California Energy Commission
April 10, 2025 Business Meeting
Backup Materials for Build Momentum (d.b.a. Momentum)

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: 25-0410-12

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: **Build Momentum (d.b.a. Momentum)**

RESOLVED, that the State Energy Resources Conservation and Development Commission (CEC) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the CEC approves agreement EPC-24-045 with Build Momentum for the first phase of an up to $17,000,000 grant. This agreement will fund demonstration and deployment of technologies and strategies to advance the state of end-use demand response and load flexibility in California's industrial, agricultural, and water (IAW) sectors through the IAW Demand Flexibility Research and Deployment Hub, which will convene California's leading research institutions and research partners. This agreement will initially provide $10,602,855 for the first phase consisting of four demonstration projects, electricity load profile characterization and IAW market assessment, stakeholder engagement, and technology and knowledge transfer activities, and up to an additional $6,397,145 may be added, with approval through an amendment; 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

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-24-045

B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Akruti Gupta
3. MS-:53
4. Phone Number: (916) 232-9191

C. Recipient's Information

1. Recipient's Legal Name: Build Momentum (d.b.a. Momentum)
2. Federal ID Number: 90-1072948

D. Title of Project

Title of project: Industrial FlexHub: Advancing Demand Load Flexible Technologies in Industrial, Agriculture, and Water

E. Term and Amount

1. Start Date: 5/12/2025
2. End Date: 3/31/2031
3. Amount: $17,000,000.00

F. Business Meeting Information

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

Agenda Item Subject and Description:

Build Momentum (d.b.a. Momentum) Proposed resolution approving agreement EPC-24-045 with Build Momentum (d.b.a. Momentum) for the first phase of an up to $17,000,000 grant and adopting staff's recommendation that this action is exempt from CEQA. This agreement will fund demonstration and deployment of technologies and strategies to advance the state of end-use demand response and load flexibility in California's industrial, agricultural, and water (IAW) sectors through the Hub, which will convene California's leading research institutions and research partners. This agreement will initially provide $10,602,855 for the first phase consisting of four demonstration projects, electricity load profile characterization and IAW market assessment, stakeholder engagement, and technology and knowledge transfer activities, and up to an additional $6,397,145 may be added, with approval through an amendment. (EPIC funding) Contact: Matthew Fung. (10 minutes).

G. California Environmental Quality Act (CEQA) Compliance

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

   If yes, skip to question 2.

   If no, complete the following (PRC 21065 and 14 CCR 15378) and explain why Agreement is not considered a "Project":

   Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because:

2. **If Agreement is considered a "Project" under CEQA answer the following questions.**
   a) Agreement **IS** exempt?

      Yes

      Statutory Exemption?
      No

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

      PRC section number: None

      CCR section number: None

      Categorical Exemption?
      Yes

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

      CCR section number: Cal. Code Regs., tit. 14, § 15301 and § 15306.

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

      If yes, explain reason why Agreement is exempt under the above section. If no, enter "Not applicable" and go to the next section.

      The administration of IAW Hub activities will be carried out in existing offices, exempt under 14 C.C.R. sections 15301. Demonstration and deployment of technologies and strategies to advance the state of end-use demand response and load flexibility in California's industrial, agricultural, and water (IAW) will take place at known and yet-to-be determined IAW facilities. Changes in facility controls to shift electrical load are unlikely to change the emissions to environmental media (i.e., air, water, land disposal), but they may do so. This agreement will initially provide $10,602,855 for the first phase consisting of four demonstration projects, electricity load profile characterization and IAW market assessment, stakeholder engagement, and technology and knowledge transfer activities. For the already-identified, four demonstration projects, the activities are exempt under 14 C.C.R. sections 15301 and 15306, as described below. For additional, not-yet-identified demonstration sites, the Recipient will provide the CEC with recommended site addresses and descriptions, and environmental information for CEC review, and respond to CEC inquiries about environmental considerations. Activities and spending associated

with the up to $6,397,145 in additional funding may be approved by the CEC in one or more amendments, only if each proposed site demonstration requires no other local government discretionary permits, and also if the proposed site activities are exempt under the California Environmental Quality Act, in the judgment of the CEC.

California Code of Regulations, title 14, section 15301: For each demonstration project, there will be no planned land disturbance, and the activities includes only modifications to control systems and load management technologies at existing facilities. For each demonstration project, there will be no expansion of the existing use of the facility, and there will not be a significant effect on the environment.

Cal. Code Regs., tit. 14, Section 15306 provides that projects which consist of basic data collection, research, experimental management, and resource evaluation activities, and which do not result in a serious or major disturbance to an environmental resource are categorically exempt from the provisions of the California Environmental Quality Act. This project falls within these parameters.

The project will not impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2 apply to this project, and this project will not have a significant effect on the environment.

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

No

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

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

H. Is this project considered “Infrastructure”?

No

I. Subcontractors

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

Subcontractor Legal Company Name	CEC Funds	Match Funds
The Regents of the University of California, on behalf of its Davis Campus	$ 2,869,020	$ 601,078
The Regents of the University of California as Management and Operating Contractor for the Ernest Orlando Lawrence Berkeley National Laboratory	$ 3,004,179	$ 800,000
Electric Power Research Institute, Inc.	$ 2,440,397	$ 264,000
EDF Innovation Lab, Inc.	$ 99,603	$ 11,067
Cerenzia Foods, Inc.	$ 0	$ 200,000
Southern California Edison Company	$ 0	$ 1,260,000
TBD (Future Demonstration Project Implementation)	$ 500,000	$ 0
DNV Energy Insights USA Inc	$ 707,599	$ 0
California State University, Fresno Foundation	$ 807,145	$ 0
Physicians, Scientists, and Engineers for Sustainable and Healthy Energy, Inc.	$ 850,009	$ 0
The Leland Stanford Junior University	$ 1,000,000	$ 0
City of Santa Barbara	$ 0	$ 368,948
Siemens Industry, Inc.	$ 480,701	$ 700,000
Pacific Gas & Electric Company	$ 0	$ 400,000

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
Capitola Design	$ 167,520	$ 0
Doug Cupid Photography LLC	$104,872	$0
Annectsys, Inc. (d.b.a. IC Systems)	$ 99,000	$ 0
Cascade Energy, LLC	$ 35,500	$ 0
The MathWorks, Inc.	$ 30,500	$ 0
Portal Solutions	$ 75,000	$ 0

Wikler Consulting LLC	$ 30,000	$ 0
TBD (California State University, Fresno Foundation employing engineering services for future demonstration project)	$ 25,000	$ 0
Amazon Web Services, Inc.	$ 303,000	$ 0
TBD (UC Davis submitting to Peer-Reviewed Publication)	$ 21,000	$ 0
TBD (UC Davis employing Event Producers for Symposiums)	$ 40,000	$ 0
TBD (UC Davis employing Photographers for Symposiums)	$ 2,000	$ 0
TBD (UC Davis purchasing sensors and communication equipment)	$ 99,980	$ 0
TBD (EPRI purchasing connection equipment and other supplies and materials for future demonstration projects)	$ 105,000	$ 36,000
TBD (EPRI purchasing controls system, virtual end nodes, monitoring equipment, controls, and sensors for future demonstration projects)	$ 250,000	$ 0
TBD (California State University, Fresno Foundation purchasing equipment for future demonstration project)	$ 150,000	$ 600,000
TBD (California State University, Fresno Foundation purchasing supplies for installation of equipment for future demonstration project)	$ 15,000	$ 0
CBRE, Inc.	$ 15,120	$ 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
Innovative Cold Storage Enterprises, Inc. (Demonstration Partner)

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	$ 16,000,000
EPIC	25-26	TBD	$ 1,000,000

TOTAL Amount: $ 17,000,000

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: Matt Hart

Address: 801 K St Ste 2800 Suite 2800

City, State, Zip: Sacramento, CA 95814-3522

Phone: 916-444-3863

E-Mail: matt@buildmometum.io

3. Recipient’s Project Manager

Name: Sophia Racke

Address: 801 K St Ste 2800 Suite 2800

City, State, Zip: Sacramento, CA 95814-3522

Phone: 949.899.0444

E-Mail: sophia@buildmomentum.io

N. Selection Process Used

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

Selection Process	Additional Information
Competitive Solicitation #	GFO-23-316
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

Item Number	Item Name	Attached
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: Akruti Gupta

Approval Date: 02/28/2025

Branch Manager: Kevin Uy for Cody Taylor

Approval Date: 02/28/2025

Director: Kevin Uy for Jonah Steinbuck

Approval Date: 02/28/2025

EXHIBIT A
Scope of Work
Build Momentum

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Hub Administration and Coordination
3	X	IAW Market Assessment
4		Community Framework
5		Measurement and Verification
6	X	Individual Demonstration Projects
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
API	Application Program Interface
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CAISO	California Independent System Operator
CEC	California Energy Commission
CIP	Community Impact Plan
CPR	Critical Project Review
DAC	Disadvantaged Communities
DR	Demand Response
IAW	Industrial, Agriculture, and Water
IOU	Investor-Owned Utilities
LI	Low Income
LSE	Load Serving Entity
M&V	Measurement and Verification
MIDAS	Market Informed Demand Automation Server
SCE	Southern California Edison
TAC	Technical Advisory Committee
UC	University of California

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

A. Purpose of Agreement

The purpose of this Agreement is to demonstrate and deploy technologies and strategies to advance the state of end-use demand response (DR) and load flexibility in California's industrial, agricultural, and water (IAW) sectors through the Hub, which will convene California's leading research institutions and research partners. The Hub will enable efficient knowledge transfer across both research and industry partners to rapidly advance the technology readiness

[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.

of load flexibility technologies and strategies. The demonstration and deployment of such solutions are relevant to increasing the reliability of the grid while supporting California's environmental and decarbonization goals.

B. Problem/ Solution Statement

Problem

California's IAW sectors are some of the largest energy consumers in the state, with highly predictable loads and robust potential for broad coordination. However, they face significant barriers to adopting demand flexibility technologies due to limited operational research, high implementation costs, and insufficient advanced controls. While technologies that enable demand flexibility exist at various levels of development in other sectors, they have not been optimized for the diverse, dynamic, and high-energy needs of the IAW sectors. Dedicated research and coordination are needed to address these gaps. Specifically, demonstrations to validate the economic value and operational utility of these technologies are essential to increase the uptake of these strategies that can aid California to meet its climate and clean energy targets, including the statewide load shift goal of 7000 MW by 2030.

Solution

To advance commercialization and adoption of demand flexibility technologies and strategies in the IAW sectors, the value proposition and energy performance must be improved in a way that mutually benefits all stakeholders. The purpose of the Hub is to uncover and address multi-sector gaps in knowledge and technology and share these across internal research teams and external stakeholders. A multidisciplinary research team of California's experts under the umbrella of the Hub would be able to develop, demonstrate, and deploy advanced demand flexibility technologies specifically designed for the IAW sectors. A comprehensive, strategic, and systemic approach to technology and knowledge transfer that is a crucial element of the Hub could maximize the impact of this project beyond the scope of the demonstration projects. The Hub's dynamic approach will also aid in responding to potential changes in markets and technology development, among other factors, in a timely way that would allow for meaningful contributions to California's statutory energy and decarbonization goals.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Conduct research and deployments of demand flexibility technologies and strategies in California's IAW subsectors, such as wastewater, food processing, and chemical processing and manufacturing among others, to accelerate demand flexibility solutions.
- Build a community framework to deliver benefits and advancements to California's disadvantaged and low-income communities at the front lines of the climate crisis.
- Demonstrate and deploy a variety of advanced demand flexibility technologies and strategies with demonstration projects aligned with California's climate and energy goals.
- Inform current, ongoing, and future policies related to DR and load flexibility, as well as associated socioeconomic benefits, decarbonization efforts, and GHG emissions abatement work.
- Identify broader operational and demand flexibility potential by analyzing sector and sub-sector load shapes.

- Develop and refine technology supporting advanced pricing signals, such as dynamic utility rates. Enroll in a dynamic or real-time pricing pilot program, a wholesale, LSE, or third-party Load Flexibility or Demand Response program, or the Emergency Load Reduction Program. Use the Market Informed Demand Automation Server (MIDAS) where feasible when using a price server.
- Foster innovation in the development of cost-effective and cyber-secure DR solutions that increase operational flexibility and resilience in IAW sectors.
- Model current and anticipated grid and customer needs to deliver a suite of solutions and recommendations to serve California through its decarbonization.
- Advance the state of the sector to ensure policy and markets are mutually informative, responsive, and effective through technology and knowledge transfer.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of:

- Greater electricity reliability by enabling and expanding DR and load flexibility to support the continued stability of California's electricity grid during peak demand periods, outages, and the transition to a grid that meets California's electrification and decarbonization goals.
- Lower costs by shifting, shimmying, shaping, and shedding energy usage to off-peak periods or adjusting loads in response to real-time pricing signals which can reduce operational and infrastructure costs for businesses and utilities. Advanced load management decreases the need for expensive peaking power plants, reduces grid congestion, and lengthens the timeline to add new generation and expand energy storage, leading to lower wholesale electricity prices and, consequently, lower costs for ratepayers. Furthermore, optimizing energy use based on dynamic pricing allows IAW consumers to take advantage of cost-effective electricity rates, providing direct financial savings and improving overall economic efficiency within the market.
- Increased safety by increasing resilience of critical infrastructure, supporting the goals and objectives of relevant price signals (such as emergency preparedness, lowering costs, or reducing emissions of harmful pollutants among other objectives), and improving automation and cybersecurity measures that can protect infrastructure. Demand response and load flexibility measures enhance safety by increasing the resilience of critical infrastructure, such as water treatment facilities, during emergencies like wildfires or extreme heat events, ensuring these essential services remain operational. By reducing peak demand and minimizing reliance on fossil-fuel peaking plants, which emit harmful pollutants and are often located near disadvantaged communities, these technologies improve air quality and mitigate associated health risks. Advanced automated controls and cybersecurity measures ensure safe, secure, and gradual load adjustments, preventing equipment failures, accidents, and unplanned outages, ultimately protecting both infrastructure and public health.

[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).

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 improving signal-responsive technologies for the IAW sectors, enabling advanced load flexibility solutions that integrate real-time grid signals for optimized energy usage. By focusing on cybersecurity and automation, the project advances the readiness of secure and scalable technologies for widespread adoption. The Hub will document best practices and performance data, facilitating standardization and policy alignment. These efforts support California's climate objectives, including the 7,000 MW load shift target, by providing reliable DR solutions tailored to the state's diverse sectors.

Agreement Objectives

The objectives of this Agreement are to:

- Quantify the demand flexibility potential within the IAW sectors by analyzing sector-specific load shapes and identifying operational flexibilities.
- Complete at least five individual projects across at least five different subsectors over the course of the project term. These individual projects, the first five of which must be approved within the first two years of Hub administration, will constitute a diverse portfolio in the context of IOU service territory, geography, and California Climate Zones, and in providing benefits to disadvantaged (DAC) and low-income communities.
- Develop a standardized M&V protocol for the performance and scalability of demand flexibility technologies, ensuring consistent, comparable results across the ten projects.
- Research and deploy at least 10 advanced signal-responsive technology solutions that incorporate price signals, greenhouse gas emissions data, and cybersecurity features, with a focus on leveraging MIDAS as a central data source, where applicable.
- Document best practices, costs, and performance metrics for the deployed technologies, establishing a clear value proposition for stakeholders, including customers, building owners, ratepayers, load-serving entities, aggregators, and grid operators.
- Share technical knowledge through workshops, publications, and stakeholder engagement activities to promote technology standardization, reduce customer and infrastructure costs, and accelerate market adoption of demand flexibility solutions.
- Integrate equity considerations into project selection and deployment to ensure that the benefits of demand flexibility technologies reach disadvantaged communities and sectors most impacted by legacy energy systems.
- Engage policy stakeholders and regulatory bodies to align the outcomes of the projects with state and federal policy objectives, supporting the integration of demand flexibility strategies into California's regulatory framework and energy planning efforts.
- Evaluate innovative rate structures for demand flexibility and reduce financial barriers for IAW facilities implementing these technologies, making adoption economically viable and scalable across diverse operational settings.

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

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). Products that require a draft version are indicated by marking **"(draft and final)"** after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, **"days"** means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

- **Electronic File Format**
  - Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the California Energy Commission's (CEC) software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick.

The following describes the accepted formats for electronic data and documents provided to the CEC as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

- **Software Application Development**
  Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open-source programs:
  - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
  - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
  - Visual Studio.NET (version 2008 and up). Recommend 2010.
  - C# Programming Language with Presentation (UI), Business Object and Data Layers.
  - SQL (Structured Query Language).
  - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
  - Microsoft SQL Reporting Services. Recommend 2008 R2.
  - XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the CEC's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, and other CEC staff relevant to the Agreement. The Recipient's Project Manager and any other individuals deemed necessary by the CAM or the Project Manager shall participate in this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., Teams, Zoom), with approval of the CAM.
  The Kick-off meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Travel;
  - Equipment purchases;

- Administrative and Technical products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Monthly Calls (subtask 1.5)
- Quarterly Progress reports (subtask 1.6)
- Final Report (subtask 1.7)
- Match funds (subtask 1.8);
- Permit documentation (subtask 1.9);
- Obtain and Execute Subawards with Host Sites (subtask 1.10);
- Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
- Agreement changes;
- Performance Evaluations; and
- Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
  - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
  - Project schedule that identifies milestones
  - List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, as needed to reflect any changes in the documents.

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

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

CAM Product:
- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings
The goal of this subtask is to determine if the project should continue to receive CEC funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the CEC and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient and may include the CAO and any other individuals selected by the CAM to provide support to the CEC.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit.
However, the CAM may schedule additional CPR meetings as necessary. The budget may be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement

amount will not increase. CPR meetings generally take place at the CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

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

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* with a list of expected CPR participants in advance of the CPR meeting. If applicable, the agenda may include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a schedule for providing a Progress Determination on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. A determination of unsatisfactory progress This may result in project delays, including a potential Stop Work Order, while the CEC determines whether the project should continue.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)

CAM Products:

- CPR Agenda(s)
- Progress Determination

Subtask 1.4 Final Meeting
The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with CEC staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.
  - The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.

  - The administrative portion of the meeting will involve a discussion with the CAM of the following Agreement closeout items:
    - Disposition of any procured equipment.
    - The CEC's request for specific "generated" data (not already provided in Agreement products).
    - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
    - "Surviving" Agreement provisions such as repayment provisions and confidential products.
    - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide copies of *All Final Products* organized by the tasks in the Agreement.

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

MONTHLY CALLS, REPORTS AND INVOICES

Subtask 1.5 Monthly Calls

The goal of this task is to have calls at least monthly between the CAM and Recipient to verify that satisfactory and continued progress is made towards achieving the objectives of this Agreement on time and within budget.

The objectives of this task are to verbally summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, to verify match funds are being proportionally spent concurrently or in advance of CEC funds or are being spent in accordance with an approved Match Funding Spending Plan, to form the basis for determining whether invoices are consistent with work performed, and to answer any other questions from the CAM. Monthly calls might not be held on those months when a quarterly progress report is submitted or the CAM determines that a monthly call is unnecessary.

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

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

Product:
- Email to CAM concurring with call summary notes.

Subtask 1.6 Quarterly Progress Reports and Invoices
The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

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

Recipient Products:
- Quarterly Progress Reports
- Invoices

CAM Product:
- Invoice template

Subtask 1.7 Final Report
The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC Style Manual provided by the CAM.

Subtask 1.7.1 Final Report Outline

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

Recipient Products:
- Final Report Outline (draft and final)

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

Subtask 1.7.2 Final Report

The Recipient shall:
- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Energy Commission Style Manual, and Final Report Template provided by the

CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (**required**)
    - Credits page on the reverse side of cover with legal disclaimer (**required**)
    - Acknowledgements page (optional)
    - Preface (**required**)
    - Abstract, keywords, and citation page (**required**)
    - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
    - Executive summary (**required**)
    - Body of the report (**required**)
    - References (if applicable)
    - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
    - Bibliography (if applicable)
    - Appendices (if applicable) (Create a separate volume if very large.)
    - Attachments (if applicable)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments on Draft Final Report* received on the Executive Summary. For each comment received, the Recipient will identify in the summary the following:
  - Comments the Recipient proposes to incorporate.
  - Comments the Recipient does not 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

EXHIBIT A
Scope of Work
Build Momentum

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.

EXHIBIT A
Scope of Work
Build Momentum

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) ensure quality products and to execute subawards and site host agreements, as applicable, required to carry out the tasks under this Agreement; and (2) ensure that the subawards are consistent with the terms and conditions of this Agreement and the Recipient's own procurement and contracting policies and procedures.

The Recipient shall:

- Establish and implement a standardized agreement template or a process for negotiating and executing individual agreements with site hosts. The Recipient may utilize a streamlined approach for site host agreements where applicable, such as standardized agreements for common site types (e.g., residential, commercial) or utilizing existing agreements with property owners or managers.
- Execute and manage subawards and coordinate subrecipient 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 that the minimum number of project sites 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 *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 for the CAM to review.
- If requested by the CAM, submit a final copy of each executed subaward and any site host agreement.
- Notify and receive written approval from the CAM prior to adding any new subrecipient (see the terms regarding of subrecipient additions in the terms and conditions).

Products:

- Letter describing the subawards needed, or stating that no subawards are required
- Draft subawards (if requested by the CAM)
- Final subawards (if requested by the CAM)
- Draft site host agreement (if requested by the CAM)
- Final site host agreement (if requested by the CAM)

TECHNICAL ADVISORY COMMITTEE

Subtask 1.11 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

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

- Ask probing questions that ensure a long-term perspective on decision-making and progress toward the project's strategic goals.

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

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

The Recipient shall:

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

Products:

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

Subtask 1.12 TAC Meetings

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

The Recipient shall:

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

- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

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

Products:

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

Subtask 1.13 Project Performance Metrics

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

The Recipient shall:

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

- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:
- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2 HUB ADMINISTRATION AND COORDINATION

The goal of this task is to effectively establish and manage the Hub to enable, coordinate, and optimize research and deployment activities and maximize benefits to IOU ratepayers.

The Recipient shall:
- Develop and submit the *Year 1 Internal Controls, Processes, and Procedures Memo* (*draft and final)* to receive, handle, and account for grant funding, create and enable and effective governance structure and decision-making framework, and coordinate and facilitate effective communication amongst a diverse Project Team. Update as necessary and submit the most updated Memo annually. The Memo should include:
  - Financial management tools and systems
  - Regular cadence for internal communications amongst the project team
  - Process for aggregating research information and sharing data and information
  - Approach to managing business sensitive information
  - Decision making processes and decision-making authority guidelines
- Launch the Hub, according to the Year 1 Internal Controls, Processes, and Procedures Memo.
- Launch external engagement efforts, as defined in Task 8.
- Develop and manage a transparent *Future Demonstration Project Determination Framework Memo* that describes the process for determining future projects to be included in the Hub (see Task 6 for project details).
- Develop and submit *Year 1-5 Future Research Recommendations Memo* informed by the Community Framework (see Task 4 for details), the Load Serving Entity (LSE) Stakeholder Group (see Task 8.2 for details), the Industry Stakeholder Group (see Task 8.2 for details), and the Technology Stakeholder Group (see Task 8.2 for details). Submit memo annually until all projects have been identified.
- Develop and submit the *Year 2-5 Internal Controls, Processes, and Procedures Memo* to receive, handle, and account for grant funding, create and enable and effective governance structure and decision-making framework, and coordinate and facilitate effective communication amongst a diverse Project Team. Update as necessary and submit the most updated Memo annually. The Memo should include:
  - Financial management tools and systems
  - Regular cadence for internal communications amongst the project team
  - Process for aggregating research information and sharing data and information
  - Approach to managing business sensitive information
  - Decision making processes and decision-making authority guidelines
- Report on the progress of the Hub via the Task 1 deliverables.

- Participate in annual program evaluation and review meetings with stakeholders (see Task 8.2 for stakeholder engagement approach) to discuss the annual program report and gather feedback.

Products:

- Year 1 Internal Controls, Processes, and Procedures Memo (draft and final)
- Future Demonstration Project Determination Framework Memo
- Year 1 – Year 5 Future Research Recommendations Memos (5)
- Year 2 – Year 5 Internal Controls, Processes, and Procedures Memos (4)

TASK 3 IAW MARKET ASSESSMENT

The goals of this task are to 1) assess demand flexibility trends and best practices outside California for potential adaptation in California's IAW sectors, 2) utilize CEC's advanced metering data, if available, to analyze industrial load shapes and estimate demand flexibility potential for high-priority subsectors, and 3) identify feasible load shift/shed potential with duration and frequency for these subsectors.

Subtask 3.1 Electricity Load Profile Characterization

This subtask will generate insights regarding present-day IAW electricity load shapes to inform future potential analyses and explore potential changes to these load shapes that may occur due to electrification of industrial processes and other demands.

The Recipient shall:

- Develop and submit a *Load Shape Data Plan* outlining the details of the dataset required to conduct the analysis and a brief overview of the planned analysis, subject to the sole discretion of the CAM and CEC staff.
  - Collaborate with the CEC to assess the permissibility (from the CEC perspective) and usability of data from the CEC's advanced metering infrastructure warehouse, subject to then-current CEC Non-Disclosure Agreement requirements, and Information Practices Act requirements, and determine alternative data sources if needed.
- Analyze customer meter data to understand electricity usage patterns among different customer groups and IAW subsectors, including agriculture, water and wastewater treatment, manufacturing, and internet service providers and data processing services, among others. Describe the methods and report the quantitative results of the analyses described above in a *Load Shape Metrics and Insights Report.* Review and update as needed, in consultation with the CAM and Hub Administrator.
  - Within the above subsectors, the level of aggregation will be determined to break out specific subsectors that are of interest to the IAW Flex Hub (e.g., where demonstrations are being done) and/or subsectors that constitute a significant portion of IAW electricity demand in the state. Subsectors that are within the above categories, but lower priority may be grouped together as an "other" subsector at the discretion of the research team.
  - The analysis may include, but will not be limited to:
    - Definition of prototypical daily load shapes and distribution of said shapes across subsectors, facility sizes, and locations.
    - Quantification of system load coincidence across facilities.
    - Creation of demand variability metrics that inform the generalizability, or lack thereof, of load flexibility analyses and demonstrations.

    - Description of weekly and seasonal operational patterns across subsectors.
- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in CPR meeting #1.

Products:
- Load Shape Data Plan
- Load Shape Metrics and Insights Report
- CPR Report #1

Subtask 3.2 Top-down Load Flexibility Potential Analysis
This subtask will create estimates of IAW load flexibility across the entire state through a top-down approach, breaking down the state-wide load flexibility potential by subsector, region, facility size, and other customer characteristics of interest. The analysis will focus on the technical potential of the load flexibility from the system-wide grid standpoint, meaning it will assess the magnitude of load impacts that might be possible from an operational perspective.

The Recipient shall:
- Develop hourly baseline and forecast load models for a *California IAW Electricity Demand Dataset,* at a geographic and sectoral granularity to be determined by factors including, but not limited to, data availability and confidentiality requirements, feedback from relevant stakeholders who are likely to use the data, and to achieve alignment with other Hub activities. Publish this data consistent with the terms and conditions of this grant agreement, and following LBNL's federal requirements, and following the CEC's best practice and internal controls associated with privacy of sensitive business information (see Task 2 for details) on the publicly available website that will be set up for the Hub.
    - Develop a model for hourly baseline IAW electricity load across the entire state with data from Subtask 3.1 and collaborate with the larger IAW Hub team and CEC to develop methods for this model, where appropriate.
    - Create IAW electricity demand forecasts that account for various economic and electrification scenarios. This includes incorporating insights from DOE projects like the Industrial Decarbonization Roadmap, developing bounding scenarios for agriculture and water sectors and integrating state forecasts from the Integrated Energy Policy Reports.
- Document the methods, results, and key findings from the activities described below in a *California IAW Flexibility Potential Report.*
    - Develop assumptions and scenarios to describe potential flexibility in customer types and end-use loads, considering factors such as shed fraction (percentage of demand shed during DR events), shift window (duration over which load can be moved), round-trip efficiency or thermal loss fraction (energy losses from load shifting), and price elasticity (change in demand based on price differences).
    - Create a flexibility potential model for the IAW subsectors, leveraging existing modeling frameworks for estimating event-based DR (shed and shift), and response to hourly prices using elasticity frameworks.
    - Estimate the technical potential of load flexibility across all customer groups and, where possible, end uses.

Products:
- California IAW Electricity Demand Dataset
- California IAW Flexibility Potential Report

Subtask 3.3 Bottom-up Flexibility and Valuation Case Studies
The goal of this subtask is to conduct a bottom-up analysis of load flexibility technologies and strategies that will make up the statewide potential. This analysis is a more granular, process- and/or facility-specific modeling of load flexibility technologies and strategies being demonstrated in the hub to generate insights regarding the value proposition and/or cost and performance targets of such technologies.

The Recipient shall:

- Work with Hub partners and CEC to identify target technologies for analysis.
- Work with technology demonstration partners to characterize the baseline loads of their target customers and mechanisms by which they will enable load flexibility.
- Develop heuristic load response models to represent the technology response and calibrate models with testing results where feasible.
- Estimate the load response of the technology across a population of target customers, and a range of dynamic price and/or DR program scenarios.
- Calculate the expected bill savings based on existing tariffs or incentive revenues from traditional DR programs of the estimated load response and compare them to the technology's costs to determine the potential value proposition.
- Where possible, expand the case study from select target customers to a comprehensive statewide analysis for the given technologies depending on the agreed upon goals of the task and the number of technologies selected for case studies.
- Document the methods, assumptions, and results of the analysis for each study in a *Technology Valuation Analysis Memo.*

Products:

- Technology Valuation Analysis Memo

TASK 4 COMMUNITY FRAMEWORK
The goal of this task is to assess the impacts of site energy systems on nearby and grid-affected communities, focusing on water and air quality, energy resilience, and job access. These assessments will support the implementation of each site's Community Impact Plan (CIP), with coordinated consultation on community engagement strategies and providing impact analysis. Stakeholder surveys on considered energy technologies will also inform state-scale strategies.

The Recipient shall:

- Develop and document community engagement methodologies in a *Community Engagement Best Practices and Guidance Memo* that will be utilized by individual project teams throughout Task 6, and aid in their implementation.
- Conduct outreach to communities across the state to inform each project's CIP.
  - Conduct outreach to impacted communities to aid in the prioritization of their overarching areas of concern, regardless of relevance to demonstration projects.
  - Report those prioritized areas of concern to each local project team.
  - Track how project teams continue engaging with impacted communities and how they include community areas of concern in project designs and decisions.
- Summarize and aggregate key findings regarding potential community impacts for each site in a *Site-specific Community Impact Report #1 - #4*. In consultation with the CAM and Hub administrator, submit reports per site for all project sites identified.

  - Study each individual project's CIP to help identify local health, economic, and environmental benefits to the DAC and LI communities where the research is being conducted.
  - Consult with individual project sites to ensure community input is being incorporated throughout the process and help identify and quantify potential community impacts from target technologies.
- Aggregate results of CIPs and impacts from target technologies into a *Statewide Summary of Potential Community Impacts Report* to document the potential impacts of IAW demand flexibility at the state scale with consideration of the proximity of facilities to DAC and LI communities.
- Perform a high-level study of the non-energy impacts of existing grid-scale technologies that provide similar energy services, including storage and peaker plants, and document results in *Comparative Study of Grid-Scale Technologies Report*. This summary will help quantify the local and system-wide impacts and trade-offs between several grid-scale technologies and strategies, including demand flexibility strategies, that may be used to meet peak demand.

Products:
- Community Engagement Best Practices and Guidance Memo
- Site-specific Community Impact Reports #1 - #4 (4)
- Statewide Summary of Potential Community Impacts Report
- Comparative Study of Grid-Scale Technologies Report

TASK 5 MEASUREMENT AND VERIFICATION (M&V)
The goal of this task is to develop and implement robust M&V plans for all participating sites consistent with Hub's M&V framework. Through early assessment of technology demand flexibility mechanisms and site-specific load attributes, this task will demonstrate the evaluability of the demand flexibility technologies at each site and facilitate participation in available demand flexibility offerings.

The Recipient shall:
- Prepare the *Hub M&V Framework* that identifies the Hub's approach to consistently gathering adequate and appropriate information from the demonstration sites, which includes but is not limited to:
  - All building automation system data related to both flexible loads and other dynamic loads at sites.
  - Other process or production data correlated with energy use.
  - Price series data received.
  - Information regarding risks to data evaluability that contribute to either exogenous trend or variation not controlled for by the model, which may be addressed within site-level M&V reports.
- Prepare a *Year 1 – 5 Hub M&V Plan* that aggregates the metrics and project benefits that will be measured and quantified for the following year's projects and describes the similarities and differences in the methods to quantify demand flexibility across various sites. Iterate yearly in line with the Future Research Recommendations (see details in Task 2).
- Prepare a *Year 1 – 5 Hub M&V Memo* that aggregates the baselining approaches used across all active projects, provides comparison of different approaches across different conditions, and quantifies the overall peak load shed and load shift across all active

projects. Iterate yearly in line with the Summary of Demonstration Project Results (see details in Task 6).
- Prepare and submit the *M&V Summary and Findings Report* that includes but is not limited to:
  - Feedback and findings on baselining approaches used across projects.
  - Feedback and findings on metrics and project benefits used across projects.
  - Final load reduction estimates from each site across test conditions.
  - Cost reductions associated with implemented demand flexibility measures.

Products:
- Hub M&V Framework (draft and final)
- Year 1 – Year 5 Hub M&V Plans (5)
- Year 1 – Year 5 Hub M&V Memos (5)
- M&V Summary and Findings Report

TASK 6 INDIVIDUAL RESEARCH PROJECT DEMONSTRATIONS
The goal of this task is to demonstrate and deploy signal responsive, cost effective, and scalable demand flexible technologies, with advanced cyber security, in at least five IAW subsectors. The research findings and data collected from this task will be used to assess sector-wide market potential and to assess and make recommendations to improve incentive programs and electricity market structures to enhance grid operations, reduce cost, and advance distributed energy resource functionality.

The Recipient shall:
- Submit a *Year 1 Annual Technology Portfolio and Work Plan* that describes the scopes of the final Year 1 projects in detail, which will be subject to CAM review and approval to start projects as scoped.
- Develop the *Work Plan Framework* that identifies the criteria for refining and updating the annual work plan based on identified research findings, emerging technology capabilities, annual Future Research Recommendations Memos (see details in Task 2), and evolving state policy goals among other identified factors, while also incorporating feedback from the TAC and CAM.
- Demonstrate and deploy signal responsive, cost-effective, and scalable demand flexible technologies, with advanced cyber security, in at least five IAW subsectors at a minimum of 10 different sites in CA IOUs' territories over the term of the agreement.
- Ensure that demonstration sites enroll in a California IOU dynamic or real-time pricing pilot program, a wholesale DR program, an LSE or third-party DR program, or the statewide Emergency Load Reduction Program or Demand Side Grid Support Program.
- Identify a Project Support Group for each demonstration project with the guidance of the project's principal investigator and research team, consisting of a volunteer set of 3 to 5 subject matter experts under Non-Disclosure Agreements who will provide technical advice, insights, and perspectives on research plans and progress.
- Develop, install, commission, operate, and document demand flexibility enabling hardware and/or software technologies required for each demonstration project.
- Collect data for both baseline operations and automation technology enabled demand flexible operations consistent with the M&V Plan (see Task 5 for details).

- Publish research results consistent with the terms and conditions of this grant agreement, and following the CEC's best practice and internal controls associated with privacy of sensitive business information (see Task 2 for details).
- Implement an annual process for selecting and obtaining approval from the CAM for each new demonstration project beyond Year 1.
- Submit a *Year 2-5 Annual Technology Portfolio and Work Plan* annually that utilizes the Work Plan Framework to refine the scope of the Hub for the remainder of the project term, which will be subject to CAM review and approval to start new or continue with existing projects as scoped.
- Submit a *Year 1-5 Annual Summary of Demonstration Project Results* that organizes the findings annually and provides recommendations and lessons learned.
- Prepare a *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in CPR meeting #2.

Products:

- Work Plan Framework
- Year 1 – Year 5 Annual Technology Portfolio and Work Plans (5)
- Year 1 – Year 5 Annual Summary of Demonstration Project Results (5)
- CPR Report #2

Subtask 6.1 Development of Tariffs to Incentivize Load Shifting in the Water Sector and Beyond

The goals of this task are to develop flexible demand management strategies for the water sector, focused on increasing useful electric load during periods of excess renewable energy, and provide information how the developed tariffs and strategies may be applicable to or adapted to other IAW subsectors.

The Recipient shall:

- Prepare and submit a *Project Charter #1* for CAM review and approval, that includes a project overview, scope, goals, objectives, intended outcomes, project benefits, resources and budget, and anticipated costs and benefits.
- Prepare and submit a *Project Schedule #1* including milestones and identify risks and mitigation strategies.
- Prepare a *Project Community Impact Plan #1*, consistent with the Community Engagement Best Practices and Guidance Memo (see Task 4), to identify the local approach to community engagement.
- Prepare a *Project M&V Plan #1* consistent with the Hub's M&V framework (see Task 5), that includes but is not limited to the identification of the metrics and project benefits that will be measured and quantified, assessment of technology evaluability related to data requirements to accurately quantify load flexibility at specific sites, and description of a process to quantify demand reductions provided to the California Independent System Operator (CAISO) or LSE program in which the project is enrolled, including site-level data streams.
- Implement the project consistent with the Community Benefit Plan, Project Charter #1 and Project Schedule #1.
- Prepare site-specific input to the Hub's Technology/Knowledge Transfer work (see details in Task 8 and 8.2).

- Provide written progress updates per Task 1.5 and Task 1.6.

Products:
- Project Charter #1
- Project Schedule #1
- Project Community Impact Plan #1
- Project M&V Plan #1

Subtask 6.1.1 Enroll Water Agencies and Develop a Pilot DR Program
The goal of this task is to identify one or more water agencies in Southern California Edison (SCE) territory willing to participate in electric load shifting, and to design tariff structures to incentive load shifting.[4]

The Recipient shall:
- Outreach to and obtain *Letters of Commitment* from water agencies willing to participate in the pilot program.
- Meet with water agencies in SCE territory to identify incentives that would motivate them to shift electric load.
- Consolidate the identified incentives into a pilot DR program within SCE.
- Enroll selected water agencies into the pilot program.
- Develop a *Pilot DR Program Design Report* that documents the methods of outreach to water agencies, the identified incentives that motivated participation, and the DR program design for this subsector.

Products:
- Letters of Commitment
- Pilot DR Program Design Report (draft and final)

Subtask 6.1.2 Implement the Pilot DR Program at Selected Water Agencies
The objective of this task is to implement the pilot DR program at selected water agencies and to evaluate, monitor and verify (EM&V) the program effectiveness.

The Recipient shall:
- Conduct independent M&V consistent with the Project M&V Plan and provide a *Site-Level Project M&V Report #1* for each site that should include, but is not limited to:
  - Finalize site-level baselining approaches, including at least one basic CAISO settlement baseline and statistical model-based baselines, that will be used to confirm the size of load reduction.
  - Quantify peak load shed/load shift during test events, their duration and time of day. Quantifying the impacts on utility resource adequacy, including a model-based baseline, will provide primary impact estimates and cost-reduction.
  - If using MIDAS and when feasible, collect data on MIDAS usage (Total/Average Application Program Interface (API) calls per unit of time), and the failure rate and information about the failures encountered in the process.

[4] California Public Utilities Commission approved this pilot DR program in Decision Number 23-12-005, published December 14, 2023, pp. 193-229, mimeo, as modified by Decision 24-12-029

- Document research methodology, project outcomes, M&V results, performance insights, research recommendations, scalability considerations, and project benefits in *Project Technical Report and Presentation #1*. While the submission of this report may be before the end of the project term, it will be included as an appendix in the Final Report.
    - If using MIDAS as a price server, assess its functionality, document user experience, and provide feedback to enhance the API as a platform. If using another server, indicate why the server was selected and/or potential areas of improvement in MIDAS.
    - Include, in the report, information on data collection and validation (historical load profiles before Pilot participation), event participation validation, interviews to assess long-term load-shifting investments, load impact analysis, operational load shift strategies and customer system response times, recruitment and implementation risks, DR cost-effectiveness analysis, potential for expanding the Pilot, and compliance costs with CAISO tariff and telemetry requirements.

Products:

- Site-Level Project M&V Report #1
- Project Technical Report and Presentation #1

Subtask 6.1.3 Dissemination of Pilot Results

Our long-term goal is to have all the water utilities in SCE territory engaged in electric load shifting, and to expand participation into the industrial and agricultural sectors.

The Recipient shall:

- Conduct an in-person workshop and a series of webinars targeted at the potable water sector to disseminate findings, seek feedback on further refinement of program design, and enroll additional agencies.
- Conduct several in-person workshops and webinars targeted at the industrial and agricultural sectors to share the Pilot's findings and seek feedback on incentivizing other sectors to participate in electric load shifting.
- Develop a *Pilot DR Outreach and Expansion Report* to document the refined Pilot DR program design based on workshop feedback, list the additional water agencies enrolled in the program, present a roadmap for adapting the program to industrial and agricultural subsectors, and provide insights to guide IOUs in proposing cost-effective and scalable Flex DR programs.

Products:

- Pilot DR Outreach and Expansion Report

Subtask 6.2 Flexible Load and DER Control Platform Demo at an All-Electric Factory

The goal of this task is to develop and demonstrate cost-effective multi-asset demand flexibility and utility cost management at a large all-electric, electrical equipment manufacturing facility. Given the highly sensitive operations of primary processes in factories and other manufacturing facilities, this demonstration will evaluate the impact of multi-asset demand flexibility through simulation-based and in-situ demonstrations.

EXHIBIT A
Scope of Work
Build Momentum

The Recipient shall:

- Prepare and submit a *Project Charter #2* for CAM review and approval, that includes a project overview, scope, goals, objectives, intended outcomes, project benefits, resources and budget, and anticipated costs and benefits.
- Prepare and submit a *Project Schedule #2* including milestones and identify risks and mitigation strategies.
- Prepare a *Project Community Impact Plan #2*, consistent with the Community Engagement Best Practices and Guidance Memo (see Task 4), to identify the local approach to community engagement.
- Prepare a *Project M&V Plan #2* consistent with the Hub's M&V framework (see Task 5), that includes but is not limited to the identification of the metrics and project benefits that will be measured and quantified; assessment of technology evaluability related to data requirements to accurately quantify load flexibility at specific sites; description of a process to quantify demand reductions provided to the CAISO or LSE program in which the project is enrolled, including site-level data streams; whole facility baseline data; time history of baseline data; analytical method and incremental and/or absolute cost data.
- Implement the project consistent with the approved Project Charter #2, Project Schedule #2, and Project Community Impact Plan #2, using a tri-phased approach for technology installation, control algorithm development, and testing to manage multiple DERs and integrations while minimizing production risks.
- Conduct independent M&V consistent with the Project M&V Plan #2 and provide a *Site-Level Project M&V Report #2* for each site that should include, but is not limited to:
    - Finalize site-level baselining approaches, including at least one basic CAISO settlement baseline and statistical model-based baselines, that will be used to confirm the size of load reduction.
    - Quantify peak load shed/load shift during test events, their duration and time of day. Quantifying the impacts on utility resource adequacy, including a model-based baseline, will provide primary impact estimates and cost-reduction.
    - If using MIDAS and when feasible, collect data on MIDAS usage (Total/Average API calls per unit of time), and the failure rate and information about the failures encountered in the process.
- Prepare and submit *Open Documentation of Deployed Control Algorithms* that provide the implemented control algorithms in an open specification, potentially with an accompanying open-source software code reference implementation.
- Document research methodology, project outcomes, M&V results, performance insights, research recommendations, scalability considerations, and project benefits in *Project Technical Report and Presentation #2*, including but is not limited to details of the impact of each managed asset on premise and an evaluation of the phased approach to technology and controls implementation, especially as they relate to the manufacturing process. While the submission of this report may be before the end of the project term, it will be included as an appendix in the Final Report.
    - If using MIDAS as a price server, assess its functionality, document user experience, and provide feedback to enhance the API as a platform. If using another server, indicate why the server was selected and/or potential areas of improvement in MIDAS.
- Prepare site-specific input to the Hub's Technology/Knowledge Transfer work (see details in Task 8 and 8.2).
- Provide written progress updates per Task 1.5 and Task 1.6.

Products:

- Project Charter #2
- Project Schedule #2
- Project Community Impact Plan #2
- Project M&V Plan #2
- Site-Level Project M&V Report #2
- Open Documentation of Deployed Control Algorithms
- Project Technical Report and Presentation #2

Subtask 6.3 Demand Flexibility Tools for Water Utilities

The goal of this task is to develop and test a set of digital tools that enable water utilities to value, assess, and deploy energy demand flexibility. This project will build on the research conducted by the Water and Energy Efficiency for the Environment Lab which was primarily focused on modeling efforts that use advanced optimization tools, by demonstrating these tools at water treatment and supply facility and refining the associated workflows to enable deployment at scale.

The Recipient shall:

- Prepare and submit a *Project Charter #3* for CAM review and approval, that includes a project overview, scope, goals, objectives, intended outcomes, project benefits, resources and budget, and anticipated costs and benefits.
- Prepare and submit a *Project Schedule #3* including milestones and identify risks and mitigation strategies.
- Prepare a *Project Community Impact Plan #3*, consistent with the Community Engagement Best Practices and Guidance Memo (see Task 4), to identify the local approach to community engagement.
- Prepare a *Project M&V Plan #3* consistent with the Hub's M&V framework (see Task 5) that includes but is not limited to the identification of the metrics and project benefits that will be measured and quantified, assessment of technology evaluability related to data requirements to accurately quantify load flexibility at specific sites, and description of a process to quantify demand reductions provided to the CAISO or LSE program in which the project is enrolled, including site-level data streams.
- Develop and distribute the *Emissions-Cost Alignment Tool* to support the design of rate structures that encourage emissions reductions and grid stability for industrial and water sectors.
- Develop an open-source risk-aware *Demand Response Bidding Tool* for water, wastewater, and other risk-averse industrial facilities. This tool will pair with dynamic system models to find optimal DR bids based on the operator's risk tolerance.
- Summarize independent work conducted by the City of Santa Barbara to develop a Water Resources Energy Master Plan that will provide a ranked order estimate of the value of energy flexibility projects within the City's water systems in the *Water Resource Energy Technical Memorandum*.
- Implement the project consistent with the approved Project Charter #3, Project Schedule #3, Project Community Impact Plan #3, and Water Resource Energy Technical Memorandum
- Conduct independent M&V consistent with the Project M&V Plan and provide a *Site-Level Project M&V Report #3* for each site that should include, but is not limited to:

  - Finalize site-level baselining approaches, including at least one basic CAISO settlement baseline and statistical model-based baselines, that will be used to confirm the size of load reduction.
  - Quantify peak load shed/load shift during test events, their duration and time of day. Quantifying the impacts on utility resource adequacy, including a model-based baseline, will provide primary impact estimates and cost-reduction.
  - If using MIDAS and when feasible, collect data on MIDAS usage (Total/Average API calls per unit of time), and the failure rate and information about the failures encountered in the process.
- Document research methodology, project outcomes, M&V results, performance insights, research recommendations, scalability considerations, and project benefits in *Project Technical Report and Presentation #3*. While the submission of this report may be before the end of the project term, it will be included as an appendix in the Final Report.
  - If using MIDAS as a price server, assess its functionality, document user experience, and provide feedback to enhance the API as a platform. If using another server, indicate why the server was selected and/or potential areas of improvement in MIDAS.
  - Use a demand flexibility analysis framework[5] to evaluate how system characteristics affect the performance and value of operational flexibility across various case studies.
- Prepare site-specific input to the Hub's Technology/Knowledge Transfer work (see details in Task 8 and 8.2).
- Provide written progress updates per Task 1.5 and Task 1.6.

Products:
- Project Charter #3
- Project Schedule #3
- Project Community Impact Plan #3
- Project M&V Plan #3
- Emissions-Cost Alignment Tool
- Demand Response Bidding Tool
- Water Resource Energy Technical Memorandum
- Site-Level Project M&V Report #3
- Project Technical Report and Presentation #3

Subtask 6.4 Enhanced Demand Flexibility for Cold Storage
The goal of this task is to develop and test a Model Predictive Control (MPC) System for cold storage systems in food distribution and processing facilities to enhance energy efficiency and load shifting. The MPC system will load energy pricing data, environmental data, and data from the cold storage system into a 'digital twin' model of the system.

The Recipient shall:
- Prepare and submit a *Project Charter #4* for CAM review and approval, that includes a project overview, scope, goals, objectives, intended outcomes, project benefits, resources and budget, and anticipated costs and benefits.

[5] Rao, A.K., Bolorinos, J., Musabandesu, E., Chapin, F.T. and Mauter, M.S., 2024. Valuing energy flexibility from water systems. Nature Water, pp.1-10.

- Prepare and submit a *Project Schedule #4* including milestones and identify risks and mitigation strategies.
- Prepare a *Project Community Impact Plan #4*, consistent with the Community Engagement Best Practices and Guidance Memo (see Task 4), to identify the local approach to community engagement.
- Prepare a *Project M&V Plan #4* consistent with the Hub's M&V framework (see Task 5), that includes but is not limited to the identification of the metrics and project benefits that will be measured and quantified, assessment of technology evaluability related to data requirements to accurately quantify load flexibility at specific sites, and description of a process to quantify demand reductions provided to the CAISO or LSE program in which the project is enrolled, including site-level data streams.
- Implement the project consistent with the approved Project Charter, Project Schedule, and Project Community Impact Plan #4.
  - The site will enroll in an ADR 2.0 DR program.
  - Collect data consistent with the Project M&V Plan and submit at least monthly data that will be delivered through the required project reporting (see Task 1 for details).
- Conduct independent M&V consistent with the Project M&V Plan #4 and provide a *Site-Level Project M&V Report #4* for each site that should include, but is not limited to:
  - Finalize site-level baselining approaches, including at least one basic CAISO settlement baseline and statistical model-based baselines, that will be used to confirm the size of load reduction.
  - Quantify peak load shed/load shift during test events, their duration and time of day. Quantifying the impacts on utility resource adequacy, including a model-based baseline, will provide primary impact estimates and cost-reduction.
  - If using MIDAS and when feasible, collect data on MIDAS usage (Total/Average API calls per unit of time), and the failure rate and information about the failures encountered in the process.
- Document research methodology, development of the digital twin model for the demo site, project results and outcomes, M&V results, performance insights, research recommendations, scalability considerations, and project benefits in *Project Technical Report and Presentation #4*. While the submission of this report may be before the end of the project term, it will be included as an appendix in the Final Report.
  - If using MIDAS as a price server, assess its functionality, document user experience, and provide feedback to enhance the API as a platform. If using another server, indicate why the server was selected and/or potential areas of improvement in MIDAS.
- Prepare site-specific input to the Hub's Technology/Knowledge Transfer work (see details in Task 8 and 8.2).
- Provide written progress updates per Task 1.5 and Task 1.6.

Products:

- Project Charter #4
- Project Schedule #4
- Project Community Impact Plan #4
- Project M&V Plan #4
- Site-Level Project M&V Report #4
- Project Technical Report and Presentation #4

Subtask 6.5 Future Project #1
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:
- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #1*.

Product:
- Documentation of Approval #1

Subtask 6.6 Future Project #2
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:
- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #2*.

Product:
- Documentation of Approval #2

Subtask 6.7 Future Project #3
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:
- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.

- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #3*.

Product:
- Documentation of Approval #3

Subtask 6.8 Future Project #4
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:
- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #4*.

Product:
- Documentation of Approval #4

Subtask 6.9 Future Project #5
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:
- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #5*.

Product:
- Documentation of Approval #5

Subtask 6.10 Future Project #6

The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:

- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #6.*

Product:

- Documentation of Approval #6

Subtask 6.11 Future Project #7
The goal of this task will be determined based on the process of determining future year projects as described in Task 2.

The Recipient shall:

- Identify and recommend a demonstration project to the CAM, based on the process as described in Task 2.
- Submit a CEQA Worksheet for the proposed demonstration, explaining its potential environmental effects, if any, and respond to any questions from CEC staff regarding potential environmental effects.
- If the demonstration project is determined to be necessary or required by the CEC (i.e., subject to CAM approval), Recipient shall prepare draft subtask language for the Scope or Work, for consideration by the CAM, to replace this SOW subsection's language.
- Subsequent to the required CEC approval process and amendment of the Scope of Work, the Recipient shall provide *Documentation of Approval #7*.

Product:

- Documentation of Approval #7

While there are currently 7 future demonstration projects outlined in this scope, this is simply an estimate. There may be more or less at the discretion of the Hub administrator and dependent on CAM approval.

NOTE ON RETENTION AS RELATED TO DEMONSTRATION PROJECTS
Under Exhibit C, section 8, Payment of Funds, subsection (m) (". . . Retention may be released upon completion of tasks that are considered separate and distinct . . ."), the CAM may release retention earlier than the end of the grant project, as follows:

At the CAM's discretion, a certain percentage of the grant agreement budget retention may be released upon receipt of each demonstration project's "Project Technical Report and

Presentation" outlined in Task 6 of the Scope of Work, which the Recipient (and respective Subrecipient) will deliver once the demonstration project's entire scope of work has been completed. This deliverable is intended to be included as a chapter in the final report; thus, each such report is subject to approval by the Prime Recipient and the CAM prior to acceptance by the CAM. Upon approval by the CAM of each demonstration project's "Project Technical Report and Presentation" deliverable, at the CAM's sole discretion, the CAM may decrease the final retention percentage by one (1) percentage point (e.g., after the first Project Technical Report and Presentation is received and approved, the total retention held until the end of the project term may drop down to 9%, and so on), but not below a floor of three percent (3%) of the retention.

Because the total number of demonstration projects is yet to be determined, the number of possible "Project Technical Report and Presentation" deliverables is also uncertain. To this end, the CAM may allow for one (1) percentage point of the retention decreased for a "Project Technical Report and Presentation" deliverable received, until the total percentage of retention reaches three percent (3%), which is the floor. At that point, no further retention will be released, until the end of the project term, and dependent on the receipt of all agreement deliverables to the satisfaction of the CAM, and released at the discretion of the CAM.

TASK 7 EVALUATION OF PROJECT BENEFITS
The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

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

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)

- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

TASK 8 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES
The goal of this task is to conduct activities that will accelerate the commercial adoption of a portfolio of demand flexibility enabling technologies being supported under this agreement.

The Recipient Shall:

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

Products:

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

Subtask 8.1 Website Design, Development, Maintenance, and Implementation
The goal of this subtask is to design, develop, and implement a robust, user-friendly website.

The Recipient Shall:

- Design a robust, user-friendly *Project Website* that will include, but not be limited to:
  - A description of the Hub structure, mission, and vision.
  - Information about the project team, roles, and responsibilities.

  - Information about the stakeholder groups, objectives, meeting schedule, and information from past meetings.
  - A mailing list to receive updates and notifications.
  - A central repository for relevant demand flexibility publications and data.
- Regularly update, maintain, protect, and ensure the security of the entire website.

Products:
- Project Website

Subtask 8.2 Stakeholder Engagement
The goal of this subtask is to effectively coordinate and engage a diverse group of stakeholders to ensure user-inspired research, dynamically manage research projects, and inform new policies and stakeholder needs.

The Recipient Shall:
- Develop a *Project 1-4 Tech Transfer Case Study* for each demonstration project that includes but is not limited to:
  - Details on elements of the projects that are replicable across facilities, industries, and industry types among other factors.
  - Details on elements of the projects that are commercially available for immediate use by market participants.
  - Details on special considerations, if any, for technology implementors to consider when conducting similar projects.
- Convene an LSE Stakeholder Group through an opt-in mechanism that offers open participation of relevant stakeholders including but not limited to IOUs, community choice aggregators, publicly owned utilities, municipal utilities districts, and electric service providers.
  - Establish and document the *LSE Stakeholder Group Objectives and Mechanisms Memo* that describes the stakeholder group's objectives and appropriate mechanisms to meet them.
  - Develop and submit an *LSE Stakeholder Group Target Members List*. Recruit prospective members and publish the list of members via the Hub website.
  - Establish an *LSE Stakeholder Group Meeting Schedule* with a cadence in line with the objectives and mechanisms previously determined, no less than quarterly.
  - Develop and submit for a *Year 1 – 6 LSE Stakeholder Group Meeting Agenda(s)* two weeks prior to the scheduled meeting.
  - Synthesize discussions and submit for each year a *Year 1 – 6 LSE Stakeholder Group Meeting Summary with Findings, and Collateral Memo* within two weeks following the meeting.
- Convene an Industry Stakeholder Group through an opt-in mechanism that offers open participation of relevant stakeholders including but not limited to industry participants that may adopt demand flexibility technologies.
  - Establish and document the *Industry Stakeholder Group Objectives and Mechanisms Memo* that describes the stakeholder group's objectives and appropriate mechanisms to meet them.
  - Develop and submit an *Industry Stakeholder Group Target Members List*. Recruit prospective members and publish the list of members via the Hub website.
  - Establish an *Industry Stakeholder Group Meeting Schedule* with a cadence in line with the objectives and mechanisms previously determined, no less than quarterly.

  - Develop and submit the *Year 1 – Year 6 Industry Stakeholder Group Meeting Agendas* two weeks prior to the scheduled meeting.
  - Synthesize discussions and submit *Year 1 – Year 6 Industry Stakeholder Group Meeting Summary with Findings, and Collateral Memo* within two weeks following the meeting.
- Convene a Technology and Implementers (T&I) Stakeholder Group through an opt-in mechanism that offers open participation of relevant stakeholders including but not limited to technology vendors, load management and VPP program implementors, and accelerators and incubators focused on demand flexibility.
  - Establish and document the *T&I Stakeholder Group Objectives and Mechanisms Memo* that describes the stakeholder group's objectives and appropriate mechanisms to meet them.
  - Develop and submit a *T&I Stakeholder Group Target Members List*. Recruit prospective members and publish the list of members via the Hub website.
  - Establish a *T&I Stakeholder Group Meeting Schedule* with a cadence in line with the objectives and mechanisms previously determined, no less than quarterly.
  - Develop and submit the *Year 1 – Year 6 T&I Stakeholder Group Meeting Agenda(s)* two weeks prior to the scheduled meeting.
  - Synthesize discussions and submit *Year 1 – Year 6 T&I Stakeholder Group Meeting Summary with Findings, and Collateral Memo* within two weeks following the meeting.
- Provide feedback on future research recommendations (see details in Task 2).
- Provide feedback on MIDAS as a price server to enhance the API as a platform based on demonstration projects and other use cases that stakeholders are familiar with.

Products:

- Project 1 – 4 Tech Transfer Case Studies (4)
- LSE Stakeholder Group Objectives and Mechanisms Memo
- LSE Stakeholder Group Target Members List
- LSE Stakeholder Group Meeting Schedule
- Year 1 – Year 6 LSE Stakeholder Group Meeting Agendas (Quarterly)
- Year 1 – Year 6 LSE Stakeholder Group Meeting Summary with Findings, and Collateral Memos (Quarterly)
- Industry Stakeholder Group Objectives and Mechanisms Memo
- Industry Stakeholder Group Target Members List
- Industry Stakeholder Group Meeting Schedule
- Year 1 – Year 6 Industry Stakeholder Group Meeting Agendas (Quarterly)
- Year 1 – Year 6 Industry Stakeholder Group Meeting Summary with Findings, and Collateral Memos (Quarterly)
- T&I Stakeholder Group Objectives and Mechanisms Memo
- T&I Stakeholder Group Target Members List
- T&I Stakeholder Group Meeting Schedule
- Year 1 – Year 6 T&I Stakeholder Group Meeting Agendas (Quarterly)
- Year 1 – Year 6 T&I Stakeholder Group Meeting Summary with Findings, and Collateral Memos (Quarterly)

Subtask 8.3 Annual Events and Convenings

EXHIBIT A
Scope of Work
Build Momentum

The goal of this subtask is to facilitate annual events to bring together stakeholders to learn about the work of the Hub, share information, and network.

The Recipient Shall:

- Identify a host site for each year's convening.
- Submit a Year 1 – Year 5 *Proposed Event Schedule* for each convening at least 1 month prior to the scheduled event.
- Confirm speakers and panel participants with site hosts.
- Publish Year 1 – Year 5 *Final Event Details* on the Hub's public website and disseminate through relevant channels.
- Recruit attendees.
- Host the event.
- Document the event and submit Year 1 – Year 5 *Event Photo and Video Content.*

Products:

- Year 1 – Year 5 Proposed Event Schedules (5)
- Year 1 – Year 5 Final Event Details Summaries (5)
- Year 1 – Year 5 Event Photo and Video Content (5)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.