California Energy Commission
October 08, 2025 Business Meeting
Backup Materials for Tandem PV, 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: 25-1008-XX

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: Tandem PV, 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-25-022 with Tandem PV, Inc. for a $3,975,954 grant. This project will fund the testing and validation of high-efficiency perovskite/silicon tandem photovoltaic panels in Fremont, Napa, San Diego, and Merced. Efforts include outdoor durability testing, accelerated indoor assessments, and standardized compliance testing to enhance technical bankability and support commercialization; and

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

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the CEC held on October 08, 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-25-022

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Michael Ferreira
3. MS-:51
4. Phone Number: 510-364-8808

C. Recipient's Information

1. Recipient's Legal Name: Tandem PV, Inc.
2. Federal ID Number: 81-2959567

D. Title of Project

Title of project: Establishing Technical Bankability of Perovskite/Silicon Tandem Panels through Comprehensive Durability Testing

E. Term and Amount

1. Start Date: 10/1/2025
2. End Date: 3/31/2030
3. Amount: $3,975,954.00

F. Business Meeting Information

1. Are the ARFVTP agreements $75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 10/8/2025 .
3. Consent or Discussion? Consent
4. Business Meeting Presenter Name: Lindsey Fransen
5. Time Needed for Business Meeting: 10 minutes.
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

Agenda Item Subject and Description:
Tandem PV, Inc. Proposed resolution approving agreement EPC-25-022 with Tandem PV, Inc. for a $3,975,954 grant, and adopting staff's recommendation that this action is exempt from CEQA. This agreement will fund the testing and validation of high-efficiency perovskite/silicon tandem photovoltaic panels in Fremont, Napa, San Diego, and Merced. Efforts include outdoor durability testing, accelerated indoor assessments, and standard compliance testing to enhance technical bankability and support commercialization. (EPIC funding) Contact: Ayat Osman

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 which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of use beyond that existing at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act. Work under this project will include: 1) outdoor field testing to establish long-term outdoor performance data for perovskite/silicon tandem modules, 2) indoor operational accelerated testing to understand the long-term behavior of perovskite/silicon tandem modules in a controlled environment under various applied stressors (e.g., light intensity, temperature, voltage), 3) standardized accelerated testing focused on evaluating the effectiveness of standardized accelerated testing in predicting both early-stage and long-term failure models for perovskite/silicon tandem modules, and 4) paper studies, modeling and laboratory research for perovskite/silicon tandem modules. All work and forms of testing including indoor and outdoor testing will occur at existing facilities with existing testing capabilities already in place. No new equipment will be installed and no alterations to any facilities will occur under this project. For these reasons, this project will have no impact on the environment and fits within section 15301.

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
The Regents of the University of California, on behalf of the San Diego Campus	$ 150,000	**$**0
The Regents of the University of California on behalf of the Merced Campus	$ 125,000	**$**0

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
D2Solar, LLC	$250,000	**$**0
PVEL, LLC	$400,000	**$**0
Vendors/Sellers of The Regents of the University of California, on behalf of the San Diego Campus		
TBD - Outdoor test platform for measurement and evaluation of tandem photovoltaic panels	*$10,000*	*$0*
Various – Lab Supplies	*$14,618*	*$0*
The Regents of the University of California, on behalf of the San Diego Campus (Misc. Costs)	*$11,922*	*$0*

Vendors/Sellers of The Regents of the University of California, on behalf of the Merced Campus		
TBD - Hardware for mounting and electrical connections	*$79*	*$0*
The Regents of the University of California, On behalf of the Merced Campus (Misc. Costs)	*$33,379*	*$0*

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	$ 3,975,954

TOTAL Amount: $ 3,975,954

R&D Program Area: TIEB: EDMF

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: 101

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Brianne Long

Address: 575 Dado St

City, State, Zip: San Jose, CA 95131-1207

Phone: 609-402-6545

E-Mail: brianne@tandempv.com

2. Recipient's Project Manager

Name: Colin Bailie

Address: 575 Dado St

City, State, Zip: San Jose, CA 95131-1207

Phone: 214-289-4070

E-Mail: cdbailie@tandempv.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-23-318
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	No

Approved By

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

Agreement Manager: Michael Ferreira

Approval Date: 8/20/2025

Branch Manager: Anthony Ng

Approval Date: 8/21/2025

Director: Jonah Steinbuck delegated to Branch Manager

Approval Date: 8/21/2025

Exhibit A
Scope of Work
Tandem PV, Inc

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	x	Outdoor Field Testing
3		Indoor Operational Accelerated Testing
4		Standardized Accelerated Testing
5		Evaluation of Project Benefits
6		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
BOS	Balance of system
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
CREATE	Creating Renewable Energy and Energy Efficiency Alternatives for Thermal and Electric Systems
DOE	US Department of Energy
LRIP	Low Rate Initial Production
LCOE	Levelized Cost of Energy
IEC	International Electrotechnical Commission
IEC 61646	A testing procedure by the International Electrotechnical Commission for accelerated testing of thin-film solar panels
IEC 61853-1	A testing procedure by the International Electrotechnical Commission for establishing solar panel performance at varying temperature and irradiance level
UL 61730-2	A testing procedure by Underwriters Laboratories to ensure safety of handling, installing, and operating solar panels
GHG	Greenhouse gases
IOU	Investor-owned utility
NREL	National Renewable Energy Laboratory
O&M	Operations and maintenance
PV	Photovoltaic
PQP	Product Qualification Program
PVEL	PV Evolution Labs
RAMP	Realizing Accelerated Manufacturing and Production for Clean Energy Technologies

[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
RETC	Renewable Energy Test Center
R&D	Research and development
RH	Relative humidity
TAC	Technical Advisory Committee
TCO	Transparent conducting oxide

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

A. Purpose of Agreement

The purpose of this Agreement is to fund comprehensive testing and validation of high-efficiency perovskite/silicon tandem photovoltaic panels. Efforts include outdoor durability testing, accelerated indoor assessments, and standard compliance testing to enhance technical bankability and support commercialization.

B. Problem/ Solution Statement

Problem

Traditional solar photovoltaic (PV) technologies, while essential for generating clean, reliable, and cost-competitive electricity from sunlight, are approaching their practical efficiency and cost limits. California struggles with high land and labor costs, making utility-scale solar deployment challenging. As California aims for an increasingly zero-carbon electricity grid, the need for more efficient and lower-cost PV solutions that are domestically manufactured becomes urgent, particularly as the current geopolitical environment uncertainty raises the cost for traditional solar PV products in the United States. However, conventional silicon-based PV technologies are approaching their efficiency limits and onshoring of these technologies and their full associated supply chain has proven challenging.

This stagnation highlights the need for innovative solutions like tandem PV technologies, which combine perovskite and silicon to create a tandem PV cell. This approach leverages the wide-bandgap properties of perovskite and the narrow-bandgap properties of silicon to enhance the overall efficiency of solar energy conversion.

Despite the potential of perovskite/silicon tandem PV, significant barriers to its commercialization remain. Establishing bankability for a new technology is an expensive and challenging endeavor while companies are simultaneously traversing the funding valley of death. A minimum set of requirements for technical bankability typically includes certification of performance, validation of manufacturing operations, multi-year outdoor testing, and passing extensive standardized test protocols. Perovskite technology has an additional challenge in that the standardized test protocols were written for different solar technologies with different associated failure modes, which may require the development of new test standards for

perovskite technology, which requires a significant dataset to establish confidence in a new standard.

Solution

This stagnation highlights the need for innovative solutions like tandem PV technologies, which combine perovskite and silicon to create a tandem PV cell. This approach leverages the wide-bandgap properties of perovskite and the narrow-bandgap properties of silicon to enhance the overall efficiency of solar energy conversion. By providing 30-40% more power, based on higher efficiency levels, than traditional silicon solar panels, the overall system costs are lower from requiring less land and labor. As well, the underlying perovskite technology is less expensive to manufacture at scale, lowering the overall costs of panels while increasing the amount of clean energy added to the grid.

The Recipient has successfully demonstrated perovskite/silicon tandem PV performance at the R&D scale, including large-area deposition, durability, packaging design, and a deep understanding of the manufacturing process flow, tooling, cost structure, and material supply chain. In this project, the Recipient will conduct, in collaboration with project partners, a comprehensive set of multi-year outdoor tests, standard accelerated tests, and indoor accelerated operational tests in order to establish on R&D mini-panels a baseline of technical bankability. Such a complete testing array will improve both real and perceived bankability of perovskite/silicon tandem technology in these pre-commercial R&D form factors, increasing private financing into domestic manufacturing and initial sales contracts.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Conduct operational durability testing to prove out multi-season and multi-year outdoor stability for perovskite/silicon tandem panels.
- Test 100+ 100cm^2 or larger perovskite/silicon tandem panels under a variety of conditions indoors and outdoors for long periods of time to establish correlated failure modes, acceleration factors, and multi-decade performance projections.
- Run standard accelerated tests to establish correlated failure modes and prove bankability and customer acceptance prior to commercial viability.

Ratepayer Benefits:[2] This Agreement will deliver ratepayer benefits in the form of lower-cost and increased reliability. Lower costs will result from more affordable, higher-efficiency solar panels, which reduce the balance of system costs for installed solar systems. By leveraging the recipient's high-efficiency solar panels, utility-scale projects can achieve greater energy

[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).

production, significant cost savings, and faster deployment, all while contributing to California's renewable energy targets and lowering the carbon footprint of electricity generation. The realized benefits of a lower Levelized Cost of Energy (LCOE) on a utility-scale will be seen by ratepayers through reductions in electricity costs.

Tandem PV technology increases reliability for utility-scale through increased efficiency, which allows for reduced system sizes and therefore more reliable installation with reduced risk of component failures. As well, this project aims to accelerate operational durability testing to ensure panels are designed to withstand multi-season and multi-year stressors, ensuring reliability under harsh utility-scale operating conditions. Lastly, this project would support the recipient's objective of achieving a degradation rate below 0.5% which would be lower than the average solar panel. This would provide utilities with stable energy output over a longer life-span with predictable performance and overall reliability improvements.

Technological Advancement and Breakthroughs:[3] This Agreement will drive technological advancements and breakthroughs to help California achieve its statutory energy goals by advancing the readiness of perovskite-based tandem solar technology through demonstrations of technology readiness through bankability testing. Achieving commercial readiness for this technology will break down barriers to the market for perovskite/silicon tandem solar panels, which will reduce both panel and installation costs, expanding and accelerating solar adoption. The greatest impact will be achieved through utility-scale deployment, where land and cost constraints have historically limited solar expansion. The recipient's integration of high-efficiency solar panels at the utility scale will enable significantly increased solar capacity, which will accelerate California's efforts to reach its energy goals.

Agreement Objectives

The objectives of this Agreement are to:

- Conduct operational durability testing to establish multi-season and multi-year outdoor stability for tandem perovskite/silicon solar panels.
- Identify and address infant failures and emerging failure modes through comprehensive testing.
- Collaborate with third-party experts (e.g., The Renewable Energy Test Center (RETC) and The University of California, San Diego (UCSD)) and enhance internal testing feedback capabilities.
- Test over 100 panels (each 100 cm²) under varied indoor and outdoor conditions for extended periods.
- Target a 30-year panel lifespan with an annual degradation rate of less than 0.5%.
- Conduct standard accelerated tests, including IEC 61215, Product Qualification Program (PQP), Thresher, and the Photovoltaic Accelerator for Commercializing Technologies International Summit on Organic and Perovskite Solar Cells Stability sequence, to prove product bankability.
- Perform tests in-house and with external partners (e.g., RETC) to meet customer requirements and achieve certifications.

[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.

- Build customer confidence and secure acceptance by demonstrating reliability and durability through rigorous testing.

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., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare and submit a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* with a list of expected CPR participants in advance of the CPR meeting. If applicable, the agenda 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., 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 and execute subrecipients and site host agreements, as applicable, required to carry out the tasks under this Agreement; and (2) ensure that the subrecipients and site host agreements are consistent with the Agreement terms and conditions and the Recipient's own contracting policies and procedures.

The Recipient shall:

- Execute and manage subawards and coordinate subrecipient's 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 Letter* to the CAM describing the subawards and any site host agreement needed or stating that no subaward agreements are required.
- If requested by the CAM, submit a draft of each *Subaward Agreement* required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed *SubawardAgreement*.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding subrecipient additions in the terms and conditions).

Products:

- Subaward Letter
- Draft Subawards *(if requested by the CAM)*
- Final Subawards *(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* for each TAC Meeting 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 OUTDOOR FIELD TESTING

The goals of this task are to establish multi-year perovskite silicon tandem module outdoor performance behavior, measure and calculate energy yield and degradation rate behavior, identify non-linear degradation sources, and improve testing capabilities at project partner sites to collect high-precision data.

The Recipient shall:
- Expand outdoor test capabilities at project participant locations including:
    - Plane of array irradiance with spectral breakdown
    - Ambient temperature and wind speed
    - 3-quadrant panel IV characteristics
    - Module temperature
- Conduct multi-year outdoor field tests on perovskite-tandem panels and perform the following analyses:
    - Non-linear degradation and infant failure yield rates and root cause analysis
    - Full-year energy yield
    - Statistical prediction of initial metastability behaviors
    - Linear degradation rate
- Make improvements to the panel design to address identified non-linear degradation and infant failure root causes.
- Prepare an *Outdoor Test Plan* that includes but is not limited to:
    - Test locations
    - Quantity of panels to be tested and frequency of module deliveries for outdoor testing
    - Frequency of metrology checks and measurements to be performed
- Prepare a draft *Outdoor Test Report* that includes but is not limited to:
    - Full efficiency over-time traces for tested panels
    - Identified non-linear degradation and infant failure root causes

  - Design and engineering improvements to non-linear degradation and infant failure root causes and efficacy of the improvements
  - Calculated temperature behavior of panels
  - Calculated illumination intensity behavior of panels
  - Calculated energy yield
  - Calculated linear degradation rate
- Submit the draft *Outdoor Test Report* to the CAM for feedback and incorporate changes as requested in the final *Outdoor Test Report*.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:
- Outdoor Test Plan
- Outdoor Test Report (draft and final)
- CPR Report #1

TASK 3 INDOOR OPERATIONAL ACCELERATED TESTING
The goals of this task are to establish long-term perovskite silicon tandem module behavior to multi-stressor operational environments including temperature, light intensity, and voltage. Such behavior will be correlated with outdoor test data to establish acceleration factors. Known acceleration factors will then be used to compress perovskite silicon tandem module testing sequences to enable multi-decade performance projections in multi-month tests.

The Recipient shall:
- Expand indoor test capabilities including:
  - Parallel test capability of 200+ panels form factors
  - Test capability includes A+ spatial rating on white light source, 3-quadrant module IV testing, maximum power point tracking, module heating and cooling
- Conduct 1,000+ hour indoor operational accelerated tests with variables including:
  - Variable light intensity
  - Variable steady state voltage including both open circuit voltage and voltage at maximum power point
  - Variable module temperature ranging from 25C to 90C
- Analyze results of indoor operational accelerated tests for:
  - Non-linear degradation and infant failure modes and root causes
  - Arrhenius or other behavior to temperature
  - Linear or other behavior to light intensity
  - Exponential or other behavior to operating voltage
- Correlate and validate behaviors observed in outdoor testing to establish acceleration factors.
- Make multi-decade performance projections using indoor operational accelerated tests and established acceleration factors.
- Prepare an *Indoor Test Plan* that includes but is not limited to:
  - Statistical sample quantities
  - Planned test matrix
- Prepare a draft *Indoor Test Report* that includes but is not limited to:

  - Performance over-time traces for tested panels
  - Identified non-linear degradation and infant failure root causes
  - Design and engineering improvements to non-linear degradation and infant failure root causes and efficacy of the improvements
  - Calculated temperature behavior of panels
  - Calculated illumination intensity behavior of panels
  - Calculated operating voltage behavior of panels
  - Statistical analysis of the correlation between indoor test results and outdoor behavior
  - Calculation of validated acceleration factors
  - Multi-decade performance projection using established acceleration factors and indoor operational accelerated tests.
- Submit the draft *Indoor Test Report* to the CAM for feedback and incorporate changes as requested in the final *Indoor Test Report*.

Products:
- Indoor Test Plan
- Indoor Test Report (draft and final)

TASK 4 STANDARDIZED ACCELERATED TESTING
The goals of this task are to determine the relevance of standardized accelerated tests for predicting the infant and long-term failure modes of perovskite silicon tandem panels.

The Recipient shall:
- Prepare a *Standardized Test Plan* that includes but is not limited to:
  - Statistical samples quantities
  - Planned test matrix to minimally include
    - PQP tests
    - IEC 61215 tests
    - Protocols established by the Department of Energy-funded Photovoltaic Accelerator for Commercializing Technologies.
- Establish necessary test capabilities at participating organizations.
- Conduct standardized accelerated tests according to the *Standardized Test Plan.*
- Analyze results of standardized accelerated tests and establish correlations with data collected in other tasks.
- Prepare a *Standards Recommendations Memo* that includes recommendations to standards bodies with supporting data for which standardized accelerated tests have relevance to failure modes observed in outdoor testing.
- Prepare a draft *Standardized Test Report* that includes but is not limited to:
  - Performance of the tested panels before and after the applied tests
  - Identified failure modes in post-mortem analysis
  - Design and engineering improvements to identified failure modes and efficacy of the improvements
  - Qualitative correlation of identified failure modes to linear, non-linear, and infant failure modes observed in outdoor testing and indoor operational accelerated testing
  - Recommendations for which standardized accelerated tests have the strongest qualitative correlations

- Submit the draft *Standardized Test Report* to the CAM for feedback and incorporate changes as requested in the final Indoor Test Report.

Products:
- Standardized Test Plan
- Standards Recommendations Memo
- Standardized Test Report (draft and final)

TASK 5: 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 6 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 an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation(s) 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

Exhibit A
Scope of Work
Tandem PV, Inc

Please see the attached Excel spreadsheet.