California Energy Commission
March 17, 2025 Business Meeting
Backup Materials for Heirloom Carbon Technologies, 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
4. CEQA Materials

RESOLUTION NO: 25-0317-03g

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: DEMONSTRATION OF A PRE-COMMERCIAL, ELECTRIFIED THERMAL REACTOR WITH INTEGRATED LIME HYDRATION FOR USE IN DIRECT AIR CAPTURE

WHEREAS, the City of Tracy (City), through its Community and Economic Development Director, is the Lead Agency for purposes of the California Environmental Quality Act (CEQA) with respect to the Demonstration of a Pre-Commercial, Electrified Thermal Reactor with Integrated Lime Hydration for use in Direct Air Capture (Project), a proposed project for the design and build-out of an electric reactor and tower that will be integrated with an operational direct air capture facility in Tracy; and

WHEREAS, the City prepared the Tracy Desalination and Green Energy Project Initial Study and Mitigated Negative Declaration (IS/MND) (SCH # 2011122004), the 2024 Addendum to the IS/MND, and Resolution No. 2012-75 (CEQA Documents) to evaluate the potential impacts of the Project; and

WHEREAS, the City, on January 22, 2025, through its Community and Economic Development Director, passed, approved, and adopted the CEQA Documents, copies of which are on file with the CEC, thereby finding that the Project will not result in new significant environmental impacts in light of the mitigation measures imposed on the project reflected in the IS/MND; and

WHEREAS, the CEC is now considering the proposed Agreement EPC-24-021 with Heirloom Carbon Technologies, Inc. (Heirloom) for a $6,364,788 grant for the design and build-out of a pre-commercial electric downer calciner reactor and tower with an in-line hydration system that will be integrated with an operational direct air capture facility in Tracy, which will be capable of capturing between 500 and 1,000 tons of CO_2 annually; and

WHEREAS, the Energy Commission has both reviewed the CEQA Documents as well as used its own independent judgment to consider the potential environmental impacts of proposed Agreement EPC-24-021 and the proposed Project; and

Prior to acting on Agreement EPC-24-021, the Energy Commission desires to make certain findings pursuant to CEQA Guidelines, title 14, sections 15091 and 15096.

THEREFORE, BE IT RESOLVED, to the extent relevant to proposed Agreement EPC-

24-021, the Energy Commission has reviewed and considered the information and CEQA findings contained in the City's CEQA Documents and the Determination of the Community and Economic Development Director of January 22, 2025, approving the project as documented in Staff's CEQA Analysis memo included in the backup materials.

FURTHER BE IT RESOLVED, that, the Energy Commission finds the City's CEQA Documents are adequate for its use as the decision-making body for its consideration of Agreement EPC-24-021, and that approval of Agreement EPC-24-021 is within the scope of the City's CEQA Documents. The Energy Commission further finds that the City has adopted the mitigation measures recommended in the City's IS/MND, and has authority to implement the mitigation measures or to seek any required approvals for those measures, and the Energy Commission has no direct authority to implement those measures.

FURTHER BE IT RESOLVED, that, since the City's CEQA Documents were finalized, there have been no substantial project changes and no substantial changes in the project circumstances that would require major revisions to these documents due to the involvement of new significant environmental effects or an increase in the severity of previously identified significant impacts, and there is no new information of substantial important that would change the conclusions set forth therein.

FURTHER BE IT RESOLVED, that the Energy Commission has not identified any feasible alternative or additional feasible mitigation measures within its power that would substantially lessen or avoid any significant effect which Agreement EPC-24-021 would have on the environment.

THEREFORE BE IT RESOLVED, that the Energy Commission finds, on the basis of the entire record before it, that the mitigation measures incorporated into the City's CEQA Documents, will prevent Agreement EPC-24-021 from having any significant effects on the environment.

FURTHER BE IT RESOLVED, that this document authorizes the Executive Director or his or her designee to prepare and file a Notice of Determination on behalf of the Energy Commission.

FURTHER BE IT RESOLVED, that the Energy Commission approves Agreement EPC-24-021 with Heirloom for a $6,364,788 grant for the design and build-out of an electric calciner reactor and tower that will be integrated with an operational direct air capture facility, which will be capable of capturing between 500 and 1,000 tons of CO_2 annually; 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 March 17, 2025.

AYE:
NAY:
ABSENT:
ABSTAIN:

Dated:

_____
Kristine Banaag
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-24-021

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Maryam Haddad
3. MS-:None
4. Phone Number: 279-226-1011

C. Recipient's Information

1. Recipient's Legal Name: Heirloom Carbon Technologies, Inc.
2. Federal ID Number: MJX6YPKHBNJ5

D. Title of Project

Title of project: Demonstration of a Pre-Commercial, Electrified Thermal Reactor with Integrated Lime Hydration for use in Direct Air Capture

E. Term and Amount

1. Start Date: 05/01/2025
2. End Date: 3/30/2029
3. Amount: $6,364,788.00

F. Business Meeting Information

1. Are the ARFVTP agreements $75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 03/17/2025
3. Consent or Discussion? Consent
4. Business Meeting Presenter Name: None
5. Time Needed for Business Meeting: None
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

Agenda Item Subject and Description:

Heirloom Carbon Technologies, Inc. Proposed resolution adopting CEQA findings for Heirloom Carbon Technologies, Inc.'s demonstration of a pre-commercial, electrified thermal reactor with integrated lime hydration for use in a direct air capture project, and approving grant agreement EPC-24-021 with Heirloom Carbon Technologies, Inc. (EPIC funding) Contact: Maryam Haddad.

i. CEQA Findings. Finding that, based on the lead agency City of Tracy's 2012 Mitigated Negative Declaration (MND), 2024 Addendum to the Tracy Desalination and Green Energy Project MND (Addendum), required mitigation measures, and Resolution No. 2012-75, the proposed project presents no new or substantially more severe environmental impacts beyond those already considered.

ii. Heirloom Carbon Technologies, Inc. Proposed resolution approving agreement EPC-24-021 with Heirloom Carbon Technologies, Inc. for a $6,364,788 grant for the design and build-out of

a pre-commercial electric reactor (calciner) and tower with an in-line hydration system that will be integrated with an operational direct air capture facility in Tracy.

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?

No

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?
No

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: None

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.

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

Yes

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	Yes
Negative Declaration	No
Mitigated Negative Declaration	Yes
Environmental Impact Report	No

Statement of Overriding Considerations	No
None	No

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
Leilac	$ 0	**$1,564,432**
TBD Structural Engineering Consultant		**$98,000**
TBD Mechanical Engineering Consultant		**$75,000**
TBD Electrical Engineering Consultant		**$85,000**

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.

Vendor/Seller Legal Company Name	CEC Funds	Match Funds
TBD - Engineering, Procurement & Construction - Vendor	$2,154,921	$773,301
TBD - Environmental Consultant - Vendor	$5,000	$0
TBD - Architect Design -Vendor	$0	$98,000
TBD - Structural Engineer- Vendor	$0	$35,000
TBD - Engineering Consultant - Vendor	$0	$75,000
TBD - Educational Specialist - Vendor	$15,000	$0
TBD - Photographer - Vendor	$5,000	$0
TBD-M&V-Vendor	$20,000	$0
Schaub Umwelttechnik GmbH – Hydrator Equipment	$0	$475,000
TBD – Electrical Equipment	$45,000	$0
TBD – IR Gas Analyzer Equipment	$5,000	$20,000
TBD – Moving Site Equipment	$0	$72,000
TBD - Gas Metering Equipment	$0	$25,000
TBD – Construction Rental Equipment	$0	$25,000

TBD – Rigging Equipment	**$**0	**$**25,000

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	23-24	301.001K	$ 6,364,788

TOTAL Amount: $ 6,364,788

R&D Program Area: ICMB: IAW

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: 101

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Chakriya Srey

Address: 125 Valley Dr

City, State, Zip: Brisbane, CA 94005-1317

Phone: (774) 488-4792

E-Mail: chakriya.srey@heirloomcarbon.com

3. Recipient's Project Manager

Name: Priya Patel

Address: 125 Valley Dr

City, State, Zip: Brisbane, CA 94005-1317

Phone: (708) 821-7246

E-Mail: priya@heirloomcarbon.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-22-301r2
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: Maryam Haddad

Approval Date: August 21, 2024

Branch Manager: Cody Taylor

Approval Date: August 22, 2024

Director: Jonah Steinbuck - *Delegated to Branch Manager*

Approval Date: August 22, 2024

Exhibit A
Scope of Work
Heirloom Carbon Technologies

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	X	Pre-Commercial Reactor Design
3		Lime Hydration Design
4		Pre-Commercial Reactor Construction
5	X	Pre-Commercial Reactor Commissioning
6		Initial Performance Testing
7	X	Integration and Testing of Lime Hydration
8		System Operation, Measurement, and Verification
9		Evaluation of Project Benefits
10		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
DAC	Direct Air Capture
TAC	Technical Advisory Committee
DAC	Direct Air Capture
CO_2	Carbon Dioxide
GHG	Greenhouse Gasses
US EPA	United States Environmental Protection Agency
CaO	Calcium Oxide
$CaCO_3$	Calcium Carbonate, or Limestone
$Ca(OH)_2$	Calcium Hydroxide
VPPA	Virtual Power Purchase Agreement
MS	Microsoft
OSHA	Occupational Safety and Health Administration
CEQA	California Environmental Quality Act
I/O	Input/Output Check
~500 kg $CaCO_3$ per hour	Target throughput/material fed into calciner per hour
CAD	Computer Assisted-Design

[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
Heirloom Carbon Technologies

Acronym/Term	Meaning
kg	kilogram
kWh/tCO_2	KiloWatt hours per ton of CO_2
Calcination Extent	Calcination extent expresses the proportion of calcium carbonate material that has been converted to calcium oxide material during thermal decomposition, as a percentage. (mol% CaO / mol% CaCO3 x 100%)

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the design and build-out of a pre-commercial electric reactor (colloquially called a 'calciner' in the cement industry) with a lime hydration system that will be integrated with an operational direct air capture (DAC) facility. This will result in a more energy efficient DAC process, produce an optimal material for capturing carbon dioxide (CO_2) uptake, and serve as a method for chemical energy storage for continuous, flexible operations.

B. Problem/ Solution Statement

Problem

Atmospheric concentrations of CO_2 have exceeded 410 ppm, while yearly emission levels exceed 35 $GtCO_2$. In the US, the industrial sector represents 30% of all greenhouse gasses (GHG) emissions (US EPA, 2021). Industrial decarbonization requires a two-fold approach—aggressive GHG emissions reductions and DAC of atmospheric CO_2. DAC using low-cost, Earth-abundant materials (limestone) offers an innovative approach to advancing industrial decarbonization and achieving net neutrality in California. Separating pure CO_2 from limestone can be accomplished via calcination using a high temperature (>1000°C) reactor (referred to as a "calciner" in the cement industry). This key process poses two technical challenges: 1) fossil-fuel reactors using natural gas or coal emit GHG and other air pollutants and 2) currently available electric rotary reactors are energy intensive and are not available at a sufficient scale for climate-relevant carbon removal. High energy use leads to operating cost barriers that limit scaled DAC deployment and fossil fuel use for DAC presents sustainability challenges.

Solution

The Recipient has developed a DAC process using limestone (or calcium carbonate ($CaCO_3$)) to capture CO_2 from the atmosphere. In this process, calcium carbonate is fed into a high-temperature, electric reactor, where it decomposes into CO_2 and calcium oxide (CaO). The CO_2 is then captured and stored permanently away from the atmosphere. The calcium oxide is subsequently hydrated to form calcium hydroxide ($Ca(OH)_2$), which is highly reactive with atmospheric CO_2. This calcium hydroxide acts like a sponge, absorbing more CO_2 from the atmosphere. Once saturated, the material is processed again in the kiln, extracting the CO_2 and beginning the cycle anew.

For the proposed project, the Recipient will incorporate a 100% renewable energy-powered reactor, consisting of an electric flash reactor with integrated lime hydration, for increased

energy efficiency. The flash calciner provides a higher thermal efficiency compared to fossil-fuel driven reactors and can be integrated with variable renewable generation to eliminate GHG emissions. This would result in 25 percent or greater reduction in fossil fuel use from equipment electrification, 25 percent or greater reduction of facility-level GHG emissions, 10 percent or greater reduction in operational and maintenance costs and simple payback* of under three years. When integrated with an in-line lime hydration system, heat recovered from the exothermic reaction of calcium oxide to calcium hydroxide ($CaO \rightarrow Ca(OH)_2$) can be used for steam generation, further reducing overall energy requirements for the DAC process.

The lower energy requirements of the proposed system compared to existing commercial DAC facilities lower operating costs to enable scale for near-term, climate-relevant carbon removal. Integration with renewable resources via a virtual power purchase agreement (VPPA) and sizing the system for chemical energy storage (lime) allows utilization of renewable electricity during periods of excess generation, avoiding curtailment and enhancing the safety and reliability of California's electric grid.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Develop an energy-efficient CO_2 separation process that lowers the energy consumption of DAC by at least 24% compared to other commercially-available DAC technologies, enabling billion-ton carbon removal.
- Demonstrate the economic feasibility of intelligently sizing the system for chemical energy storage to enable flexible operations, providing grid services during peak demand periods.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of improved grid reliability and reduced GHG emissions by 1) reducing the overall energy requirements for the proposed DAC process; 2) utilizing excess renewable energy resources through a VPPA; 3) leveraging chemical energy storage during periods of peak energy demand; and 4) capturing atmospheric CO_2 emissions, supporting net neutrality and limiting the worst impacts of climate change across California's communities and ecosystems. Additional ratepayer benefits will include high-quality job creation, technology investment, and workforce investments with community designed co-benefits in support of disadvantaged communities in California.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of California's statutory energy goals by developing and demonstrating an energy-efficient CO_2 separation process for direct air capture with potential applications in the cement and lime industries.

[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]

Exhibit A
Scope of Work
Heirloom Carbon Technologies

Agreement Objectives

The objectives of this Agreement are to:

- Design, construct, and commission an electrified reactor capable of capturing 500–1000 tons of CO_2/year.
- Demonstrate the ability for the reactor to produce sufficiently calcined material (85%+) that achieves a 4-day carbonation time under representative, steady state conditions.
- Integrate lime hydration representative of <2,000 kWh/tCO_2 at scale, calcination extent (85%+), hydration extent (70%+) and the integrated performance within the Recipient's pre-commercial DAC facility (85% carbonation in 4 days at steady state).
- Develop an integrated techno-economic analysis demonstrating the feasibility of system sizing as a method of load-following the grid with the objective of achieving at least 25% savings over traditional battery storage at industrial scale (1 MtCO_2/year).

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;
  - Project Location;
  - 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

Exhibit A
Scope of Work
Heirloom Carbon Technologies

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 subrecipients activities in accordance with the requirements of this Agreement.
- Execute and manage site host agreements, and ensure the right to use the project site throughout the term of the Agreement, as applicable. A site host agreement is not required if the Recipient is the site host.
- Notify the CEC in writing immediately, but no later than five calendar days, if there is a reasonable likelihood the project site cannot be acquired or can no longer be used for the project.
- Incorporate this Agreement by reference into each subaward.
- Include any required Energy Commission flow-down provisions in each subaward, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subaward terms.
- Submit a Subaward and Site Letter to the CAM describing the subawards and any site host agreement needed or stating that no subawards or site host agreements are required.
- If requested by the CAM, submit a draft of each Subaward and any Site Host Agreement required to conduct the work under this Agreement.
- If requested by the CAM, submit a final copy of each executed Subaward and any Site Host Agreement.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding subrecipient additions in the terms and conditions).

Products:

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

TECHNICAL ADVISORY COMMITTEE

Subtask 1.11 Technical Advisory Committee (TAC)

- The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to: Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:

  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the Agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support, and relationships with a national spectrum of influential leaders.
- Ask probing questions that ensure a long-term perspective on decision-making and progress toward the project's strategic goals.

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

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

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.12.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Exhibit A
Scope of Work
Heirloom Carbon Technologies

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

*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. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.*

TASK 2: PRE-COMMERCIAL REACTOR DESIGN

The goal of this task is to design a pre-commercial scale electric calciner reactor with the capability to process roughly 500–1,000 kg CO_2/hour. The design should incorporate innovative features for energy efficiency improvement of 24% and optimal material processing, including but not limited to in-line lime hydration and reactor configuration.

Subtask 2.1 Reactor Design

The Recipient shall:

- Develop detailed high-level design schematics, including dimensions, material choices, and engineering blueprints.
- Demonstrate that the design complies with safety standards and regulatory requirements.

Subtask 2.2 Civil and Structural Design

The Recipient shall:

- Develop civil and structural design specifications including plot plans, detailed civil and structural drawings, and associated blueprints for integrating the calciner within the larger pre-commercial facility.
- Demonstrate that the reactor design complies with safety standards and regulatory requirements, including the Occupational Safety and Health Administration (OSHA), California Environmental Quality Act (CEQA), and relevant city building codes.
- Complete a *Project Design Memo for Reactor* that includes high-level, non-confidential information on system design (i.e. calciner).
- Prepare a CPR Report #1 and participate in a CPR Meeting, per subtask 1.3.

Products:
- Project Design Memo for Reactor
- CPR Report #1 (draft and final)

TASK 3: LIME HYDRATION DESIGN
The goal of this task is to design an integrated system for the hydration of CaO to $Ca(OH)_2$, calcination extent (85%+), hydration extent (70%+), reducing energy requirement and enhancing the reactor's overall efficiency and output quality.

Subtask 3.1 Hydrator Design

The Recipient shall:
- Develop a hydration process that integrates with the calciner reactor and allows for minimal operator assistance and downtime.
- Produce a high-level Computer Aided-Design (CAD) schematic for the hydration system.
- Demonstrate calcination extent is sufficient to move materials directly to the hydration system with the reactor design and operation.
- Design instrumentation for monitoring and controlling the hydration process;

Subtask 3.2 Material Handling and Processing Design
- Design efficiency mechanisms for the transfer of CaO from the calciner to the hydration system. Mechanisms to potentially include but not be limited to:
    - Direct material conveyance from calcination to hydration
    - Direct steam output from the hydration process sent to the calciner
- Demonstrate the mechanism can uniformly disperse CaO in the hydration unit at a consistent rate.
- Complete a *Project Design Memo for Hydration Unit* that includes but is not limited to; high-level, non-confidential information on system design.

Products:
- Project Design Memo for Hydration Unit

TASK 4: PRE-COMMERCIAL REACTOR CONSTRUCTION
The goal of this task is to build the pre-commercial electric reactor based on the finalized design.

Subtask 4.1 Supplier Engagement and Procurement / Site Preparation

The Recipient shall:

- Develop a *Site Preparation Memo* including a bill of materials that includes a procurement plan, anticipated timeline, for reactor fabrication that includes but not limited to:
    - Material Infeed equipment
    - Material Outfeed equipment
    - Filters and cyclones for gas processing
    - Gas processing system.
- Procure all necessary materials and components per design specifications.
- Coordinate with suppliers and contractors to ensure timely and efficient construction.
- Ensure acquisition of all permit approvals (see Subtask 1.8).
- Complete an *Equipment Procurement Memo* demonstrating that all equipment and materials have been procured and all permits approved, and relevant progress updates for all equipment, materials, and permits needed for the project.

Products:

- Site Preparation Memo
- Equipment Procurement Memo

Subtask 4.2 Construction

The Recipient shall:

- Manage construction of reactor at Recipient's pre-commercial facility. This includes but not limited to:
    - Forming and pouring foundations
    - Installation of structural steel for the reactor tower
    - Installation of electrical panels and corresponding wiring
    - Installation of instruments and corresponding piping
    - Installation of stairs/egress path
    - Installation of conveyance piping
- Assemble the reactor, ensuring all components are correctly installed and functional.
- Implement quality control checks throughout the construction process and document progress. This includes but not limited to:
    - Confirmation of layout of foundations and structure
    - Confirmation that concrete is adequately cured before loading the pad
    - Leak checks on pipes
    - Testing of electrical panels
    - Regular site safety audits
- Complete *Equipment Installation Memo,* to include the scope of the planned installation, photographs of the installed equipment and a construction retrospective.

Products:

- Equipment Installation Memo (draft and final)

TASK 5: PRE-COMMERCIAL REACTOR COMMISSIONING

The goal of this task is to verify reactors are built to specifications, test all reactor systems, and complete system commissioning.

Subtask 5.1 Build Verification

The Recipient shall:

- Complete a *Build Verification Report* certifying that the reactor system was built to specifications. This includes:
    - Comparing built system against designed system and targets, including but not limited to designed calcination extent target of 85%+, designed feed rates and reactor performance
        - Verifying wire routing is complete.
        - Completing an Input/Output (I/O) checkout.
        - Verifying functional Human Machine Interface.

Products:

- Build Verification Report (draft and final)

Subtask 5.2 Operational Qualifications

The Recipient shall:

- Develop a *Test Plan* to ensure all systems operate as expected. The test plan shall outline the process to ensure: i) all control devices can operate through their desired ranges including metrics and targets; and ii) machine states can be transitioned to include, but not be limited to the following metrics and targets:
    - All control devices can operate through their desired ranges
    - Machine states can be transitioned
- Conduct a series of dry runs to test the reactor without processing material. The series of dry runs shall include, but not be limited to:
    - Machine can startup properly
    - Machine can shutdown properly
    - Machine interface displays all control device status and state while in dry–cycle
    - Machine can abort during the process and recover
- Calibrate instruments and control systems.
- Train staff on reactor operation and safety procedures. These training procedures shall include but not limited to:
    - Operators have been LOTO trained
    - Operators are aware of required PPE, have it available, and know how to use it
    - Operators are trained on how to safely operate equipment
    - Operators are trained in basic procedures
    - Adequate signage is present
    - Operators are trained to understand alarms

Products:

- Test Plan

Subtask 5.3 Performance Qualification

The Recipient shall:

- Characterize system performance, including validating key subsystems such as (but not limited to) calcination extent (85%+), hydrate extent (70%+), and rate of feed into the reactor (~500 kg CaCO3 per hour).

- Complete the *Commissioning Report* that includes high-level data on commissioning tests.

Products:
- Commissioning Report (draft and final)
- CPR Report #2 (draft and final)

TASK 6: INITIAL TESTING OF PRE-COMMERCIAL REACTOR PERFORMANCE
The goal of this task is to verify the pre-commercial reactor meets performance metrics that enable overall project outcomes. Performance metrics include but are not limited to calcination extent (85%+) and hydration extent (70%+).

Subtask 6.1 Initial Reactor Trials

The Recipient shall:
- Test the reactor capacity (how much material is needed to achieve calcination extent target) and operational stability under varying loads (material feed rates and gas input).
- Collect and analyze data on:
    - Calcination extent
    - Emissions levels- It must be a 25 percent or greater reduction of facility-level GHG emissions

Subtask 6.2 Reactor Operation Optimization

The Recipient shall:
- Adjust and test operational parameters to optimize system performance. The key performance parameters for optimization and data collection are:
    - Throughput [~ 500 kg $CaCO_3$ per hour]
    - Energy consumption [No target for installation, target for integrating with hydration]
    - Calcination efficiency [85%+]
    - Carbonation (CO_2 uptake) performance [85% carbonation in 4 days at steady state]
- Finalize nominal operating parameters.
- Prepare a high-level *Performance Report* documenting non-confidential objectives and key findings on protocols applied to test the performance and operational parameters,

Products:
- Performance Report (draft and final)

TASK 7: INTEGRATION AND TESTING OF LIME HYDRATION SYSTEM
The goal of this task is to integrate the lime hydration system with the calciner reactor and test the combined system's efficiency and output quality, through the calcination extent (85%+) and hydration extent (70%+).

Subtask 7.1 Installation and Commissioning of Lime Hydrator

The Recipient shall:

- Install the hydration system and integrate with the calciner
- Complete initial testing to verify mechanical and operational performance.
- Complete *Equipment Installation Memo* for the lime hydration system that includes the following:
    - photographs of the installed system.
    - Verification that the lime hydration unit was built to CAD specifications.
    - Verification that the equipment is capable of operating as designed.

Products:

- Equipment Installation Memo

Subtask 7.2 Performance Qualification

The Recipient shall:

- Characterize system performance through calcination extent, hydration extent, and mass balance of feed to reduce/minimize material entrainment (material getting stuck in the reactor).
- Complete qualification testing to validate the integration of the hydration unit with the calciner reactor.

Subtask 7.3 Initial Performance Testing

The Recipient shall:

- Complete initial performance testing. Document performance results in a *Performance Report*, which includes but is not limited to,
    - Evaluation of impact on key performance indicators, including,
        - Throughput [~ 500 kg $CaCO_3$ per hour]
        - Energy consumption [< 2,000 kWh/tCO_2 at scale]
        - Calcination efficiency [85%+]
        - Hydration efficiency [70%+]
        - Carbonation (CO_2 uptake) performance [85% carbonation in 4 days at steady state]
- Prepare a *Summary Presentation of Initial Test Results* and findings for discussion with TAC and CEC at the Task 7 CPR meeting.
- Prepare a CPR Report #3 and participate in a CPR meeting, per subtask 1.3

Products:

- Summary Presentation of Initial Test Results (draft and final)

TASK 8: SYSTEM OPERATION, MEASUREMENT, AND VERIFICATION

The goal of this task is to verify the energy savings and GHG emissions reductions from the new process/equipment/optimizations (including but not limited to entrainment reduction, material feed rate, and calcination extent) compared to the baseline performance of the existing system's energy usage.

Subtask 8.1 System Ramp

The Recipient shall:

- Develop *Measurement and Verification (M&V) Plans*.
- Develop a reactor operations strategy that includes but not limited to production planning, test runs, and strategies to minimize the amount of turn-off, in line with the *M&V Plans.*
- Adjust system operations towards a steady and regular (consistent) operating state, through performance optimization and scaling strategies.

Subtask 8.2 Measurement and Verification

The Recipient shall:

- Develop baseline scenarios for energy consumption and GHG emissions based on current DAC processes using fossil-driven equipment and/or modeled Recipient processes using fossil-driven equipment.
- Baseline scenarios will be developed with Carbon Engineering estimates. Model six (6) months of baseline operational data (energy consumption, GHG emissions, operating costs) based on baseline scenarios.
- Complete *Pre-Installation M&V Findings Report*
- Collect 6–12 months of post-installation data, including energy consumption, fossil fuel usage reduction, GHG emissions, and operating costs. The findings must show a 25 percent or greater reduction in fossil fuel use from equipment electrification, a 25 percent or greater reduction of facility-level GHG emissions, a 10 percent or greater reduction in operational and maintenance costs and a simple payback of under three years.
- Complete *Draft* and *Final Post-Installation M&V Finding Report*.

Products:

- M&V Plan (draft and final)
- Pre-Installation M&V Findings Report (draft and final)
- Post-Installation M&V Finding Report (draft and final)

TASK 9: EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project. This project will inform the DAC process and energy efficiency, by providing the Recipient the ability to understand of how calcination works in the reactor, and how to best limit and/or reduce energy consumption based off overall system learnings.

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 10: TECHNOLOGY TRANSFER ACTIVITIES

The goal of this task is to ensure the technological 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 but not limited to:
    - 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 technology's deployment.
    - 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 with 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 the annual EPIC symposium(s) sponsored by the California 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.
- Complete a *Technical Publication* for public distribution in an open-source, peer-reviewed publication.
- Present non-confidential project results at industry forums and conferences.
- Engage with the local community through Community Governance Huddles, local events, and the development of a K-8 educational curriculum.
    - Produce a *Community Engagement Memo* summarizing activities and outcomes of the above.

Products:

- Project Case Study Plan (draft and final)
- Summary of TAC Comments
- Project Case Study (draft and final)
- High Quality Digital Photographs
- Technical Publication (draft)
- Community Engagement Memo

V. PROJECT SCHEDULE

Please Excel spreadsheet.

California Environmental Quality Act

INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION, CITY COUNCIL RESOLUTION NO. 2012-75, 2024 ADDENDUM TO THE INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION, DETERMINATION OF THE COMMUNITY AND ECONOMIC DEVELOPMENT DIRECTOR

Cut and paste the link below into a web browser to view the documents listed above:

CEQA Documents

State of California **California Natural Resources Agency**

M e m o r a n d u m

For: Heirloom Carbon Technologies

From: Maryam Haddad, Ph.D., Air Pollution Specialist Energy Research and Development Division California Energy Commission

715 P Street

Sacramento, California 95814

Date: February 25, 2025

Subject: California Environmental Quality Act Analysis for Agreement EPC-24-021, Heirloom Carbon Technologies "Demonstration of a Pre-Commercial, Electrified Thermal Reactor with Integrated Lime Hydration for use in Direct Air Capture" project

I. Introduction

I am an Air Pollution Specialist in the Energy Research and Development Division of the California Energy Commission (CEC). I am the Commission's Agreement Manager for the proposed grant Agreement EPC-24-021, titled "Demonstration of a Pre-Commercial, Electrified Thermal Reactor with Integrated Lime Hydration for use in Direct Air Capture" with Heirloom Carbon Technologies.

I. Proposed Project

The CEC is considering funding the Recipient's new electrified calciner reactor[1], under EPIC grant agreement EPC-24-021. The proposed project supports CO_2 removal research, with the calciner expected to capture between 500 and 1,000 tons of CO_2 annually. The proposed project will also include a 165-foot-tall calciner tower. The proposed project will be built at the 241-acre site within the City of Tracy's Sphere of Influence north of the city limits. The project site includes an existing 1.2 MGD desalination plant that treats wastewater from the City of Tracy's adjacent Wastewater Treatment Plant (WWTP) located immediately southeast of the project site.

Other activities include trenching for utilities, excavation, installation of pipe racks, and fabrication of structural steel for the reactor tower. The calciner will not emit any odors, and operational emissions are expected to remain consistent with baseline conditions.

[1] The Recipient's project code-named for the electrified calciner reactor is "WonderWoman".

The proposed addition will also not generate new noise beyond existing levels. The overall project will not result in significant changes to the environmental impact previously analyzed and mitigated in the previously approved 2012 IS/MND.

II. City's Environmental Review

The City of Tracy (City), as lead agency, approved and adopted an IS/MND (SCH # 2011122004) for the Tracy Desalination and Green Energy Project on May 1, 2012. The City also made mitigation measures a condition of project approval. The City subsequently approved a first addendum to the IS/MND in December 2022, that involved the addition of a carbon dioxide removal facility on the project site. Recently, the City approved a second addendum (2025 Addendum) to the IS/MND in January 2025, that describes and analyzed the addition of a calciner reactor and office building to the project site.

The revised Tracy Desalination and Green Energy Project involves a series of upgrades to the previously approved desalination plant, including the addition of an electrified downer calciner, which supports CO_2 removal research. This new reactor will be accompanied by a 5,000-square-foot office/warehouse space for R&D teams.

The City of Tracy has reviewed the proposed revisions to the Tracy Desalination and Green Energy Project under the California Environmental Quality Act (CEQA) guidelines, specifically Section 15162, which addresses the need for an Addendum or a Subsequent MND. The City has determined that the changes to the project do not result in new significant environmental impacts or a substantial increase in the severity of previously identified impacts. Based on this analysis, it has been concluded that an Addendum is the appropriate environmental document to address the environmental effects of the project revisions.

The Addendum includes the analysis of the revised project components, including the electrified calciner reactor and office/warehouse space. The analysis confirms that no new impacts have been identified, and the existing mitigation measures remain effective in reducing potential environmental impacts to a less-than-significant level. The revisions do not require the preparation of a Subsequent MND because they do not introduce any new substantial environmental effects or necessitate new or modified mitigation measures.

III. Responsible Agency Considerations

As a responsible agency, the CEC must consider the environmental effects of the revised project as presented in the Addendum. Under CEQA, the preparation of a subsequent environmental document is not necessary unless there are substantial changes to the project that would result in new significant environmental effects or a substantial increase in the severity of previously identified effects. The CEC has reviewed the Addendum and

other relevant documents and determined that the project's proposed revisions do not trigger the need for further environmental review.

The proposed project will continue to operate in accordance with previously adopted mitigation measures, ensuring that no new significant environmental impacts arise. Based on the information provided in the Addendum and compliance with CEQA guidelines, the project will proceed without the need for additional environmental analysis.

This memo analyzes and documents the consideration of the City's IS/MND and addenda and the environmental impacts of the proposed calciner reactor.

IV. Discussion

Aesthetics:

The proposed project includes the addition of a 165-foot-tall tower enclosed by a chain-link fence. These modifications will integrate with the previously analyzed project and not introduce any new visual impacts. The IS/MND requires the implementation of Mitigation Measure 1, which mandates the development of a lighting plan to minimize light spillage and nighttime lighting impacts. This mitigation measure will continue to be enforced for the revised project. No additional mitigation measures are needed for these changes.

Therefore, CEC finds that the proposed project will not lead to any new or increased impacts on aesthetics or visual resources.

Agricultural and Forest Resources:

The project will continue to comply with Mitigation Measure 2, which mandates the payment of Agricultural Mitigation Fees to compensate for the loss of Prime and Unique Farmland if the future solar array component is developed. This mitigation measure will remain in effect and will be enforced. No additional mitigation measures are necessary due to the project revisions. The area of disturbance will remain the same, and there will be no new effects on agricultural lands or resources beyond what has already been discussed in the IS/MND.

Therefore, CEC finds that the proposed project changes will not create new or altered impacts on agricultural or forest resources.

Air Quality:

The air quality impacts associated with the revised project would be similar to those assessed in the IS/MND. The revised project includes a calciner that could require one truck trip per week and may generate an additional 15 worker vehicle trips per day. These

changes would not significantly increase air emissions or impact air quality. Additionally, the energy required for the carbon dioxide removal facilities would be minimal and would not worsen air quality issues, as compared to the analysis in the IS/MND.

The proposed facility would not emit odors and has been deemed exempt from Rule 2020 by the San Joaquin Valley Air Pollution Control District (SJVAPCD). According to the SJVAPCD, with a proposed throughput of 1,931 tons of limestone per year, the facility qualifies as a Low Emitting Unit and is not expected to pose a health risk, as confirmed in a letter from the SJVAPCD dated August 12, 2024.

Construction-related emissions would remain minimal. The revised project will be subject to Mitigation Measures 3 and 4, which require the implementation of best management practices during construction and grading, in compliance with SJVAPCD Rule VIII. No new mitigation measures are required.

Therefore, CEC finds that the project revisions would not lead to significant increases in air quality impacts, and no new mitigation measures are necessary.

Biological Resources:

The revised project's footprint and disturbance area will remain unchanged compared to the conditions outlined in the IS/MND. Therefore, there will be no new impacts on biological resources. The IS/MND requires the implementation of Mitigation Measures 5 and 6, which ensure that the project obtains coverage under the San Joaquin Multi-Species Conservation Plan (SJMSCP) and prevents adverse impacts on burrowing owls. These measures will continue to be effective for the project revisions and will help minimize potential impacts to a less-than-significant level. No new mitigation measures are necessary.

The project site is home to various sensitive plant species, including Joshua trees and alkali mariposa lilies, but measures will be taken to minimize impacts on these species. The live Joshua trees are not expected to be removed during construction, and a suitable buffer will be established around them. If any trees must be removed, mitigation measures will be implemented per the Joshua Tree Habitat Conservation Act. Similar mitigation measures will be applied for the alkali mariposa lily, ensuring that impacts remain less than significant.

Although desert kit foxes, legless lizards, and bird nests were not observed during surveys, there is potential for these species to be present when construction begins. Therefore, mitigation measures will be enacted to ensure any potential impacts are less than significant. With the incorporation of these measures, the impact on sensitive plant and wildlife species will remain below significant levels.

Therefore, CEC finds that the impacts on biological resources are less than significant and there will be no adverse effects on sensitive or special-status species, riparian habitats, wetlands, or wildlife movement.

Cultural Resources and Tribal Cultural Resources:

The IS/MND includes Mitigation Measure 7, which outlines standard procedures to follow if previously unknown cultural or historical resources are discovered during site grading and construction. This mitigation measure will continue to be required for the revised project, ensuring that any impacts remain less than significant. No additional mitigation measures are necessary for the project revisions.

Therefore, CEC finds that the footprint of the project and the areas proposed for disturbance will remain consistent with those analyzed in the IS/MND. Therefore, the potential impacts to cultural resources from the proposed project revisions will not change.

Geology and Soils:

The IS/MND includes Mitigation Measures 8 and 9, which require site-specific geotechnical engineering solutions to comply with the California Building Code, ensuring that structures and foundations meet safety and stability standards. These mitigation measures will continue to apply under the proposed revisions, effectively reducing potential impacts to a less-than-significant level. No new mitigation measures are necessary.

Therefore, CEC finds that the footprint of the project and the areas designated for disturbance will remain the same as analyzed in the IS/MND. Consequently, the potential impacts on geology and soils from the proposed project revisions will not differ from those described in the IS/MND.

Greenhouse Gases:

Under the proposed project revisions, greenhouse gas (GHG) emissions are expected to decrease compared to the originally proposed project. The revised project includes a carbon dioxide removal facility, called *WonderWoman*, which will directly capture GHGs from the atmosphere. Additionally, the facility is anticipated to operate using renewable energy sources.

While the revised project may result in a slight increase in vehicle trips compared to what was initially analyzed in the IS/MND, it is expected that the carbon removal activities will offset these emissions, leading to an overall net reduction in GHGs. Therefore, the proposed revisions are in line with state efforts to expand the supply of renewable fuels.

Given the expected reduction in GHG emissions and the alignment of the revisions with statewide renewable fuel goals, the CEC finds that the project revisions will not exacerbate the severity of impacts related to GHGs.

Hazards and Hazardous Materials:

The IS/MND specifically addresses the use, storage, and transport of hazardous materials regulated under the California Accidental Release Prevention (CalARP) program, with a particular focus on anhydrous ammonia used in the Selective Catalytic Reduction (SCR) system to reduce nitrogen oxide (NOx) emissions.

The IS/MND includes Mitigation Measure 10, which requires the preparation of a Risk Management Plan (RMP) for the use and storage of anhydrous ammonia. This ensures compliance with all applicable regulations. This mitigation measure will still be in effect for the project revisions, guaranteeing that there is no significant increase in risks associated with hazardous materials. Therefore, no new mitigation measures are necessary, and the potential impacts remain less than significant.

Therefore, CEC finds that the proposed project revisions will not lead to any significant changes in the potential impacts related to hazards and hazardous materials, as outlined in the IS/MND.

Hydrology and Water Quality:

The IS/MND includes Mitigation Measure 11, which requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP) before any grading activities begin. This measure will continue to apply to the revised project, ensuring that potential impacts on water quality remain less than significant, as outlined in the IS/MND. No new mitigation measures are necessary for the revised project.

Therefore, CEC finds that the revisions to the project will not alter the area of disturbance, the project footprint, or the grading and drainage improvements compared to what was analyzed in the IS/MND.

Land Use and Planning:

The project site has already been annexed into the City of Tracy, and both the General Plan Amendment and zoning for the site have been approved, designating it as Industrial and Light Industrial. Therefore, the project revisions will not cause any changes to land use or planning impacts. Additionally, no new mitigation measures are required.

Therefore, CEC finds that the proposed revisions to the project will not lead to any new or significantly increased impacts related to land use and planning.

Mineral Resources:

The IS/MND concluded that there would be no significant impacts on mineral resources, and this conclusion still holds with the proposed revisions. As a result, no new mitigation measures are necessary, and no additional impacts on mineral resources are expected.

Therefore, CEC finds that the revisions to the project will not alter the project's footprint or the area of disturbance.

Noise:

The project site is situated in an agricultural and industrial area with relatively high ambient noise levels, and the nearest sensitive receptors are approximately 0.5 miles away.

The revisions introduce additional activities in the northwest corner of the site, including the installation of a calciner. This may result in infrequent truck trips, approximately once per week, as well as an additional 15 worker vehicle trips per day. However, these additional vehicle trips are not anticipated to significantly raise noise levels. The noise generated by the facility itself is expected to be minimal and will not impact nearby sensitive receptors.

Therefore, CEC finds that the project revisions are not expected to significantly change noise impacts compared to the IS/MND analysis, nor will they require new mitigation measures.

Population and Housing:

The IS/MND indicates that the proposed project will not directly lead to population growth and will not convert land for housing development. The project site does not contain any existing homes or residences, meaning no housing would be displaced by the project. As a result, the findings related to population and housing in the IS/MND remain unchanged, and the project revisions will not worsen any impacts concerning this topic. Therefore, no new mitigation measures are needed for the project revisions.

Therefore, CEC finds that the project is not expected to create a significant number of new jobs that could indirectly contribute to population growth.

Public Services and Recreation:

The IS/MND indicates that the project will not significantly impact public services, including police, fire, schools, parks, or other public facilities. The proposed revisions to the project will not introduce new impacts on these public services nor worsen any existing impacts outlined in the IS/MND. Therefore, there is no change in the impact analysis regarding public services and recreation, and no new mitigation requirements are needed for the project revisions.

Therefore, CEC finds that the proposed revisions will not create new impacts on public services or worsen existing ones.

Transportation and Traffic:

The IS/MND concluded that the project would not significantly impact transportation facilities or the nearby roadways and intersections. The original project was projected to generate approximately 20 truck trips per day, distributed throughout the day and not

concentrated during peak travel hours. In the worst-case scenario, this could involve up to 14 additional vehicle trips per hour, including 9 employee trips and 5 truck trips.

The revised project, which now includes a calciner and a carbon dioxide removal facility, is expected to generate about one additional truck trip per week and up to 15 additional vehicle trips per day. These new trips are not anticipated to significantly affect traffic levels or degrade service on local roads or intersections.

The project revisions will not significantly increase transportation and traffic impacts or exacerbate any previously identified issues. Therefore, no new mitigation measures are required for these project changes.

Utilities and Service Systems:

According to the IS/MND, the proposed project will not cause significant impacts on utilities, including water, sewer, drainage, or solid waste services. The revisions to the project will not create new utility impacts or exacerbate any existing impacts identified in the IS/MND. As a result, the impacts related to utilities and service systems remain the same, and no new mitigation measures are necessary for the project revisions.

Therefore, CEC finds that the revisions will not introduce new utility impacts or worsen those already identified in the IS/MND.

V. Conclusion

The CEC has concluded that the proposed project will not create any new significant or substantially more severe environmental impacts that were not previously considered and addressed in the IS/MND and addenda. As a result, no new mitigation measures are required, and the environmental impacts can be mitigated to less than significant.