California Energy Commission
September 10, 2025 Business Meeting
Backup Materials for Lucid Group, Inc.

The following backup materials for the above-referenced agenda item are available in this PDF packet as listed below:

1. Proposed Resolution
2. Grant Request Form
3. Scope of Work

[PROPOSED]

RESOLUTION NO: 25-0910-XX

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: Lucid Group, 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-25-013 with Lucid Group, Inc. for a $2,699,520 grant. This project will take place in Alameda County and develop the Lucid Electric Advanced Platform-V2X (LEAP-V2X), a cost-effective alternating current bidirectional on-board charging system to support more widespread adoption of bidirectional-capable EVs; 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 10, 2025.

AYE:
NAY:
ABSENT:
ABSTAIN:

Dated:

_____
Kim Todd
Secretariat

STATE OF CALIFORNIA
CALIFORNIA ENERGY COMMISSION

CEC-270 (Revised 01/2024)

GRANT REQUEST FORM (GRF)

A. New Agreement Number

IMPORTANT: New Agreement # to be completed by Contracts, Grants, and Loans Office.

New Agreement Number: EPC-25-013

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Antonio Gomez
3. MS-:51
4. Phone Number: 916-232-9188

C. Recipient's Information

1. Recipient's Legal Name: Lucid Group, Inc.
2. Federal ID Number: 26-1618465

D. Title of Project

Title of project: Next Gen LEAP (Lucid Electric Advanced Platform)-V2X

E. Term and Amount

1. Start Date: 9/15/2025
2. End Date: 3/31/2029
3. Amount: $2,699,520.00

F. Business Meeting Information

1. Are the ARFVTP agreements $75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 9/10/2025 .
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Antonio Gomez
5. Time Needed for Business Meeting: 5 minutes.
6. The email subscription topic is: Electric Program Investment Charge (EPIC)

Agenda Item Subject and Description:

Lucid Group, Inc. Proposed resolution approving agreement EPC-25-013 with Lucid Group, Inc. for a $2,699,520 grant and adopting staff's recommendation that this action is exempt from CEQA. This project, taking place in Alameda County, will develop the Lucid Electric Advanced Platform-V2X (LEAP-V2X): a cost-effective alternating current bidirectional on-board charging system to support more widespread adoption of bidirectional-capable EVs.

G. California Environmental Quality Act (CEQA) Compliance

1. **Is Agreement considered a "Project" under CEQA?**
   Yes

   If yes, skip to question 2.

   If no, complete the following (PRC 21065 and 14 CCR 15378) and 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 answer the following questions.**

a) Agreement **IS** exempt?

Yes

Statutory Exemption?
No

If yes, list PRC and/or CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

PRC section number: None

CCR section number: None

Categorical Exemption?
Yes

If yes, list CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

CCR section number: Cal. Code Regs., tit. 14, § 15301 ;

Common Sense Exemption? 14 CCR 15061 (b) (3)
No

If yes, explain reason why Agreement is exempt under the above section. If no, enter "Not applicable" and go to the next 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. This project will be conducted at Recipient's existing headquarters facility, which has the necessary equipment, space, and personnel to conduct all proposed activities. The areas on the existing facility that are affected by the proposed project have already been graded, disturbed, paved, and have structures constructed. The development and demonstration of the LEAP-V2X will take place in Recipient's existing research facilities and will not require any material changes to their site. The project activities involve negligible or no expansion of existing or former use and will not have a significant effect on the environment. For these reasons, the proposed work fits within section 15301.

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 sites are 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.

b) Agreement **IS NOT** exempt.
IMPORTANT: consult with the legal office to determine next steps.

No

If yes, answer yes or no to all that applies. If no, list all as "no" and "None" as "yes".

Additional Documents	Applies
Initial Study	No
Negative Declaration	No
Mitigated Negative Declaration	No
Environmental Impact Report	No
Statement of Overriding Considerations	No
None	Yes

H. Is this project considered "Infrastructure"?

No

I. Subcontractors

List all Subcontractors listed in the Budget (s) (major and minor). Insert additional rows if needed. If no subcontractors to report, enter "No subcontractors to report" and "0" to funds. **Delete** any unused rows from the table.

Subcontractor Legal Company Name	CEC Funds	Match Funds
No subcontractors to report	$	**$**

J. Vendors and Sellers for Equipment and Materials/Miscellaneous

List all Vendors and Sellers listed in Budget(s) for Equipment and Materials/Miscellaneous. Insert additional rows if needed. If no vendors or sellers to report, enter "No vendors or sellers to report" and "0" to funds. **Delete** any unused rows from the table.

Vendor/Seller Legal Company Name	CEC Funds	Match Funds
No vendors to report	**$**	**$**

K. Key Partners

List all key partner(s). Insert additional rows if needed. If no key partners to report, enter "No key partners to report." **Delete** any unused rows from the table.

Key Partner Legal Company Name
No key partners to report

L. Budget Information

Include all budget information. Insert additional rows if needed. If no budget information to report, enter "N/A" for "Not Applicable" and "0" to Amount. **Delete** any unused rows from the table.

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	24-25	301.001L	$ 2,699,520

TOTAL Amount: $ 2,699,520

R&D Program Area: ESB: Transportation

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: 101

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Antony Martin

Address: 7373 Gateway Blvd

City, State, Zip: Newark, CA 94560-1149

Phone: 313-870-7394

E-Mail: antonymartin@lucidmotors.com

2. Recipient's Project Manager

Name: Antony Martin

Address: 7373 Gateway Blvd

City, State, Zip: Newark, CA 94560-1149

Phone: 313-870-7394

E-Mail: antonymartin@lucidmotors.com

N. Selection Process Used

There are three types of selection process. List the one used for this GRF.

Selection Process	Additional Information
Competitive Solicitation #	GFO-24-302
First Come First Served Solicitation #	Not applicable
Other	Not applicable

O. Attached Items

1. List all items that should be attached to this GRF by entering “Yes” or “No”.

Item Number	Item Name	Attached
1	Exhibit A, Scope of Work/Schedule	Yes
2	Exhibit B, Budget Detail	Yes
3	CEC 105, Questionnaire for Identifying Conflicts	Yes
4	Recipient Resolution	No
5	Awardee CEQA Documentation	Yes

Approved By

Individuals who approve this form must enter their full name and approval date in the MS Word version.

Agreement Manager: Antonio Gomez

Approval Date: 07/29/2025

Branch Manager: Reynaldo Gonzalez

Approval Date: 07/29/2025

Director: Reynaldo Gonzalez for Jonah Steinbuck

Approval Date: 07/29/2025

Exhibit A
Scope of Work
Lucid Group, Inc.

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	X	Development of SiC based LEAP Hardware Prototype
3	X	Development of GaN based LEAP Hardware Prototype
4	X	V2V testing under DC Coupling
5		V2H, V2G and V2L testing under Various Cases
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AC	Alternating Current
BOM	Bill of Materials
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CP	Control Pilot
CPR	Critical Project Review
DAB	Dual active bridge
DC	Direct Current
DER	Distributed Energy Resource
ELRP	Emergency Load Reduction Program
EMI	Electromagnetic interference
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
G2V	Grid-to-Vehicle
GaN	Gallium Nitride
LIN	Local interconnect network
LEAP	Lucid Electric Advanced Platform
LRA	Locked Rotor Amperage
MOSFET	Metal oxide field effect transistor
NFT	Neutral forming transformer
OBC	On-board charger
PF	Power factor
PV	Photovoltaic
SiC	Silicon-Carbide
TAC	Technical Advisory Committee
THD	Total harmonic distortion
V2L	Vehicle-to-Load

[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.

Acronym/Term	Meaning
AC	Alternating Current
V2H	Vehicle-to-Home
V2X	Vehicle-to-everything
V2G	Vehicle-to-Grid
V2V	Vehicle-to-Vehicle
DER	Distributed Energy Resource
VGI	Vehicle Grid Integration
VRMS	Root mean squared voltage

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the development and implementation of the Lucid Electric Advanced Platform-V2X (LEAP-V2X), a cost-effective alternating current (AC) bidirectional on-board charging system. LEAP-V2X will build on existing onboard charger technology and result in reduced hardware costs, enhanced functionality, improved efficiency, and increased accessibility of V2X technology.

B. Problem/ Solution Statement

Problem

V2X technology has the potential to enable EVs to discharge power in a variety of use cases that contribute to grid reliability, demand flexibility, and customer resilience. However, the adoption of V2X technology is limited by the high cost and complexity of enabling hardware such as bidirectional onboard chargers, making V2X inaccessible to many consumers, especially low-income families and residents of disadvantaged communities. With over 2 million EVs sold in California and projections of up to 15 million by 2035, EVs represent a vast, underutilized energy resource that could enhance grid stability, reduce greenhouse gas emissions, and promote energy equity. Addressing these issues now is crucial to leverage the growing number of EVs.

Solution

The Recipient aims to address the cost and complexity barriers of V2X technology by developing a cost-effective AC bidirectional onboard charging system and advancing V2X capabilities. Here are the key components of the solution:

1. **Cost-Effective AC Bidirectional Charging System**: Develop and optimize an AC bidirectional onboard charger that reduces the need for additional components like dual inverters. This simplification will cut costs, enhance reliability, and improve efficiency.
2. **Advanced V2X Capabilities**: Enhance V2X functionalities, including Vehicle-to-Grid (V2G), Vehicle-to-Home (V2H), Vehicle-to-Load (V2L), and Vehicle-to-Vehicle (V2V). This will enable EVs to interact more effectively with the grid, homes, other vehicles, and various loads, maximizing their utility as distributed energy resources (DERs).

3. **Technical Innovations**: Optimizing power electronics components, utilizing Gallium Nitride (GaN) devices for higher frequency conversion, and developing a vertically integrated solution. These innovations will reduce the size and cost of onboard chargers, making V2X technology more accessible.
4. **Standardization and Software Advancements**: Drive standardization of interfaces and protocols to reduce development costs and enable wider adoption of V2X. Additionally, the project will develop sophisticated control algorithms to maximize efficiency and lifespan.
5. **Integration into Next-Generation Vehicles**: Integrate the developed V2X technology into the Recipient's next-generation vehicles. This will ensure that the technology is ready for widespread adoption and can deliver tangible benefits to users.

By implementing these solutions, the project will make V2X technology more affordable and accessible, promoting energy equity and enhancing the value of DERs for both customers and the grid.

C. Goals and Objectives of the Agreement

Agreement Goals
The goals of this Agreement are to:

- Develop an AC bidirectional onboard charger that can help enable widespread V2X by lowering cost and complexity.
- Enhance V2X functionalities, including V2G, V2H, V2L, and V2V to maximize the utility of EVs as distributed energy resources.
- Ensure that the developed V2X technology is compliant with relevant safety, communications, and grid standards and ready for integration in Lucid's next-generation vehicles.

Ratepayer Benefits:[2]
This Agreement will result in ratepayer benefits including greater electricity reliability and lower costs:

Greater Electricity Reliability

- **EV-Powered Microgrids**: Transforming neighborhoods or homes into self-sustaining microgrids powered by V2X-enabled EVs enhances resilience during outages, ensuring a continuous power supply.
- **Dynamic Pricing Supercharged**: V2X-enabled EVs can respond to energy market fluctuations reflected in dynamic electricity price signals by supporting load shifts or exports that benefit grid efficiency and improve reliability.
- **Reduced Peak Demand**: V2X technology can reduce the need for "peaker plants" or distribution grid upgrades by using EVs as standby DERs that can be dispatched to reduce net peak demand.

[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).

Lower Costs

- **Reduced Infrastructure Costs**: EV managed charging lowers firm capacity needs and improves grid efficiency, deferring costly infrastructure upgrades and resulting in long-term cost savings for ratepayers. V2X expands on these benefits.
- **Lower Energy Bills**: Bidirectional charging technology allows EV owners to use their vehicles to power their homes during peak periods, leading to significant cost savings through off-peak charging and participation in programs like the Emergency Load Reduction Program (ELRP).

Technological Advancement and Breakthroughs:[3]

This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by advancing the following innovations, which will reduce the costs of onboard bidirectional charger technology and enable EVs to function as DERs to benefit customers and the grid.

1. Enabling AC/DC or DC/DC operation: For direct current (DC) loads such as an EV, direct DC capability *(no conversion to an intermediate AC-bus)* eliminates the dual conversion need, resulting in efficient power transfer.
2. Single-stage topology removes the need for electrolytic capacitors which have a limited lifespan thereby increasing the life of the product, saving the replacement and labor cost.
3. Develop LEAP-V2X technology using GaN devices as they are projected to cost less compared to Silicon-Carbide (SiC) devices due to well-established silicon wafers industry.
4. LEAP-V2X Bidirectional power flow capable on-board charger (OBC) with three-modules to support split phase 240 V and single phase 120 V.

Agreement Objectives

The objectives of this Agreement are to:

1. **Develop and Optimize a Cost-Effective AC Bidirectional Onboard Charging System**: Utilize topologies that reduce the bill of materials (BOM) cost and increase system efficiency, such as single-stage designs. Compare these topologies in terms of power rating, efficiency, cost, and volume.
2. **Advance V2X Capabilities**: Develop AC/DC-coupled V2X capability without additional AC/DC conversion, enabling efficient power conversion for various applications, including supplying DC loads and sourcing power from photovoltaic (PV) panels or other EVs.
3. **Enable Bidirectional Power Flow at 11 kW**: Scale the power to what is typically used by customers, ensuring cost-effectiveness and efficiency.
4. **Implement Precise Software Control Algorithms**: Optimize power utilization across all V2X features using algorithms such as zero voltage switching, zero current switching, and Deadband control.

[3] California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

5. **Design the On-Board Charger (OBC) for V2H Capability**: Generate neutral line voltage for split-phase systems, eliminating the need for external Neutral Forming Transformer (NFT) devices and driving cost efficiency.
6. **Standardize Communication Protocols**: Implement Local Interconnect Network (LIN) over frequency-based Control Pilot (CP) for V2X applications to reduce wiring complexity and improve charging efficiency. *Note: Though Lucid is committed to adopting industry standards for commercialization,the focus of this project is on the cost and performance optimization of the LEAP-V2X hardware and its functional safety.*
7. **Leverage Next-Generation Power-Electronics Devices**: Utilize GaN devices for higher switching frequency, resulting in lower mass components, lower cost, and higher power density. Target a volumetric density greater than 1.4kW/L and weight density greater than 1.5 kW/kg.
8. **Integrate V2X Components into the Onboard Charger**: Develop a vertically integrated solution that reduces installation costs and optimizes system efficiency by integrating essential V2X components directly into the onboard charger. Target a peak efficiency greater than or equal to 98% and cost estimate less than 2¢/W.

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.

  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, and other CEC staff relevant to the Agreement. The Recipient's Project Manager and any other individuals deemed necessary by the CAM or the Project Manager shall participate in 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., Teams, Zoom), with approval of the CAM.

  The Kick-off meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Travel;
  - Equipment purchases;
  - Administrative and Technical products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Monthly Calls (subtask 1.5)
  - Quarterly Progress reports (subtask 1.6)
  - Final Report (subtask 1.7)
  - Match funds (subtask 1.8);
  - Permit documentation (subtask 1.9);
  - Subawards(subtask 1.10);
  - Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
  - Agreement changes;
  - Performance Evaluations; 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 may be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., Teams) 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 may 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. A determination of unsatisfactory progress This may result in project delays, including a potential Stop Work Order, while the CEC determines whether the project should continue.
- 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., Teams~~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 of the following Agreement closeout items:
    - Disposition of any procured equipment.
    - The CEC's request for specific "generated" data (not already provided in Agreement products).
    - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
    - "Surviving" Agreement provisions such as repayment provisions and confidential products.
    - 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* organized by the tasks in the Agreement.

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

MONTHLY CALLS, REPORTS AND INVOICES

Subtask 1.5 Monthly Calls
The goal of this task is to have calls at least monthly between the CAM and Recipient to 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 verbally 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, to verify match funds are being proportionally spent concurrently or in advance of CEC funds or are being spent in accordance with an approved Match Funding Spending Plan, to form the basis for determining whether invoices are consistent with work performed, and to answer any other questions from the CAM. Monthly calls might not be held on those months when a quarterly progress report is submitted or the CAM determines that a monthly call is unnecessary.

The CAM shall:

- Schedule monthly calls.
- Provide questions to the Recipient prior to the monthly call.
- Provide call summary notes to Recipient of items discussed during call.

The Recipient shall:

- Review the questions provided by CAM prior to the monthly call
- Provide verbal answers to the CAM during the call.

Product:

- Email to CAM concurring with call summary notes.

Subtask 1.6 Quarterly 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 *Quarterly 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 reporting period, 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. Progress reports are due to the CAM the 10th day of each January, April, July, and October. The Quarterly Progress Report template can be found on the ECAMS Resources webpage available at: https://www.energy.ca.gov/media/4691
- Submit a monthly or quarterly *Invoice* on the invoice template(s) provided by the CAM.

Recipient Products:

- Quarterly Progress Reports
- Invoices

CAM Product:

- Invoice template

Subtask 1.7 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement.

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

Subtask 1.7.1 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 Products:

- Energy Commission Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.7.2 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 on Draft Final Report* received on the Executive Summary. For each comment received, the Recipient will identify in the summary the following:
  - Comments the Recipient proposes to incorporate.
  - Comments the Recipient does propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any

comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:
- Summary of TAC Comments on Draft Final Report
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- Final Report

CAM Product:
- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBAWARDS

Subtask 1.8 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. 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 application 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 application that led to the CEC awarding this Agreement, then provide in the letter a list of the match funds that identifies:
  - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
  - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
  - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.

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

Products:

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

Subtask 1.9 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 1.10 Obtain and Execute Subawards and Agreements with Site Hosts

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

The Recipient shall:

- Execute and manage subawards and coordinate subrecipients activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subaward.
- Include any required Energy Commission flow-down provisions in each subaward, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subaward terms.
- Submit a *Subaward and Site Letter* to the CAM describing the subawards and any site host agreement needed or stating that no subawards or site host agreements are required.
- If requested by the CAM, submit a draft of each *Subaward* and any *Site Host Agreement* required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed *Subaward* and any *Site Host Agreement*.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding of subrecipient additions in the terms and conditions).

Products:

- Subawards
- Draft Subawards *(if requested by the CAM)*
- Draft Site Host Agreement *(if requested by the CAM)*
- Final Subawards *(if requested by the CAM)*
- Final Site Host Agreement *(if requested by the CAM)*

TECHNICAL ADVISORY COMMITTEE

Subtask 1.11 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 ensure a long-term perspective on decision-making and progress toward the project's strategic goals.

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

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- 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 1.12.
- 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 1.12 TAC Meetings

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

The Recipient shall:

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

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its 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 ensure 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 1.13 Project Performance Metrics

The goal of this subtask is to finalize key performance targets for the project 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 section of 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

IV. TECHNICAL TASKS

TASK 2: DEVELOPMENT OF SIC BASED LEAP HARDWARE PROTOTYPE

The goal is to develop a high-efficiency low-cost single-stage LEAP prototype based on SiC switches. With this prototype, the single stage solution will be validated along a performance matrix to compare it with solutions from other competitors.

The Recipient shall:

- Develop a simulation of the LEAP based on SiC device technology to validate the topology, modulation, and control. This involves:
    - SiC metal oxide field effect transistor (MOSFET) selection based on Double pulse test (switch characterization), thermal stackup study, and mass manufacturing cost study.
    - Study of dual active bridge (DAB) and resonant topologies converter for optimized modulation based on the selected SiC MOSFET.
        - Develop theoretical estimate on losses.
        - Design control architecture for the V2X and OBC operation.
    - Design and testing of magnetics components and estimation of losses in magnetics using software, such as ANSYS.
- Conduct an experimental test of the SiC based LEAP prototype. This involves:
    - Development of schematic design, layout design, component acquisition based on the BOM.
    - Building and testing the magnetic components.
    - Board population and functional test of the hardware prototype.
    - Perform open-loop and close-loop test for rectifier mode (charging mode).
    - Perform open-loop test for V2X (DC mode and AC mode).
    - Consolidate the efficiency, density, and other performance matrix data.
- Develop and test a second prototype, if needed, that incorporates required revisions.
- Prepare and submit an *SiC Based LEAP-V2X Performance Report (draft and final)* providing details on the simulation and experimental work. The report will include but will not be limited to the following results:

  - Efficiency versus load data for input voltage of 240 VRMS.
  - Power quality data (e.g. current total harmonic distortion (THD), power factor (PF), harmonics).
  - Electromagnetic interference (EMI) test results.
  - Electrical stability Grid-to-Vehicle (G2V) test results.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR meetings).
- Participate in a CPR meeting.

Products:
- SiC Based LEAP-V2X Performance Report (draft and final)
- CPR Report #1

TASK 3: DEVELOPMENT OF GAN BASED LEAP HARDWARE PROTOTYPE
The goal is to develop a denser and more cost effective single-stage LEAP prototype based on new bidirectional GaN based switches. With this prototype, the single stage solution will be validated along a performance matrix to compare it with the previous SiC based prototype.

The Recipient shall:
- Develop a simulation of the LEAP based on the monolithic bidirectional GaN switches technology to validate the topology, modulation, and control. This involves:
  - GaN based switches selection based on double pulse test (switch characterization), thermal stackup study, and mass manufacturing cost study.
  - Optimized modulation scheme development based on the selected GaN MOSFET.
    - Develop theoretical estimate on losses.
    - Design control architecture for the V2X and G2V operation.
  - Design and testing of magnetics components. Estimation of losses in magnetics using software, such as ANSYS.
- Conduct an experimental test of the GaN based LEAP prototype.
  - Development of schematic design, layout design, component acquisition based on the BOM.
  - Building and testing the magnetic components.
  - Board population and functional test of the hardware prototype.
  - Perform open-loop and close-loop test for rectifier mode (G2V mode).
  - Perform basic open-loop test for V2X (DC mode and AC mode).
  - Consolidate the efficiency, density, and other performance matrix data.
- Develop and test second prototype, if needed, that incorporates required revisions.
- Prepare and submit a *GaN based LEAP-V2X Performance Report (draft and final)* providing details on the simulation and experimental work. The report will include but not limited to the following results:
  - Efficiency versus load data for input voltage of 240 VRMS.
  - Power quality data (e.g. current THD, PF, harmonics).
  - EMI test results.
  - Electrical stability G2V test results.
  - Functional open loop test results for V2L AC (240 VRMS) and V2L DC (400 V) in open loop at 50% rated power (5.5 kW) and report the performance.
  - Lessons learned from the bidirectional GaN based LEAP tests.
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR meetings).

- Participate in a CPR meeting.

Products:
- GaN based LEAP-V2X Performance Report (draft and final)
- CPR Report #2

TASK 4: V2V TESTING UNDER DC COUPLING
The goal of this task is to develop and test the prototype, controls, and protocols to make the LEAP hardware capable of performing V2V-DC.

The Recipient shall:
- Integrate power stage with auxiliary communication circuits required and protection circuits for V2V operations outlined below.
- Build two (2) additional LEAP hardware prototypes to conduct the V2V test. Showcase the V2V DC on shared bus for multiple cars charging via LIN communication using a bench-level demonstration during site visit.
    - Develop the optimized modulation scheme for V2V DC.
    - Perform simulation and hardware test for V2V DC (1 to 1) at rated power of 11 kW.
    - Perform simulation and hardware test for V2V DC (2 to 1) at more than 11 kW to showcase faster charging capability.
- Prepare and submit a *V2V Operation Performance Report (draft and final)* providing details on the simulation and experimental work. The report will include but will not be limited to the test result on V2V DC testing:
    - Report the efficiency data for the two (2) cases under various load conditions.
    - Provide waveform showcasing the operation of V2V.
- Prepare a *CPR Report #3* in accordance with subtask 1.3 (CPR meetings).
- Participate in a CPR meeting.

Products:
- V2V Operation Performance Report (draft and final)
- CPR Report #3

TASK 5: V2H, V2G, AND V2L TESTING UNDER VARIOUS CASES
The goal of this task is to develop and test the prototype, controls, and protocols to make the LEAP hardware capable of performing V2H, V2L, and V2G task.

The Recipient shall:
- Conduct power flow tests on the LEAP hardware for various cases of V2X including V2H and V2L, while adhering to SAE Surface Vehicle Recommended Practice J3068.
- Through simulation, find optimal power flow scheme to accommodate the high Locked Rotor Amperage (LRA) that is typical for California homes.
- Prepare and submit a *V2X Operation Performance Report (draft and final)* providing the details on the V2X operation. The performance report will outline the following simulation and experimental results:

- In V2L/V2H AC mode: Load change, voltage regulation, THD <5%, surge withstand capability, EMI, current harmonics below standard.
- In V2L DC mode: Testing 20% to full load power ramp with fixed output voltage.
- Motor LRA test: Inrush current testing in V2L AC operation.
- Results on wide power factor handling capability as per UL 1741 Supplement A at rate power in V2G mode.
- Results on reactive power injection and absorption of 25% of rated power to the grid as per Institute of Electrical and Electronics Engineers Standard 1547-2018 in V2G mode.
- V2H and V2G mode operation of LEAP at rated power via EVSE.

Products:

- V2X Operation Performance Report (draft and final)

TASK 6: 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 January 31st of each year. The Annual Survey includes but is not limited to the following information:
  - Technology commercialization progress
  - 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), 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), 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 7: 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. Eligible activities include, but are not limited to, the following:

- Scale-up analysis including manufacturing analysis, independent design verification, and process improvement efforts.
- Technology verification testing, or application to a test bed program located in California.
- Legal services or licensing to secure necessary intellectual property to further develop the technology.
- Market research, business plan development, and cost-performance modeling.
- Entry into an incubator or accelerator program located in California.

The Recipient Shall:

- Develop and submit a *Technology Transfer Plan* that identifies the proposed activities the Recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the draft *Technology Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the Draft Technology Transfer Plan. This document will identify:
    - 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* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the Final Technology Transfer Plan. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for a CEC-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual 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 and final)
- Summary of TAC Comments
- Technology Transfer Summary Report (draft and final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.