electric School Bus – Vehicle-Grid-Integration Project (ESB-VGI Project)

E) Term and Amount

Start Date	End Date	Amount
11/15/2021	12/31/2024	\$ 1,450,983

F) Business Meeting Information

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

Proposed Business Meeting Date 11/15/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Kyle Corrigan Time Needed: 5 minutes

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

Agenda Item Subject and Description:

ELECTRIPHI, INC. Proposed resolution approving Agreement ARV-21-043 with Electriphi, Inc. for a \$1,450,983 grant to demonstrate the potential for accelerated commercial deployment of an advanced utility and grid-integrated smart charging management system in the context of a large and diverse school fleet, and adopting staff's determination that this action is exempt from CEQA. (Clean Transportation Program funding). Contact: Kyle Corrigan. (Staff Presentation: 5 minutes)

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":

Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because .

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

a) ☒ Agreement **IS** exempt.

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

☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14 §§ 15301, 15303

Cal. Code Regs., tit. 14, sect. 15301 provides that operation and minor alteration of existing facilities and vehicle operations are categorically exempt from the provisions of CEQA under the Class 1 categorical exemption for the operation, repair, maintenance, and/or minor alteration of existing structures, facilities, and/or mechanical equipment involving negligible expansion of existing use. Proposed work will occur at two locations, both of which are existing school bus

**GRANT REQUEST FORM (GRF)**

lots at schools. No grading is expected and associated minor trenching and minor boring entails short alignments in already paved area or yard lawn turf.

Cal. Code Regs., tit. 14, sect. 15303 provides that projects which consist of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure, are categorically exempt from the provisions of CEQA. At each of the two locations, installation of the battery chargers and associated infrastructure and equipment will be located in urbanized areas and the total poured pad sizes will not exceed 2500 square feet. Upgrades to existing electrical panels may occur. The total on-ground floor area footprint (EV chargers, electrical infrastructure and equipment, electrical lines, signs, protective bollards) for all development activities, will be less than 5,000 square feet.

☐ Common Sense Exemption. 14 CCR 15061 (b) (3) Explain reason why Agreement is exempt under the above section:

- 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
TBD - Project	\$ 200,000
The Cadmus Group	\$ 174,916

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

Legal Company Name:
Sacramento Municipal Utility District (SMUD)
Twin Rivers Unified School District (TRUSD)



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J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
ARFVTP	FY 18/19	601.118K	\$1,450,983
Funding Source			\$
Funding Source			\$
Funding Source			\$
Funding Source			\$

R&D Program Area: Select Program Area TOTAL: \$ 1,450,983

Explanation for "Other" selection

Reimbursement Contract #:

Federal Agreement #:

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

Name: Muffi Ghadiali

Address: 1155 Indiana Street

City, State, Zip: San Francisco, CA 94107

Phone: 408-679-0151

E-Mail: mghadial@ford.com**2. Recipient's Project Manager**

Name: TBD

Address:

City, State, Zip:

Phone:

E-Mail:

L) Selection Process Used☒ Competitive Solicitation Solicitation #: GFO-20-605☐ First Come First Served Solicitation Solicitation #: - -**M) The following items should be attached to this GRF**

1. Exhibit A, Scope of Work

2. Exhibit B, Budget Detail

3. CEC 105, Questionnaire for Identifying Conflicts

4. Recipient Resolution

5. CEQA Documentation

☒ Attached☒ Attached☒ Attached☒ N/A☐ Attached☒ N/A☐ Attached_____
Agreement Manager_____
Date_____
Office Manager_____
Date_____
Deputy Director_____
Date

Exhibit A
SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		Administration
2		Infrastructure Design and Installation
3	X	Smart Charger Management and Optimization
4	X	VGI Business Model Validation and Demand Response Program Integration
5		Smart Charger Training Design and Implementation
6		Knowledge Transfer
7		Project Fact Sheet
8		Data Collection and Analysis

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Muffi Ghadiali, Electriphi, Inc. (Electriphi) Wendy Zhao, Electriphi Ethan Lipman, Electriphi	N/A	N/A
2	Ethan Lipman, Electriphi Steve Bloch, TBD	TBD	Twin Rivers Unified School District (TRUSD)
3	Muffi Ghadiali, Electriphi Sanjay Dayal, Electriphi	N/A	TRUSD, Sacramento Municipal Utility District (SMUD)
4	Ross Kiddie, Cadmus Michelle Levinson, Cadmus	Cadmus	SMUD
5	Muffi Ghadiali, Electriphi Wendy Zhao, Electriphi	N/A	TRUSD
6	Muffi Ghadiali, Electriphi Wendy Zhao, Electriphi	Electriphi, Inc.	TRUSD, SMUD
7	TBD	N/A	N/A

8	Ross Kiddie, Cadmus Michelle Levinson, Cadmus Muffi Ghadiali, Electriphi Sanjay Dayal, Electriphi Wendy Zhao, Electriphi	Cadmus	TRUSD
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GLOSSARY

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

Term/ Acronym	Definition
ADR	Automated Demand Response
CAM	Commission Agreement Manager
Clean Transportation Program	Formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program
CPR	Critical Project Review
DR	Demand Response
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FTD	Fuels and Transportation Division
GHG	Greenhouse Gas
Recipient	Electriphi, Inc.
SC	Smart Charging
SMUD	Sacramento Municipal Utility District
TRUSD	Twin Rivers Unified School District
VGI	Vehicle Grid Integration
VPP	Virtual Power Plant
V1G	Uni-directional energy flow
V2G	Bi-directional energy flow

BACKGROUND

Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007), created the Clean Transportation Program (formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program). The statute authorizes the California Energy

Commission (CEC) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. AB 8 (Perea, Chapter 401, Statutes of 2013) re-authorizes the Program through January 1, 2024, and specifies that the CEC allocate up to \$20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational. The Clean Transportation Program has an annual budget of approximately \$100 million and provides financial support for projects that:

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

The CEC issued GFO-20-605 entitled "BESTFIT Innovative Charging Solutions," under the CEC's Clean Transportation Program. To be eligible for funding under GFO-20-605, projects must also be consistent with the CEC's current Clean Transportation Program Investment Plan, updated annually. In response to GFO-20-605, the Recipient submitted Proposal #9 which was proposed for funding in the CEC's Notice of Proposed Awards on April 16, 2021. GFO-20-605 and Recipient's aforementioned proposal is hereby incorporated by reference into this Agreement in their entirety.

In the event of any conflict or inconsistency between the terms of the Solicitation and the terms of the Recipient's Application, the Solicitation shall control. Similarly, in the event of any conflict or inconsistency between the terms of this Agreement and the terms of the Recipient's Application, the terms of this Agreement shall control.

Problem Statement

To address the twin challenges of toxic air pollution and climate disruption, fleet operators urgently need access to electric mobility solutions that are economically efficient and rapidly scalable, without over-burdening the electric grid. Schools, in particular, have a special need for accelerating fleet electrification given that young people are uniquely vulnerable to toxic air emissions. However, the high cost of charging infrastructure—along with uncertainties regarding future energy costs—are impeding rapid adoption of electric vehicles (EV) by fleet operators generally and schools in particular.

To address these barriers, the Recipient will demonstrate an innovative smart charging (SC) platform, integrated with utility demand response (DR) and distributed energy resource management systems, that will substantially lower electric fleet operational and infrastructure costs. This platform will demonstrate a price/performance breakthrough on the all-in costs of EV fleet infrastructure and charging -- and thereby accelerate adoption of EVs by schools and other fleet operators across California and beyond.

Goals of the Agreement

The goals of this Agreement are to:

- Deploy SC capable infrastructure at Twin Rivers Unified School District (TRUSD).
- Optimize smart charge management to demonstrate significant savings in fleet operating and capital costs and greenhouse gas (GHG) emissions.
- Demonstrate capability for electric school buses to provide a broad range of grid services while supporting regular fleet operations.
- Evaluate and quantify the business case for vehicle-to-grid power flow in an electric school bus fleet.
- Validate the business model for vehicle-to-grid power flow in an electric school bus fleet.
- Simplify SC interoperability via a unified control platform.
- Disseminate project data, economics models, results, and lessons learned to accelerate deployment of electric fleets and SC management solutions.
- Demonstrate utility dynamic response technology using open standards to enable scaled deployment of managed charging to diverse load serving entities.
- Disseminate project data, results, and lessons learned to accelerate deployment of electric fleets and SC management solutions

Objectives of the Agreement:

The objectives of this Agreement are to:

- Deploy a minimum of 20 direct current (DC) fast chargers and needed infrastructure across two sites (panel, breakers, switchgear, trenching, conduit etc.) to support SC at TRUSD.
- Demonstrate energy cost reduction of up to 40 percent or more and average savings of up to 6 cents/kWh relative to unmanaged charging solutions without impairing fleet readiness.
- Reduce peak load to enable charging to up to three times more fleet vehicles (without incurring infrastructure upgrades) vs. unmanaged charging.

- Demonstrate capital cost savings of up to 30 percent or more over unmanaged charging solutions in aggregated electric service upgrade cost and charging infrastructure cost.
- Reduce transformer capacity requirements by up to 40 percent or more vs. unmanaged charging relative to the same fleet size.
- Support single transformer service of up to 150 EVs in the managed charging scenario vs. 50 EVs in the unmanaged scenario.
- Demonstrate GHG reduction of 41 kg of CO₂e per dollar of investment.¹
- Demonstrate use of SC management for at least the following grid service types: a) demand response; b) peak load shifting; and c) peak load reduction.
- Demonstrate electric bus “uptime” equivalent to or better than legacy diesel buses.
- Demonstrate average electric bus operational costs (including energy, maintenance, and repair) equivalent to or better than current internal combustion engine (ICE) buses in \$/mile.
- Evaluate and quantify Vehicle-to-Grid (V2G) power flow for purposes of: a) business model and monetization modelling; b) ESB resiliency; and 3) grid services.
- Estimate available kWh per year of V2G energy discharge to the grid per vehicle per year maintaining current fleet serviceability.
- Integrate (Electric Vehicle Supply Equipment) EVSE from at least three infrastructure vendors.
- Integrate at least three EV types (electric school buses, light-duty vehicles, and medium-duty trucks).
- Provide centralized software control of V1G charging modes with utility demand response programs.
- Demonstrate use of Open Automated Demand Response 2.0b VEN (Open ADR) in real-world program operations with Sacramento Municipal Utility District (SMUD).
- Through software simulation, model the results of ADR for electric bus fleets, including uni-directional and bi-directional energy flow in at least four other electric service territories (PG&E, SCE, SDG&E, MCE), to demonstrate aggregate load shift/shed potential.

¹ Basis of estimate is as follows: 30 month project lifecycle; 23,000 MT of CO₂ reduction per year for E-Buses vs. fossil fueled buses; 57,500 MT of CO₂ over 30 months. \$1.4M CEC investment over 30 months; 41kg of CO₂ per CEC\$ -- (57500/\$1.4M = .041 MT/\$)

- Develop and disseminate Twin Rivers / SMUD Fleet Electrification & Smart Management Case Study to communicate project data, results, and lessons learned.
- Develop and deliver School Bus Fleet Electrification webinars addressing SC management and grid integration to engage at least 50 Districts and 5 Load-Serving Entities.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement. The Commission Agreement Manager (CAM) shall designate the date and location of this meeting and provide an agenda to the Recipient prior to the meeting.

The Recipient shall:

- Attend a “Kick-Off” meeting with the CAM, the Commission Agreement Officer (CAO), and a representative of the CEC Accounting Office. The Recipient shall bring their Project Manager, Agreement Administrator, Accounting Officer, and any others determined necessary by the Recipient or specifically requested by the CAM to this meeting.
- Discuss the following administrative and technical aspects of this Agreement:
 - Agreement Terms and Conditions
 - Critical Project Review (Task 1.2)
 - Match fund documentation (Task 1.6) No reimbursable work may be done until this documentation is in place.
 - Permit documentation (Task 1.7)
 - Subcontracts needed to carry out project (Task 1.8)
 - The CAM’s expectations for accomplishing tasks described in the Scope of Work
 - An updated Schedule of Products and Due Dates
 - Monthly Progress Reports (Task 1.4)
 - Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
 - Final Report (Task 1.5)

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds

- Updated List of Permits

Commission Agreement Manager Product:

- Kick-Off Meeting Agenda

Task 1.2 Critical Project Review (CPR) Meetings

CPRs provide the opportunity for frank discussions between the CEC and the Recipient. The goal of this task is to determine if the project should continue to receive CEC funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

The CAM may schedule CPR meetings as necessary, and meeting costs will be borne by the Recipient.

Meeting participants include the CAM and the Recipient and may include the CAO, the Fuels and Transportation Division (FTD) program lead, other CEC staff and Management as well as other individuals selected by the CAM to provide support to the Energy Commission.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the CEC, but they may take place at another location or remotely.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. Prepare a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see section 8 of the Terms and Conditions). If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Lead Commissioner for Transportation for his or her concurrence.
- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the CAM and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

CAM Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with CEC staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the Commission Agreement Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Agreement Manager.

The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The CAM will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the CAM and the CAO about the following Agreement closeout items:

- What to do with any equipment purchased with CEC funds (Options)
- CEC's request for specific "generated" data (not already provided in Agreement products)

- Need to document Recipient's disclosure of "subject inventions" developed under the Agreement
- "Surviving" Agreement provisions
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the CAM within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Section 6 of the Terms and Conditions of this Agreement.
- In the first Monthly Progress Report and first invoice, document and verify match expenditures and provide a synopsis of project progress, if match funds have been expended or if work funded with match share has occurred after the notice of proposed award but before execution of the grant agreement. If no match funds have been expended or if no work funded with match share has occurred before execution, then state this in the report. All pre-execution match expenditures must conform to the requirements in the Terms and Conditions of this Agreement.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving the Agreement's goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements to the FTD project management processes.

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

The Recipient shall:

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the latest version of the Final Report guidelines which will be provided by the CAM. The CAM shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt.
- Complete and submit a Final Report, incorporating all comments from the CAM, in accordance with the currently approved Schedule of Products and Due Dates.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Outline of the Final Report
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the CEC budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of CEC funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the CAM at least 2 working days prior to the kick-off meeting. If no match funds were part of the proposal that led to the CEC awarding this Agreement and none have been identified at the time this Agreement starts, then state such 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 each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
 - Amount of each in-kind contribution, a description, documented market or book value, and its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the CAM if during the course of the Agreement additional match funds are received.
- Notify the CAM within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR meeting.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. Although the CEC budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the CAM at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Commission Agreement Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Agreement Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- A copy of each approved permit (if applicable)

- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)
- A copy of each final approved permit (if applicable)

Task 1.8 Obtain and Execute Subcontracts

The goal of this task is to ensure quality products and to procure subcontractors required to carry out the tasks under this Agreement consistent with the Agreement Terms and Conditions and the Recipient's own procurement policies and procedures. It will also provide the CEC an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement, and that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Manage and coordinate subcontractor activities.
- Submit a draft of each subcontract required to conduct the work under this Agreement to the CAM for review.
- Submit a final copy of the executed subcontract.
- If Recipient decides to add new subcontractors, then the Recipient shall notify the CAM.

Products:

- Letter describing the subcontracts needed, or stating that no subcontracts are required
- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 INFRASTRUCTURE DESIGN AND INSTALLATION

The goals of this task are to enable the project team to engineer, design, and install needed charging stations and related electrical equipment.

The Recipient shall:

- Develop a *Site Design Packet and Engineering Report* with the following potential elements:
 - General Site Plan and electrical sheets
 - Single Line Diagrams and Load Schedules
 - Electrical Site Plan
 - Civil Site Plan

- Demolition plan, as applicable should relocation or removal of existing components be required
- Structural detail sheets
- Provide a draft and final copy of the Site Design Packet and Engineering Report to the CAM.
- Submit to the CAM an AB 841 Certification that certifies the project has complied with all AB 841 (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 to the CAM EVITP Certification Numbers of each EV Infrastructure Training Program certified electrician that installed EV charging infrastructure or equipment. EVITP Certification Numbers are not required to be submitted if AB 841 requirements do not apply to the project.
- Deploy a minimum of 20 DC fast chargers at relevant TRUSD sites.
- Evaluate existing switchgear capacity and if needed perform installation of new Amp panel, main breaker and switchgear to serve 20 DC fast chargers.
- Perform installation of all above ground and trenched conduit, conductors, circuit breakers, grounding, and network communications, consistent with manufacturer requirements, all applicable codes and standards, and reasonable future proofing considerations.
- Install concrete footings as needed per charger installation configuration.
- As applicable, install concrete removable bollards to protect against bus collision with chargers.
- Develop an *Infrastructure Installation Report* that includes high-resolution photographs of final installations and that summarizes infrastructure deployments by site, capacity, public or private access level and final operational status.
- Provide a draft and final copy of the *Infrastructure Installation Report* to the CAM.

Products:

- Site Design Packet and Engineering Report (Draft and Final)
- AB 841 Certification and EVITP Certification Numbers
- Installation Report (Draft and Final)

TASK 3 SMART CHARGING MANAGEMENT AND OPTIMIZATION

The goals of this task are to demonstrate SC management in actual operations and develop simulated scenarios that realistically model the impact of SC in diverse fleet

configurations across multiple utility territories throughout California. Activities related to this task will demonstrate that the SC Management system will: enable fleet operators to charge more vehicles per dollar of total EV infrastructure investment and enable fleet and grid operators to manage more charging events within existing transformer limits, thereby extending transformer life and reducing ratepayer costs.

Task 3.1 TWIN RIVERS UNIFIED SCHOOL DISTRICT SMART CHARGING PLAN, IMPLEMENTATION, AND REPORT

The goal of this subtask is to develop and implement an artificial intelligence-enabled SC Plan for TRUSD.

The Recipient shall:

- Develop and implement a *SC Plan* for TRUSD. This plan will:
 - Define a SC strategy that modulates and optimizes charging based on factors that include (but are not limited to):
 - SMUD rates, which includes demand charges and TOU pricing.
 - Needed rates of charge to satisfy operational needs.
 - TRUSD fleet constraints (including but not limited to range requirements, state of charge needs, vehicle routes, and operational or maintenance schedules).
 - Enable the project team to integrate multiple EVSE systems (including legacy EVSEs installed at TRUSD).
- Provide a draft and final copy of the *SC Plan* to the CAM.
- Define interoperability guidelines across relevant EV and EV charging software and hardware systems required to enable SC capability.
- Implement the software-based charging strategy as defined in the SC Plan, including but not limited to these steps:
 - Compatibility assessment for charger – CMS communication
 - Assemble EVSE specification documents detailing communication protocols (Open Charge Point Protocol (OCPP) and/or other open standards-based protocols) between charger and charging management system (CMS).
 - Convert compatibility information into a functional specification used to design CMS network services.
 - Software design and development for V1G charging control
 - Leverage functional specifications from the compatibility assessment to create initial models and software system designs.

- Test software code internally for compliance and performance.
- Lab testing with EVSE for operational and SC control
 - Conduct integration tests on sandboxed chargers to verify network-controlled charging management including remote start and stop, charging rate throttling, setting charging profiles, obtaining meter values, and monitoring charger status remotely.
- Activation of software SC control
 - Upon successful completion of lab testing, enable data monitoring on chargers at TRUSD site for up to 3 weeks.
 - Validate data flow between live charger and CMS prior to activating software charging management.
- Capture performance data in the *SC Report*.
- Provide a draft and final copy of the *SC Report* to the CAM.

Products:

- SC Plan (Draft and Final)
- SC Report (Draft and Final)

Task 3.2 SMART CHARGING SCENARIO MODEL

The goal of this task is to develop a SC model that can be adapted to diverse fleet configurations and California's multiple utility territories to determine optimum SC configurations. The model will be made publicly available and be accompanied by a user guide enabling configuration and use by fleet operators under diverse operating conditions and vehicle types.

The Recipient shall:

- Develop *SC Scenario Model and User Guide* presenting simulated scenarios that are the result of modeled impacts of SC in diverse fleet configurations and multiple utility territories throughout California. To develop this model, the Recipient shall:
 - Project typical bus fleet operator metrics and Key Performance Indicators (KPI) -- including routes, schedules, environmental conditions, energy usage, vehicles available and their energy usage, leveraging operational fleet and utility load data from Task 3.1 and 4.1.
 - Develop a user interface to simulate SC scenarios for fleets and visually guide users through model inputs and outputs, including electrification impact on fleet total cost of ownership and operations.
- Provide a copy of the *SC Scenario Model and User Guide* to the CAM.

Products:

- SC Scenario Model and User Guide (Draft and Final)

[CPR will be held in this task (See Task 1.2 for details)]

TASK 4 DEMAND RESPONSE PROGRAM INTEGRATION AND VGI BUSINESS MODEL ASSESSMENT

The goals of this task are to: 1) integrate the TRUSD fleet into the SMUD Demand Response program, in both V1G (unidirectional) and V2G (bidirectional) power flow configurations; and 2) assess and quantify the potential economic and environmental impacts of Vehicle Grid Integration (VGI) and Demand Response program participation for the TRUSD fleet.

Task 4.1 DEMAND RESPONSE PROGRAM INTEGRATION

The goal of this subtask is to integrate the TRUSD fleet with SMUD's existing and planned Demand Response programs, and to demonstrate the capability of the SC platform to optimize fleet and grid benefits.

The Recipient shall:

- Develop a *Demand Response Program Integration Plan* to demonstrate advanced charging management via operational integration of real-time Demand Response (DR) signals from the utility into the SC Platform thereby enabling utility-initiated load management.
- Provide a draft and final copy of the *Demand Response Program Integration Plan* to the CAM.
- Demonstrate use of communication protocols that may include DNP3 (SCADA), OpenADR 2.0b VEN, and the Simple Price API.
- Evaluate DR performance based on:
 - Effectiveness of utility-initiated load management based on utility energy and capacity cost savings.
 - Marginal utility emissions impact.
 - Customer bill impact, including peak shifting and shaving.
 - The ability to minimize operational impact due to DR events (as measured by fleet uptime and other fleet readiness metrics).
- Identify lessons learned relative to Vehicle-Grid Integration, DR program participation and participant satisfaction.
- Develop recommendations for DR program design suitable for diverse Load-Serving Entities and fleet operators.
- Develop a *Demand Response Program Integration Report* based on findings.

- Provide a draft and final copy of the *Demand Response Program Integration Report* to the CAM.

Products:

- Demand Response Program Integration Plan (Draft & Final)
- Demand Response Program Integration Report (Draft & Final)

Task 4.2 VGI BUSINESS MODEL ASSESSMENT

The goal of this subtask is to assess and quantify the value of VGI Use Cases at TRUSD and develop a recommended VGI approach based on the co-optimization of operational, economic, and environmental outcomes under current and expected regulatory regimes. The task will inform the cost-benefit analysis at TRUSD and result in an analytical model usable for future deployments at new sites. Based on the results of analysis the project team will provide recommendations regarding hardware and software required to support V2G (such as SCADA and non-export relays).

The Recipient shall:

- Evaluate and quantify Vehicle-to-Grid power flow impacts on utility and grid services, including:
 - KWh per year of V2G energy discharge to the grid per vehicle per year
 - Potential economic and emission impact of V2G power flow
- Evaluate Vehicle-to-Grid power flow impacts on TRUSD fleet operations, including:
 - Fleet vehicle technology readiness and reliability
 - Charger utilization
 - Energy costs and revenues
- Develop *VGI Valuation Model* that evaluates and quantifies the economic and environmental costs and benefits of VGI given grid, fleet, and technology conditions at TRUSD.
- Provide a draft and final copy of the *VGI Valuation Model* to the CAM.
- Develop a *VGI Use Case and Grid Services Challenges and Opportunities Report* that summarizes key analytical findings, including recommendations for optimizing fleet operations and VGI program outcomes.
- Provide a draft and final copy of the *VGI Use Case and Grid Services Challenges and Opportunities Report* to the CAM.

Products:

- VGI Valuation Model (Draft and Final)

- VGI Use Case and Grid Services Challenges and Opportunities Report (Draft and Final)

[CPR will be held in this task (See Task 1.2 for details)]

TASK 5 SMART CHARGING TRAINING DESIGN AND IMPLEMENTATION

The goals of this task are to train TRUSD operators in use of the e-fleet SC management software and optimize school electric fleet charging economy through operator training in and use of advanced analytics and behavior modification strategies.

Task 5.1 SMART CHARGING TRAINING DESIGN

The goal of this subtask is to develop the *SC Training Plan* to guide TRUSD fleet operators on optimization of SC.

The Recipient shall:

- Develop and implement a *SC Training Plan*. This guidance document will outline strategies and processes for:
 - Optimizing efficient electric school fleet charging.
 - Training fleet managers, drivers, and technicians in SC operations and utilization of the smart-charging software platform.
- Provide a draft and final copy of the *SC Training Plan* to the CAM.

Products:

- SC Training Plan (Draft and Final)

TASK 5.2 SMART CHARGING TRAINING IMPLEMENTATION

The goal of this subtask is to implement the SC Training Design, enabling users to effectively operate and maintain SC Management software and hardware components.

The Recipient shall:

- Host *SC Training Sessions* for each user role, including but not limited to drivers, maintenance technicians, and supervisors – to ensure end-user usage and comfort with the platform while enabling maximum utilization of available feature sets. Key features to be covered in the training include but are not limited to:
 - Pulling reports and data
 - Utilizing built-in analytics
 - Implementing fine grain controls of charging – including optimization of schedules and rates of charging
- Provide copies of the *User Training Sessions Agendas and Report* to the CAM.

Products:

- User Training Session Agendas and Report

Task 5.3 ONLINE OPERATOR KNOWLEDGE CENTER

The goal of this subtask is to develop an online Electric Fleet Charging Knowledge Center designed to connect TRUSD and other fleet operators to a documented knowledge base. The knowledge center will provide FAQs, technical, and troubleshooting guidance for common issues with electric fleet charging in general and SC systems operation in particular.

The Recipient shall:

- Develop an Online *Operator Knowledge Center* that will connect fleet operators with a searchable knowledge base to enable identification of known issues and provide FAQ, technical, and troubleshooting support. The Knowledge Center will include information on:
 - Charging management definitions
 - Common fleet use cases
 - Charging management operational instructions
 - Common challenges and how to address them
 - Test cases and troubleshooting guidelines
- Share the *Operator Knowledge Center* with the CAM.

Products:

- Operator Knowledge Center

Task 5.4 TECHNICIAN SUPPORT APPLICATION

The goal of this subtask is to develop an application that offers SC field support to fleet technicians and charging infrastructure suppliers. Leveraging OEM maintenance documentation, the application will provide field service technicians with the information they need for in field rapid response that reduces operational costs and supports enhanced fleet uptime.

The Recipient shall:

- Develop *Technician Support Application* for technicians with these key features:
 - Enable alerts of SC operational status including fault notifications.
 - Explain error codes and source origin.
 - Provide OEM supplied resolution instructions that service technicians can use to facilitate efficient repair or replacement of key components.
 - Provide direct access to on-call advanced support.

- Provide real time tracking and feedback on service status from the fleet management dashboard.
- Share the *Technician Support Application* with the CAM.

Products:

- Technician Support Application

Task 5.5 OPERATOR TRAINING REPORT

The goal of this subtask is to develop an operator training report highlighting key results of the SC Training initiative.

The Recipient shall:

- Develop the *Operator Training Report* highlighting results of the training program. Include a summary of program design and messaging strategies that engage and encourage optimized charging management.
- Provide a draft and final copy of the *Operator Training Report* to the CAM.

Products:

- Operator Training Report (Draft and Final)

TASK 6 KNOWLEDGE TRANSFER

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

Task 6.1 OUTREACH AND ENGAGEMENT

The goal of this subtask is to facilitate engagement of key project stakeholders.

The Recipient Shall:

- Develop an *Outreach and Engagement Plan* that includes an explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector (fleet operators) and potential outreach to end users, utilities, regulatory agencies, and others. Key Plan elements may include, but are not limited to:
 - A description of the intended use(s) for and users of the project results
 - Published documents, including date, title, and periodical name
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination (These documents will include the Legal Notice required in the terms and conditions and indicate where and when the documents were disseminated.)

- A discussion of policy developments -- stating if the project has been or will be cited in government policy publications, or used to inform regulatory bodies
- Additional areas as determined by the CAM
- Provide a draft and final copy of the *Outreach and Engagement Plan* to the CAM.
- Develop School Bus Fleet Electrification webinar addressing SC management and grid integration to engage at least 50 school districts and five Load-Serving Entities.
- Provide a copy of *School Fleet Electric Charging Optimization Webinar materials* to the CAM.
- Develop the *Outreach and Engagement Report* designed to summarize the results of outreach and engagement, highlight key events, and describe the results of stakeholder engagement.
- Provide a draft and final copy of the *Outreach and Engagement Report* to the CAM.

Products:

- Outreach and Engagement Plan (Draft and Final)
- School Fleet Electric Charging Optimization Webinar materials
- Outreach and Engagement Report (Draft and Final)

Task 6.2 SMART CHARGING MANAGEMENT CASE STUDY

The goal of this subtask is to develop a case study highlighting the outcomes of the project that can be distributed to other school district fleet operators considering fleet electrification and the adoption of SC technologies.

The Recipient shall:

- Develop the *TRUSD and SMUD Fleet Electrification SC Management Case Study* to communicate project data, results, and lessons learned – with emphasis on operating and capital cost savings, grid services and support, and stakeholder benefits.
- Distribute the *Case Study* via at least three key partner websites (e.g., California Association of School Business Officers, CALSTART, and the California Association of School Transportation Officers).
- Provide a draft and final copy of the *Case Study* to the CAM.

Products:

- TRUSD and SMUD Fleet Electrification SC Management Case Study (Draft and Final)

TASK 7 PROJECT FACT SHEET

The goal of this task is to develop an initial and final project fact sheet that describes the CEC-funded project and the benefits resulting from the project for the public and key decision makers.

The Recipient shall:

- Prepare an Initial Project Fact Sheet at start of the project that describes the project and the expected benefits. Use the format provided by the CAM.
- Prepare a Final Project Fact Sheet at the project's conclusion that describes the project, the actual benefits resulting from the project, and lessons learned from implementing the project. Use the format provided by the CAM.
- Provide at least (6) six High Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) from the project.

Products:

- Initial Project Fact Sheet
- Final Project Fact Sheet
- High Quality Digital Photographs

TASK 8 DATA COLLECTION AND ANALYSIS

The goal of this task is to collect operational data from the project, to analyze that data for economic and environmental impacts, and to include the data and analysis in the Final Report.

The Recipient shall:

- Develop data collection test plan for deployed charging equipment.
- Troubleshoot any issues identified.
- Collect a minimum of 12 months of data on charging events for the deployed infrastructure including, but not limited to:
 - Charge and session duration
 - Energy delivered (kWh)
 - Peak power delivered (kW)
 - Applicable price for charging, including but not limited to: electric utility tariff, EVSP service contract, or public charger price
 - Payment method
 - Types of vehicles using the charging equipment
 - Number of unique vehicles and frequency of "repeat vehicles"

- Energy delivered back to grid or facility if a bidirectional charging use case (kWh)
- Submit the data described above electronically in a monthly progress report throughout the duration of the data collection period.
- Develop a plan to provide other relevant data and information throughout the duration of the funding agreement including, but not limited to:
 - Lessons learned
 - Best practices (e.g., permitting and installation processes)
 - Job creation
 - Economic development
 - Increased state revenue
- Submit the data described above electronically in a quarterly progress report throughout the duration of the agreement.
- Identify any planned use of renewable energy in the project.
- Compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments.
- Collect data, information, and analysis described above and include in the Final Report.

Products:

- Data collection on charging events will be submitted electronically in a monthly progress report.
- Data collection on other relevant data and information described above will be submitted electronically in a quarterly progress report.
- Data collection information and analysis will be included in the Final Report.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: ELECTRI PHI, 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 ARV-21-043 with Electriphi, Inc. for a \$1,450,983 grant to demonstrate the potential for accelerated commercial deployment of an advanced utility and grid-integrated smart charging management system in the context of a large and diverse school fleet; 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 November 15, 2021.

AYE:

NAY:

ABSENT:

ABSTAIN:

Liza Lopez
Secretariat