



**CALIFORNIA
ENERGY COMMISSION**



**California Energy Commission
November 13, 2024 Business Meeting
Backup Materials for Hilmar Cheese Company, 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: 24-1113-06c

STATE OF CALIFORNIA

**STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION**

RESOLUTION: Hilmar Cheese Company, 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 IND-24-005 with Hilmar Cheese Company, Inc. for an \$8,000,000 grant. The agreement will electrify the product heat step with industrial heat pumps and implement high-pressure reverse osmosis at a cheese and dairy processing facility in Hilmar to decrease gas combustion and direct GHG emissions; and

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

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the CEC held on November 13, 2024.

AYE:

NAY:

ABSENT:

ABSTAIN:

Dated:

Kristine Banaag
Secretariat



GRANT REQUEST FORM (GRF)

A. New Agreement Number

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

New Agreement Number: IND-24-005

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Tannis Breure
3. MS-:51
4. Phone Number: Enter Phone Number

C. Recipient's Information

1. Recipient's Legal Name: Hilmar Cheese Company, Inc.
2. Federal ID Number: 77-0026482

D. Title of Project

Title of project: Hilmar Lactose System Electrification

E. Term and Amount

1. Start Date: 12/1/2024
2. End Date: 3/31/2028
3. Amount: \$8,000,000.00

F. Business Meeting Information

1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 11/13/2024 .
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Patricia De La Torre
5. Time Needed for Business Meeting: 5 minutes.
6. The email subscription topic is: Research (Energy RD&D / INDIGO program).

Agenda Item Subject and Description:

Hilmar Cheese Company, Inc. Proposed resolution approving agreement IND-24-005 with Hilmar Cheese Company, Inc. for a \$8,000,000 grant to electrify the product heat step with industrial heat pumps and implement high-pressure reverse osmosis to decrease gas combustion and direct GHG emissions and adopting staff's determination that this action is exempt from CEQA. (INDIGO funding) Contact: Patricia De La Torre (Staff Presentation: 5 minutes)

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.

The California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) requires public agencies to consider the potential impacts to the environment that may arise from the approval of projects.

Cal. Code Regs., tit. 14, sect. 15301 provides that projects which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alternations of existing public or private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of existing or former use at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act (CEQA).

Section 15301 applies to the project at Hilmar Cheese Company because the project includes the installation of an electrified, non-thermal separation, reducing GHG emitting processing system for concentrating lactose permeate to at least 30% total solids using industrial heat pumps for process heating electrification and non-thermal separation of high-pressure RO (HPRO). The project will also install variable frequency drives (VFDs) and advanced motors that will allow for optimized energy efficiency, and industrial heat pumps will be installed for process heat electrification. The project will reduce both GHG and criteria air pollutant emissions; only a small structure will be added to house new controls and VFDs, so that less than 50% of the floor area and less than 2500 square feet of floor area will be added to the existing



structure; and the project will not result in any substantial additional environmental risks. Thus, it falls under categorical exemption 15301 for Existing Facilities. This project does not involve impacts on any particularly sensitive environment; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2 apply to this project, and this project will not have a significant effect on the environment.

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”?

Yes

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
Yorke Engineering	\$ 70,000	\$ 20,000

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.



STATE OF CALIFORNIA
CALIFORNIA ENERGY COMMISSION

Grant Request Form
CEC-270 (Revised 01/2024)

Vendor/Seller Legal Company Name	CEC Funds	Match Funds
Tetra Pak	\$4,067,637	\$4,912,589
Central Valley Electric	\$463,183	\$349,418
Anderson Litfin	\$320,847	\$242,042
Americore	\$180,512	\$136,175
Factory Technologies	\$151,794	\$114,511
Rexel	\$284,224	\$214,414
Superior Mechanical	\$36,851	\$27,799
Baez Design Group	\$256,500	\$193,500

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
GGRF	22-23	303.202	\$ 8,000,000

TOTAL Amount: \$ 8,000,000

R&D Program Area: ESB: EA

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: 101

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Mindy Neves

Address: 8901 Lander Ave

City, State, Zip: Hilmar, CA 95324-8355

Phone: 209-656-2549

E-Mail: mneves@hilmarcheese.com



3. Recipient's Project Manager

Name: Tara Schuelke

Address: 8901 Lander Ave

City, State, Zip: Hilmar, CA 95324-8355

Phone: 209-620-1177

E-Mail: tschuelke@hilmarcheese.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-23-313
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: Tannis Breure

Approval Date: 10/2/2024

Branch Manager: Cody Taylor

Approval Date: 10/4/2024

Director: Cody Taylor for Angela Gould

Approval Date: 10/4/2024

EXHIBIT A
Scope of Work
Hilmar Cheese Company

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Project Engineering Design
3	X	Site Preparation and Equipment Procurement
4	X	Equipment Installation
5		Evaluation of Project Benefits
6		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CIP	Clean In Place
CPR	Critical Project Review
GHG	Green House Gas
HPRO	High Pressure Reverse Osmosis
MCC	Motor Control Center
M&V	Measurement & Verification
MPV	Mix Proof Valve
MPVs	Mix Proof Valves
MVR	Mechanical Vapor Recompression
OEM	Original Equipment Manufacturer
PLC	Programmable Logic Controller
Recipient	Hilmar Cheese Company
RO	Reverse Osmosis
VFD	Variable Frequency Drive

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the Recipient's processing step involving process heat electrification, energy efficiency, and non-thermal separation of a lactose concentration. The project will reduce GHG emissions, provide air pollution benefits to priority populations, and demonstrate the scalability and application of high-pressure reverse osmosis and industrial heat

¹ Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

EXHIBIT A

Scope of Work

Hilmar Cheese Company

pumps to other dairy and food processing facilities, other industries, and other processors globally.

B. Problem/ Solution Statement

Problem

Lactose permeate, a liquid stream separated from milk as part of the cheese making and whey protein powder making process, must be concentrated for its sale as a stand-alone liquid product or as a powdered product for human consumption uses such as infant formula and bakery products. Concentration of the liquid is achieved with non-thermal separation of up to 15% total solids using reverse osmosis (RO) membranes followed by thermal separation, including mechanical vapor recompression (MVR) evaporation. RO followed by MVR evaporation represents the available technology to concentrate lactose permeate when it was installed in the mid-1990s. The standard polymeric membrane RO systems alone are not capable of concentrating the lactose to the level required due to RO pressure constraints. With a focus on reducing the carbon intensity of the Recipient's operations and reducing local impacts from combustion emissions, a change to electrification and non-thermal separation, utilizing advanced controls for energy efficiency, is required.

Solution

The Recipient designed and will install an electrified, non-thermal separation, reduced GHG emitting processing system for concentrating lactose permeate to at least 30% total solids using industrial heat pumps for process heating electrification and non-thermal separation of high-pressure RO (HPRO) along with the installation of VFDs and advanced motors and controls for optimized energy efficiency. The HPRO uses high-pressure polymeric membranes to concentrate lactose permeate from 5% to 30% total solids, separating the lactose from minerals and water without thermal energy.

An industrial heat pump will be installed for process heat electrification. By implementing this industrial heat pump, advanced motor and controls, along with the HPRO system, this project will be a standardized example of a decarbonized liquid concentrating system with reduced GHG emissions for reference by industries across the globe.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Demonstrate and validate HPRO technology as a reliable, effective, and more efficient technology for non-thermal separation of lactose permeate for solids concentration at approximately 1,700,000 gallons per day
- Demonstrate and validate process heat electrification in the dairy industry utilizing industrial heat pump technology.
- Benefit priority populations in the Hilmar area, particularly the priority population of Delhi 2.3 miles from Hilmar, by reducing local emissions of air contaminants and reducing impact on local water supplies.

EXHIBIT A

Scope of Work

Hilmar Cheese Company

- Engage, benefit, and grow the community's education and knowledge, with a focus on the youth community, in environmental stewardship, process electrification, and energy efficiency.

Benefits:²

This Agreement will result in the California IOU ratepayer benefit of greater electricity reliability, lower costs, and increased safety. With this project, Hilmar is reducing the associated electrical energy for the process by switching to non-thermal separation, industrial heat pump installation, and utilizing advanced motors and controls. This reduction of electrical demand, will reduce the demand on the electrical grid, making more electricity available to other grid stakeholders, which improves the reliability of the grid.

The Recipient's electricity demands will be consistently less than their current levels. This therefore improves the safety of the grid for ratepayers because it decreases the risk of grid demand fluctuation induced safety incidents or external safety incidents that depend on a reliable grid that operates with fewer surges or significant fluxes, particularly during peak periods. Reducing the risk of safety incidents is also a benefit to ratepayers because it will improve the affordability of electricity by decreasing the likelihood of infrastructure damage caused by such incidents such as wildfires.³

This project will also provide ratepayer benefits of lower costs because with the reduced electrical demand, there will be less risk that high-cost peak power plants will need to be brought online to ensure that grid demand is met.

Technological Advancement and Breakthroughs:⁴ 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 demonstrating at full, commercial scale a decarbonized industrial heat pump for process heat electrification at a large manufacturing facility as a standard part of operations. This project will be an example of successfully using industrial heat pump technology in food processing as an economically viable and reliable source for process heat and will be seen as a staple in the industrial and manufacturing sectors, both in California and globally.

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 demonstrating at full, commercial scale, non-thermal separation, replacing a current thermal separation process, with the resultant outcome of reduced GHG emissions. Thermal separation is a standard in food processing and the dairy industry, and this will be a use case demonstrating the feasibility of switching to a non-thermal technology and sustaining the same manufacturing and product expectations.

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

³

⁴ 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.

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Hilmar Cheese Company

Agreement Objectives

The objectives of this Agreement are to:

- Demonstrate use of an industrial heat pump and HPRO as a standardized example of an electrified system for process heating, energy efficient with advanced motors and controls, and of a non-thermal separation system with reduced GHG emissions, for reference by the dairy industry and other industries that currently use thermal separation where non-thermal separation could be used.
- Demonstrate the efficiency of non-thermal membrane separation systems utilizing advanced motors and controls with equipment improvements, optimized control strategies, and variable speed operation.
- Reduce annual onsite electricity consumption by over 2,000,000 kWh.
- Reduce annual onsite natural gas consumption by over 200,000 therms.
- Measure electrical energy consumption, natural gas consumption, and water use before and after installation of the industrial heat pump, advanced motors and controls, and HPRO system to verify expected reductions.
- Share project results, lessons learned, and benefits with relevant industries and the public.
- Provide a forum at the Recipient's visitor center for students and the community at large to learn about environmental stewardship, process electrification, and energy efficiency.

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.

EXHIBIT A

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- 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.

EXHIBIT A

Scope of Work

Hilmar Cheese Company

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

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- 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.

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Hilmar Cheese Company

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.

EXHIBIT A

Scope of Work

Hilmar Cheese Company

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.

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Scope of Work

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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

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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.

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- 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*)

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Subtask 1.10 Subawards

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:

- Manage 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.
- If requested by the CAM, submit a draft of each *Subaward* required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed subaward.
- 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 (*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.

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- 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.

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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.

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- 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

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IV. TECHNICAL TASKS

TASK 2 PROJECT ENGINEERING DESIGN

The goal of this task is to design the necessary equipment and plan the equipment layout for the project site. The piece(s) of equipment that need to be designed for the HPRO system are the industrial heat pump process and utility interconnections, heat exchangers for CIP of the HPRO, the heat exchanger for heating of HPRO concentrate, the MPV routing cluster for HPRO concentrate for storage and CIP, storage tank for HPRO concentrate, the MCC room, PLC network, mezzanine for MPV routing cluster and concentrate heat exchanger, and safety equipment. The equipment will be installed at the processing facility in Hilmar, California.

The Recipient shall:

- Prepare and plan community engagement design and displays.
- Prepare block flow process diagram with temperature and flow rate profile of industrial heat pump, HPRO system and ancillary equipment.
- Plan layout and locations of industrial heat pump, MCC room and controls for industrial heat pump, and transformer for new MCC room fed by new transformer for industrial heat pump.
- Plan layout and locations of all HPRO process equipment, heat exchangers, MPV's, CIP, and MCC room housing VFDs.
- Provide a *Test Plan* inclusive of HPRO and industrial heat pump integration.
- Plan maintenance and safety access designs.
- Plan PLC electrical and controls drawings for equipment.
- Provide a *Project Design Memo* to help the CEC understand how funds are spent, to support continued reimbursement and describe how the Recipient will overcome barriers of its project. It shall include, but not be limited to:
 - Summary of the steps taken to reach the final design and final layout.
 - Identification of barriers involved and discuss the steps taken to overcome those barriers.
 - Discussion of the final engineer design and equipment layout for each site.
 - Elements of community engagement design and displays.

Products:

- Project Design Memo
- Test Plan

TASK 3 SITE PREPARATION AND EQUIPMENT PROCUREMENT

The goal of this task is to procure the necessary equipment and materials for this project. The equipment to be procured includes MPVs, concentrate heat exchangers, CIP equipment, PLC equipment, VFDs, and HPRO system.

The Recipient shall:

- Determine the final location for equipment.
- Determine final location for community engagement displays.
- Secure final proposal and drawings from structural engineer that will be for mezzanine and MCC room design and construction instructions.

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- Secure final proposals and procure equipment from the same original equipment manufacturer (OEM), including performance specifications and equipment warranties.
- Secure final proposals and procure PLC, VFDs, HPRO, MPV's, CIP and concentrate heat exchangers, including equipment warranties.
- Secure final proposals and procure community engagement materials.
- Approve design and specifications of HPRO system to be installed, including equipment specifications and locations such as motor and pump types, valve types, and instrumentation types from OEM.
- Provide a *Site Preparation and Equipment Procurement Memo* to help the CEC understand how funds are spent, to support continued reimbursement and describe how the Recipient will overcome barriers of its project. It shall include, but not be limited to:
 - Summary of the steps to prepare the site(s).
 - Copy of the performance specifications for each piece of equipment purchased by the grant.
 - Summary of the bids received and from whom.
 - Copies of all required permits needed for installation at each site.
 - Copies of the final procurement documents and purchase orders.
 - Status of the planned installation including a preliminary schedule for equipment delivery and installation for each site.
- Prepare a *CPR Report #1* in accordance with subtask 1.3.
- Participate in a CPR Meeting.

Products:

- Site Preparation and Equipment Procurement Memo
- CPR Report #1

TASK 4 EQUIPMENT INSTALLATION

The goal of this task is to install and commission the equipment for this project. The equipment to be installed includes VFDs, PLCs, heat exchangers, MPVs and HPRO system.

The Recipient shall:

- Construct and install community engagement displays.
- Construct mezzanine for safety and maintenance access of MPVs, concentrate heat exchanger, and MCC room.
- Construct MCC room for VFDs and PLC controls network
- Expand structure of existing RO system to hold HPRO vessels that house the HPRO membranes.
- Complete installation of industrial heat pump and HPRO pumps, valves, and vessels.
- Test industrial heat pump and HPRO system, concentrate heat exchanger, and MPVs for electrical communication and control to PLC and VFDs.
- Test industrial heat pump and HPRO system, concentrate heat exchanger, and MPVs on water.
- Test and CIP HPRO system, concentrate heat exchanger, MPVs and industrial heat pump against performance specifications.
- Commission equipment on lactose permeate product; test to meet performance specifications.

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- Provide an *Equipment Installation Memo* to help the CEC understand how funds are spent, support continued reimbursement and describe how the Recipient will overcome barriers of its project. It shall include, but not be limited to:
 - Summary of the equipment installation requirements for each demonstration site.
 - Identification of barriers involved during installation and discuss the steps taken to overcome those barriers.
 - Discussion of results of equipment start-up and commissioning at each site with respect to whether the equipment as installed meets the stated performance specifications.
 - Overview of the community engagement displays installation.
- Prepare a *CPR Report #2* in accordance with subtask 1.3.
- Participate in a CPR Meeting.

Products:

- Equipment Installation Memo (*draft and final*)
- CPR Report #2

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 December 1 of each year. The Annual Survey includes but is not limited to the following information:
 - AB 209 Requirements⁵
 - Technology scalability, and adoption by other industries
 - News media and publications
 - Technology Company growth
 - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

⁵ Assembly Bill 209, Chapter 251, Statutes of 2022, Section 25660.2

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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 ensure the learning that resulted from the demonstration(s) is captured and disseminated to the range of professions that will be responsible for future deployments of this technology or similar technologies.

The Recipient shall:

- Develop and submit a *Project Case Study Plan* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The Project Case Study Plan should include:
 - An outline of the objectives, goals, and activities of the case study.
 - The organization that will be conducting the case study and the plan for conducting it.
 - A list of professions and practitioners involved in the project's development.
 - Specific activities the Recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
 - Presentations/webinars/training events to disseminate the results of the case study.
- Present the Draft Project Case Study Plan to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the draft *Project Case Study 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 and explanation why.
- Submit the final *Project Case Study Plan* to the CAM for approval.
- Execute the final *Project Case Study Plan* and develop and submit a *Project Case Study*.
- 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 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:

- Project Case Study Plan (draft and final)
- Summary of TAC Comments
- Project Case Study (draft and final)

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- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.