



**CALIFORNIA
ENERGY COMMISSION**



**California Energy Commission
April 10, 2025 Business Meeting
Backup Materials for NOYA PBC, DBA NOYA INC.**

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

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

[PROPOSED]

RESOLUTION NO: 25-0410-11b

STATE OF CALIFORNIA

**STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION**

RESOLUTION: NOYA PBC, DBA NOYA 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 CRI-24-004 with NOYA PBC, DBA NOYA INC. for a \$996,822 grant. This project will take place in Alameda County and will improve the performance of amine-based sorbents used in direct air capture facilities. With minimized oxidative and thermal degradation during each capture cycle, the new sorbent will achieve a sub-5 percent degradation rate over 100 capture cycles and reduce the cost of capture by over 30 percent; 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 April 10, 2025.

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: CRI-24-004

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Tannis Abdoli
3. MS-:51
4. Phone Number: 916-461-5460

C. Recipient's Information

1. Recipient's Legal Name: Noya PBC, dba Noya Inc.
2. Federal ID Number: 85-1524502

D. Title of Project

Title of project: Integrating Amine-Based DAC Sorbents on Activated Carbon for Energy-Efficient Regeneration by Joule-Heating

E. Term and Amount

1. Start Date: 4/10/2025
2. End Date: 12/31/2027
3. Amount: \$996,822.00

F. Business Meeting Information

1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 4/10/2025
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Maryam Haddad
5. Time Needed for Business Meeting: 5 minutes
6. The email subscription topic is: Energy Research and Development

Agenda Item Subject and Description:

NOYA PBC, DBA NOYA INC. Proposed resolution approving agreement CRI-24-004 with NOYA PBC, DBA NOYA INC. for a \$996,822 grant and adopting staff's recommendation that this action is exempt from CEQA. This project in Alameda County will improve the performance of amine-based sorbents used in direct air capture (DAC) facilities. With minimized oxidative and thermal degradation during each capture cycle the new sorbent will achieve a sub-5% degradation rate over 100 capture cycles and reduce the cost of capture by over 30%. (CRISP funding) Contact: Maryam Haddad

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":

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.

California Code of Regulations, title 14, section 15301 provides that projects which consist of the operation, repair, maintenance, permitting, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, and which have negligible or no expansion of existing or former use, are categorically exempt from the provisions of the California Environmental Quality Act (CEQA). This project involves the operation of existing laboratory facilities to create a novel amine-based sorbent for use in direct air capture (DAC) facilities. The project consists of bench-scale laboratory development of a high-performing solid sorbent that consists of an amine as an active ingredient on an extruded activated carbon support. In a lab setting the project will include demonstration and validation of sorbent cyclic capacity. Therefore, this project is exempt from the requirements of CEQA under section 15301.

California Code of Regulations, title 14, section 15306 provides that projects which consist of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from the provisions of CEQA. This project involves the operation of a laboratory to conduct data collection, research, and experimental management related to the testing of amine-based sorbents for use in direct air capture facilities. Therefore, this project is exempt from the requirements of CEQA under section 15306.



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.

b) Agreement **IS NOT** exempt.

IMPORTANT: consult with the legal office to determine next steps.

No

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

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

H. Is this project considered "Infrastructure"?

No

I. Subcontractors

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

Delete any unused rows from the table.

Subcontractor Legal Company Name	CEC Funds	Match Funds
DOE- Lawrence Livermore National Laboratory	\$ 250,000	\$0

J. Vendors and Sellers for Equipment and Materials/Miscellaneous

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

Vendor/Seller Legal Company Name	CEC Funds	Match Funds
Halma plc	\$6,832	\$0
Associated Environmental Systems, Inc.	\$50,000	\$41,653



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CEC-270 (Revised 01/2024)

350Solutions, Inc.	\$0	\$41,150
Calgon Carbon Corporation	\$1,400	\$0
Airgas, Inc.	\$223	\$0
Chemglass Life Sciences LLC	\$238	\$0
Minerals Technologies Inc.	\$18	\$0
Lab Alley LLC	\$1,725	\$0
Swagelok Company	\$1,163	\$0

K. Key Partners

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

Key Partner Legal Company Name
DOE- Lawrence Livermore National Laboratory

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	23-24	303.307	\$ 996,822

TOTAL Amount: \$ 996,822

R&D Program Area: ICMB: IAW

Explanation for "Other" selection Not applicable

Reimbursement Contract #: Not applicable

Federal Agreement #: Not applicable

M. Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Daniel Cavero

Address: 1901 Poplar St

City, State, Zip: Oakland, CA 94607-2310

Phone: 619-208-7537

E-Mail: daniel@noya.co

2. Recipient's Project Manager

Name: Sal Bednarz



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CALIFORNIA ENERGY COMMISSION

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

Address: 1901 Poplar St

City, State, Zip: Oakland, CA 94607-2310

Phone: 510-735-6016

E-Mail: sal@noya.co

N. Selection Process Used

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

Selection Process	Additional Information
Competitive Solicitation #	GFO-24-303
First Come First Served Solicitation #	Not applicable
Other	Not applicable

O. Attached Items

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

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

Approved By

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

Agreement Manager: Tannis Abdoli

Approval Date: 2/4/2025

Branch Manager: Cody Taylor

Approval Date: 2/5/2025

Director: Jonah Steinbuck (delegated to Branch Manager)

Approval Date: n/a

Exhibit A
Scope of Work
Noya PBC dba Noya Inc.

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR¹	Task Name
1		General Project Tasks
2		Prepare a Series of Activated Carbon Extrudates for Testing with Amine Sorbent
3		Improve Thermal Stability of Amines Infiltrated Into Carbon Extrudates
4	x	Improve Oxidation Resistance and Material Lifetime of Amine-Functionalized Sorbents
5	x	Test Amine-Functionalized Activated Carbon Materials for Cyclic Stability In Breakthrough Analyzer
6		Upgrade Benchtop System to Include Temperature and Humidity Control, Bringing It Up to TRL 5
7	x	Test amine-functionalized activated carbon materials in a TRL 5 environment
8		Measure and verify project performance
9		Develop Community Benefits Plan Development Proposal (CBPDP)
10		Evaluation of Project Benefits
11		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CBP	Community Benefits Plan
CEC	California Energy Commission
CO ₂	Carbon Dioxide
CPR	Critical Project Review
DAC	Direct Air Capture (of carbon dioxide)
kWh	Kilowatt hour
LCA	Life cycle assessment
LLNL	Lawrence Livermore National Lab
MT	megatonne
mmol	One thousandth of a mole
PEI	Polyethyleneimine

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.

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Acronym/Term	Meaning
TAC	Technical Advisory Committee
TEA	Techno-economic assessment
TRL	Technology Readiness level

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the development of amine sorbents for their application in direct air capture (DAC) of carbon dioxide (CO₂) using the Recipient's proprietary absorption and regeneration technology platform. The resulting sorbent system will bring the system energy requirements $\leq 1,731$ kWh/MT CO₂, and the prolonged lifetime of the sorbent component will lead to a reduction in the cost associated with capturing and sequestering CO₂.

Problem/ Solution Statement

Problem

Amines are known for their ability to chemisorb CO₂ and for their low energy requirements to release CO₂ during regeneration, which makes them great candidates as sorbents for DAC. However, for amines to be feasible for DAC, the system in which amines are to be implemented must prevent the oxidative and thermal degradation commonly observed for amine sorbents.

Oxidative degradation of amines is a result of their reaction with atmospheric oxygen during regeneration, which is typically performed at elevated temperatures. Thermal degradation is a result of the volatility of amines.

Solution

The Recipient's DAC platform provides a sorbent environment that minimizes the thermal and oxidative degradation of amines by a) using Joule-heating to control the sorbent temperature and b) by preventing air exposure of the sorbent at elevated temperatures. The Recipient's collaborators at Lawrence Livermore National Laboratory (LLNL) will modify existing amine sorbents to increase oxidative and thermal stability.

B. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to develop a high-performing solid sorbent for direct air capture of CO₂ that consists of an amine as an active ingredient on an extruded activated carbon support.

- Design the sorbent such that it captures at least 1 mmol CO₂ /g sorbent.
- Design the sorbent such that the system energy requirements to capture and regenerate CO₂ is less than 1,731 kWh/MT CO₂.
- Design the sorbent such that the capture capacity loss over 100 capture cycles is less than 5%.
- Reduce baseline cost of capture by 30% or greater with a plan to achieve \$100/MT of CO₂ equivalents by 2032

Agreement Objectives

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Noya PBC dba Noya Inc.

The objectives of this Agreement are to:

- Demonstrate sorbent cyclic capacity by validating the integration of amine-based sorbents with activated carbon, showcasing thermal and oxidative stability with less than a 5% drop in capture capacity (mmol CO₂/g) over 100 cycles.
- Achieve CO₂ capture capacity exceeding 1.0 mmol/g and system energetics at or below 1,731 kWh/ton on a technology readiness level (TRL) 5 testing device.

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**

Exhibit A
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Noya PBC dba Noya Inc.

- 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.

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Scope of Work

Noya PBC dba Noya Inc.

The Kick-off meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Terms and conditions of the Agreement;
 - Invoicing and auditing procedures;
 - Travel;
 - Equipment purchases;
 - Administrative and Technical products (subtask 1.1);
 - CPR meetings (subtask 1.3);
 - Monthly Calls (subtask 1.5)
 - Quarterly Progress reports (subtask 1.6)
 - Final Report (subtask 1.7)
 - Match funds (subtask 1.8);
 - Permit documentation (subtask 1.9);
 - Subawards(subtask 1.10);
 - Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
 - Agreement changes;
 - Performance Evaluations; and
 - Any other relevant topics.
- Provide *Kick-off Meeting Presentation* to include but not limited to:
 - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
 - Project schedule that identifies milestones
 - List of potential risk factors and hurdles, and mitigation strategy
 - Provide an *Updated Project Schedule, Match Funds Status Letter, and Permit Status Letter*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Kick-off Meeting Presentation
- Updated Project Schedule (*if applicable*)
- Match Funds Status Letter (subtask 1.7) (*if applicable*)
- Permit Status Letter (subtask 1.8) (*if applicable*)

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive CEC funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the CEC and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and

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Scope of Work
Noya PBC dba Noya Inc.

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

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Noya PBC dba Noya Inc.

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.

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The Recipient shall:

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

Product:

- Email to CAM concurring with call summary notes.

Subtask 1.6 Quarterly Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:

- Submit a *Quarterly Progress Report* to the CAM. Each progress report must:
 - Summarize progress made on all Agreement activities as specified in the scope of work for the reporting period, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Progress reports are due to the CAM the 10th day of each January, April, July, and October. The Quarterly Progress Report template can be found on the ECAMS Resources webpage available at: <https://www.energy.ca.gov/media/4691>
- Submit a monthly or quarterly *Invoice* on the invoice template(s) provided by the CAM.

Recipient Products:

- Quarterly Progress Reports
- Invoices

CAM Product:

- Invoice template

Subtask 1.7 Final Report

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

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

Subtask 1.7.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Energy Commission Style Manual* provided by the CAM.

Recipient Products:

- Final Report Outline (draft and final)

CAM Products:

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

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- 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

Exhibit A
Scope of Work
Noya PBC dba Noya Inc.

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.

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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.
- 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.

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- 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:

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

The Recipient shall:

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

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.12 TAC Meetings

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

The Recipient shall:

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

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- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that ensure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Subtask 1.13 Project Performance Metrics

The goal of this subtask is to finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the project performance metrics section of the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
 - TAC comments the Recipient proposes to incorporate into the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
 - TAC comments the Recipient does not propose to incorporate with and explanation why.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the Recipient met each of the performance metrics in the *Final Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
- Discuss the *Project Performance Metrics Results* at the Final Meeting.

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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: Prepare A Series of Activated Carbon Extrudates for Testing with Amine Sorbent

The goal of this task is to synthesize activated carbon substrates with different surface properties for amine grafting. We plan to produce a matrix of activated carbon extrudates that covers the four possible variations of the carbon source, and the activation method based on commercially available products.

The Recipient shall:

- Test various types of carbon by source (wood-based vs bitumen-based) and activation method (steam activated vs chemical activated)
- Test various types of binders (bentonite vs methylcellulose)
- Extrude rods of 0.5-inch diameter with these compositions using a commercial extruder (Diamond America TF400EZ)
- Dry the extrusions.
- Calcine the extrusions.
- Formulate a *Summary of the Eight Extrusion Compositions* for amine impregnation and consisting of activated carbon, extrusion binder, and water. A description of the synthesis process including extrusion compositions, extrusion parameters, and post-synthesis procedures, such as drying.

Products:

- Summary of the Eight Extrusion Compositions

TASK 3: Improve Thermal Stability of Amines Infiltrated into Carbon Extrudates

The goal of this task is to improve the thermal stability of the sorbent. The focus of Task 3 is to overcome thermal degradation of amine sorbents during regeneration. The two main strategies to solve this problem are altering the chemistry and molecular weight of the amine-bearing polymer and changing the surface chemistry and porosity of the carbon. Both strategies will either decrease the volatility of the amine component or increase its interaction strength with the carbon surface, improving the thermal stability of the resulting sorbent.

The Recipient shall:

- Characterize the carbon formulations synthesized in Task 2 to assess the type and concentration of functional groups, such as hydroxides and carboxylic acids, that are suitable for amine grafting
- Test a variety of polymeric amines for their ability to be physically attached to carbon supports. Understand the influence of polymer (chemistry, molecular weight) and carbon

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(surface area, porosity, surface chemistry, functional groups) on the carbon-amine attachment process.

- Test alternative means of improving carbon-amine interactivity, including:
 - coating of aluminum or silicon oxide onto carbon support²
 - Introduction of carboxylic acids onto carbon surface to act as tethering points for hydrogen bonding with the aminopolymer or as potential grafting sites for short-chain amines.³
- Test the thermal stability of physically- and chemically-attached amines at elevated temperatures and reduced pressures, replicating the adsorption-regeneration conditions of a typical capture process.
- Produce a Carbon-Amine Composite capable of temperature-vacuum swing adsorption under inert conditions.
- Determine Joule-heatability of the resulting formulations.
- Prepare *Composite Characterization Report* that includes the synthesis of the composite and characterization data, including regeneration testing and thermal stability.

Products:

- Composite Characterization Report

TASK 4: Improve Oxidation Resistance and Material Lifetime of Amine-Functionalized Sorbents

The goals of this task are to design and characterize carbon-amine sorbents with enhanced oxidative stability and assess the oxidative stability of carbon-amine sorbents under relevant environmental and process conditions.

Building on the carbon-amine composite obtained in Task 3, Task 4 will further stabilize the sorbent by increasing oxidative stability. Strategies to increase oxidative stability include chemical modification of polyethyleneimine (PEI) and testing of PEI alternatives that have shown superior oxidative stability, such as polypropyleneimine and polyallylamine.

The Recipient shall:

- Synthesize carbon-amine composites based on modified PEI with additives to either induce additional hydrogen bonding with the PEI's amines, e.g., hydroxyl-containing polymers⁴, or react amine groups with increased oxidation susceptibility, e.g., 1,2-epoxybutane⁵.

² Zhang, Y.; Li, X.; Wang, L.; Chen, H.; Liu, J.; Zhao, Y.; Wang, Y.; Zhang, S.; Wang, H.; Li, J. High-Performance Solid-State Lithium–Sulfur Batteries Enabled by a Multifunctional Cathode Interlayer. *Joule* 2023, 7 (5), 1056–1070

³ Amirhossein Houshmand; Wan Mohd Ashri Wan Daud; Min-Gyu Lee; Mohammad Saleh Shafeeyan. *Water, Air, Soil Pollut.* 2012, 223 (2), 827–835

⁴ Chanjot Kaur; Abdelhamid Sayari. *Chem. Eng. J.* 2024, 496, 153756.

⁵ Sichi Li; Marcos F. Calegari Andrade; Anthony J. Varni; Glory A. Russell-Parks; Wade A. Braunecker; Elwin Hunter-Sellers; Maxwell A. T. Marple; Simon H. Pang. *Chem. Commun.* 2023, 59, 10737–10740

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- Synthesize carbon-amine composites using alternative aminopolymer formulations to PEI, e.g., poly(propyleneimine)⁶ and poly(allylamine).⁷
- Characterization of the carbon-amine composites using spectroscopy
- Test Joule-heatability of the resulting formulations.
- Prepare *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings) and include the status of activities completed in Task 4, description of results, challenges, and how they were overcome.
- Participate in a CPR meeting.

Products:

- CPR Report #1

TASK 5: Test Amine-functionalized Activated Carbon Materials for Cyclic Stability in Breakthrough Analyzer

The goal of the task is to perform cyclic testing of sorbent formulations for CO₂ capture and release under environmental conditions.

The Recipient shall:

- Build a breakthrough analyzer with cyclic capabilities. At the heart will be a fixed bed reactor that can be filled with up to one gram of the sorbent material and can be exposed to a variety of temperatures and atmospheric conditions. The reactor will be complemented with precise mass flow controllers and infra-red gas analyzers
- Test sorbent formulations described in tasks 2 and 3 under controlled conditions (temperature and relative humidity during exposure).
- Conduct cyclic testing, in which one cycle includes capture and regeneration. The process will be repeated such that sorbent performance can be determined over many cycles.
- Compile a *Test Report* inclusive of each sorbent's capture capacity and regeneration capacity over a number of cycles. This allows us to assess the long-term stability of the sorbent materials and rate the different sorbent materials by long-term performance.
- Prepare *CPR Report #2* and participate in a CPR meeting.

Products:

- Test Report
- CPR Report #2

⁶ Pang, S. H.; Arellano-Treviño, M. A.; Chapman, W. G.; Miller, S. J.; Hwang, S.-J.; Jones, C. W. Design of Aminopolymer Structure to Enhance Performance and Stability of CO₂ Sorbents: Poly(propyleneimine) vs Poly(ethyleneimine). *J. Am. Chem. Soc.* 2017, 139 (10), 3627–3630

⁷ Sumit Bali; Simon H. Pang; Ryan P. Lively; Christopher W. Jones. *Energy Fuels* 2013, 27 (3), 1547–1554

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TASK 6: Upgrade Benchtop System to Include Temperature and Humidity Control to Achieve TRL 5

The goal of this task is to increase the fidelity of the testing system such that testing can be done on the target sorbent formulations with a wide range of inputs and more precise quantification of results.

The Recipient shall:

- Purchase temperature and humidity control equipment.
 - A walk-in climate test chamber for retrofitting has been identified as a low risk and low-cost method of controlling temperature and humidity for this task.
- Install and commission walk-in climate test chamber at Noya headquarters, which includes the following steps:
 - Site preparation, positioning, assembly, pre-commissioning, startup testing, and performance validation.
 - Inform the TAC of installation plans and provide a *Summary of TAC Installation and Performance Recommendations*
- Retrofit the existing benchtop system (TRL-4) with this equipment, which includes:
 - An outlet and an inlet (return) port on the walk-in climate testing chamber and fans to move the air into the existing system.
 - Temperature control to the return line with an inline heater.
 - Connecting lines between the TRL-4 system and the new climate test chamber.
 - Thermal insulation
 - A “fresh-air” replenishment line with a small compressor to ensure the chamber’s internal CO₂ concentration does not drop below ambient levels.
 - Calibration of all sensors including CO₂ concentration sensors.
 - Install a pre-validated sorbent cylinder.
 - Modify the existing control system to operate the new fan.
- Commission the new system with K₂CO₃ sorbent and benchmark the device's performance.
- Summarize before and after system performance characteristics in a *TRL 5 System Summary* to justify TRL increase from TRL 4.

Products:

- Summary of TAC Installation and Performance Recommendations
- TRL 5 System Summary

TASK 7: Test Amine-Functionalized Activated Carbon Materials in a TRL 5 Environment

The goal of this task is to further evaluate candidates that showed promising results in tasks 3-5, now in a TRL 5 setup. This testing introduces Joule-heating as the means of increasing the sorbent temperature for regeneration and vacuum atmosphere during the regeneration process.

The Recipient shall:

- Extrude, dry, and calcine full sized hollow cylinders to fit the TRL 5 device with the Diamond America extruder.
- Coat the hollow cylinders with the amine.

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- Apply contacts to the sorbent.
- Install the new sorbent into the TRL-5 device.
- Run 100 cycles to show improved capture capacity and decreased degradation.
- Prepare a *CPR Report #3* and participate in a CPR meeting.

Products:

- CPR Report #3

TASK 8: Measure and Verify Project Performance

The goal of this task is to measure the project benefits, as indicated by the kWh required per kg of CO₂ captured, showing improved energy efficiency.

The Recipient shall:

- Engage an independent third party (350Solutions, Inc.) to measure and quantify system performance at the beginning and at the end of the project.
- Develop a *Measurement and Verification Report* to quantify energy efficiency performance, including data files with CO₂ concentration sensor readings and mass flow meter readings for each test cycle.

Products:

- Measurement and Verification Report

TASK 9: Life Cycle Assessment (LCA), Techno-Economic analysis (TEA) and Community Benefits Plan

The goal of this task is to evaluate the impact of the proposed project on techno-economics and the environment by conducting a Life Cycle Assessment (LCA) and a techno-economic analysis (TEA). Additionally, the recipient will create a preliminary community education and outreach plan for the proposed DAC prototype. The outcomes of these analyses will then be broadly disseminated to demonstrate the efficacy of deploying this technology within the California DAC sector.

The Recipient shall:

- Use published protocols to develop TEA and LCA models.
- Incorporate performance and manufacturing data into TEA and LCA models
- Assess the techno-economic and environmental impacts of this project on the recipient's technology platform
- Prepare a *TEA Report* and an *LCA Report* to be delivered to the industrial partner and CEC.
- Discuss the outcomes of TEA and LCA analyses with the industrial partner to detect/identify any new roadblocks to on-site deployment at batch plants uncovered through these analyses and include findings in the Mitigation Plans Memo.
- Prepare a *Mitigation Plans Memo* that addresses any risks or no-go issues uncovered through TEA and LCA.

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- Create a *Community Benefits Plan Development Proposal* (CBPDP) as a part of their final deliverables upon the completion of the project. This CBPDP must include but not limited to:
 - project's plan for outreach and engagement, including community partners
 - a list of community partners for future outreach and engagement
 - a list of potential impacts, including waste-water and any other pollutants, from operating the Recipient's DAC systems
 - approaches for negotiating future Community Benefits Agreements and integrating stakeholder and community feedback to develop and improve ongoing engagement
 - a list of potential benefits to propose to community members as part of future Noya DAC projects
 - approaches for negotiating CBP's, including one-on-one conversations with other carbon removal companies that have already negotiated CBP's

Products:

- TEA Report
- LCA Report
- Mitigation Plans Memo (draft & final)
- Community Benefits Plan Development Proposal (draft & final)

TASK 10: Evaluation of Project Benefits

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete the *Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by January 31st of each year. The Annual Survey includes but is not limited to the following information:
 - Technology commercialization progress
 - New media and publications
 - Company growth
 - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the [Energize Innovation website](http://www.energizeinnovation.fund) (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](http://www.energizeinnovation.fund) (www.energizeinnovation.fund), and provide

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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 11: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to conduct activities that will accelerate the commercial adoption of the technology being supported under this agreement. Eligible activities include, but are not limited to, the following:

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

The Recipient Shall:

- Develop and submit a *Technology Transfer Plan* that identifies the proposed activities the recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the draft *Technology Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the Draft Technology Transfer Plan. This document will identify:
 - TAC comments the Recipient proposes to incorporate into the final *Technology Transfer Plan*.
 - TAC comments the Recipient does not propose to incorporate with an explanation why not.
- Submit the final *Technology Transfer Plan* to the CAM for approval.
- Implement activities identified in final *Technology Transfer Plan*.
- Develop and submit a *Technology Transfer Summary Report* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the Final Technology Transfer Plan. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

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Products:

- Technology Transfer Plan (draft and final)
- Summary of TAC Comments
- Technology Transfer Summary Report (draft and final)
- High Quality Digital Photographs

IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.