STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 02/13) CALIFORNIA ENERGY COMMISSION

New Agreement EPC-14-044 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
ERDD	Prab Sethi	43	916-327-1302

Recipient's Legal Name	Federal ID Number
Lawrence Berkeley National Laboratory	94-2951741

Title of Project
Enabling Anaerobic Digestion Deployment for Municipal Solid Waste-to-Energy

Term and Amount	Start Date	End Date	Amount
	5/15/2015	3/30/2019	$ 4,300,000

Business Meeting Information

☐ ARFVTP agreements under $75K delegated to Executive Director.

Proposed Business Meeting Date	4/8/2015	☐ Consent	☒ Discussion
Business Meeting Presenter	Prab Sethi	Time Needed:	10 minutes

Please select one list serve. Select

Agenda Item Subject and Description

Proposed resolution approving Agreement EPC-14-044 with the Department of Energy's Lawrence Berkeley National Laboratory for a $4,300,000 grant to perform research to enable environmentally and economically sustainable deployment of technology that transforms organic municipal solid waste into heat, electricity, and compost via dry anaerobic digestion. (EPIC funding) Contact: Prab Sethi. (Staff presentation: 10 minutes)

California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
   ☒ Yes (skip to question 2) ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):
   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:
   ☒ a) Agreement **IS** exempt. (Attach draft NOE)
   ☐ Statutory Exemption. List PRC and/or CCR section number:
   ☒ Categorical Exemption. List CCR section number: 14 CCR 15306
   ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)
   Explain reason why Agreement is exempt under the above section:
   Class 6 - Basic data collection, research, experimental management, and resource evaluation activities that do not result in major disturbances to an environmental resource.
   ☐ b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)
   Check all that apply
   ☐ Initial Study ☐ Environmental Impact Report
   ☐ Negative Declaration ☐ Statement of Overriding Considerations
   ☐ Mitigated Negative Declaration

List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	Budget
Zero Waste Energy Development Company	$ 626,702
City of San jose, Integrated Waste Management Division	$ 117,402
	$

List all key partners: (attach additional sheets as necessary)

Legal Company Name:

Budget Information

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	13-14	301.001A	$4,300,000
			$
R&D Program Area: EGRO: Renewables		TOTAL:	$4,300,000
Explanation for "Other" selection			

STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 02/13) CALIFORNIA ENERGY COMMISSION

Reimbursement Contract #:	Federal Agreement #:

Recipient's Administrator/ Officer				**Recipient's Project Manager**			
Name:	Betsy Quayle			Name:	Thomas Kirchstetter		
Address:	1 CYCLOTRON RD			Address:	1 CYCLOTRON RD		
City, State, Zip:	BERKELEY, CA 94720-8099			City, State, Zip:	BERKELEY, CA 94720-8099		
Phone:	510 4867391 /	Fax:	- -	Phone:	510-486-7071 /	Fax:	- -
E-Mail:	BEQuayle@lbl.gov			E-Mail:	twkirchstetter@lbl.gov		

Selection Process Used

☒ Competitive Solicitation Solicitation #: PON-14-305

☐ First Come First Served Solicitation

The following items should be attached to this GRF		
1. Exhibit A, Scope of Work		☒ Attached
2. Exhibit B, Budget Detail		☒ Attached
3. CEC 105, Questionnaire for Identifying Conflicts		☒ Attached
4. Recipient Resolution	☒ N/A	☐ Attached
5. CEQA Documentation	☐ N/A	☒ Attached

Agreement Manager	**Date**	**Office Manager**	**Date**	**Deputy Director**	**Date**

Exhibit A
Scope of Work

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Air Emissions Measurement, Modeling, and Approaches for Minimizing Odors
3	X	Life-cycle Cost, Energy, and Greenhouse Gas Assessment to Maximize Economic and Environmental Performance
4		Policy and Economic Barrier Assessment to Enable Additional Net Energy Export
5	X	Implementation in Scale Up of Waste Intake and Power Production
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities
8		Production Readiness Plan

B. Acronym/Term List

Acronym/Term	Meaning
CO_2	Carbon Dioxide
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CH_4	Methane
CHP	Combined Heat and Power
CPR	Critical Project Review
DG	Distributed Generation
EPIC	Electric Program Investment Charge
GW	Gigawatts
GWh	Gigawatt-Hours
GHG	Greenhouse Gas
IOU	Investor-Owned Utility
LCOE	Levelized Cost of Electricity
MW	Megawatts
MSW	Municipal Solid Waste
N_2O	Nitrous Oxide
PG&E	Pacific Gas and Electric
RPS	Renewable Portfolio Standard
TAC	Technical Advisory Committee
ZWEDC	Zero Waste Energy Development Company

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

Exhibit A
Scope of Work

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

A. Purpose of Agreement

The purpose of this Agreement is to fund research to enable environmentally and economically sustainable deployment of technology that transforms organic municipal solid waste into heat, electricity, and compost via dry anaerobic digestion. A dry anaerobic digestion and composting facility processing the organic fraction of MSW will be scaled up from 40,000 tons/year to 90,000 tons/year in Phase 1 and to 180,000 tons/year in Phase 2, resulting in an increased production of renewable electricity and heat.

B. Problem/ Solution Statement

Problem

Production of energy from waste biomass aligns with California's clean energy policies and diverts waste from landfills, reduces landfill methane and fossil carbon dioxide (CO_2) emissions, reduces fossil fuel reliance, and improves grid reliability and resiliency. Using the organic fraction of California's municipal solid waste (MSW) for combined heat and power (CHP) generation has the potential to produce about 5 terawatt-hours (TWh) of renewable electricity per year, as well as about 509 million therms of renewable heat energy per year. This would help the state meet its Renewable Portfolio Standard (RPS), diversify the mix of resources in the state's electric generation portfolio, and help municipal governments achieve sustainability goals. Despite its impressive potential, only about 15 percent of California's organic waste is diverted for energy production, and this fraction is decreasing due to regulatory and permitting challenges, air quality concerns, high capital costs, long waiting periods for interconnection, and uncertainties associated with compensation for power output and co-products. These challenges may result in an unsuitable business case. Solutions require multidisciplinary approaches that few institutions and partnerships are able to tackle.

Zero Waste Energy Development Company (ZWEDC) developed and owns a facility that marries dry anaerobic digestion and composting to process the organic fraction of MSW. Although its initially limited scale only allows it to process a fraction of San José's organic MSW, it is currently the largest dry anaerobic digestion facility in the world. It opened for business in San José, California, in late 2013, and in its current initial development phase processes 40,000 tons/year, yielding approximately 400 million cubic feet per hour (m^3/hour) of biogas with a methane content of 53 percent. The biogas feeds a CHP unit producing heat for the digesters and electricity, approximately 20 percent of which is used to operate all aspects of the facility. Further deployment of its waste processing technology would allow ZWEDC to sustainably scale-up operations from current levels to 90,000 tons/year of municipal waste within the next three years to complete Phase 1 of development. Phase 2 scale-up to 180,000 tons/year is planned by 2019.

The added capacity will help the city of San José meet its goal of 100 percent diversion of landfill waste and has the potential to increase ZWEDC's annual renewable energy production by a factor of six, to 31.5 gigawatt-hours (GWh) and 3.2 million therms of electricity and heat, respectively. However, because such a facility has never been deployed at a commercial scale, ZWEDC must overcome a new set of challenges. Scale-up is impeded by (1) odor problems and associated public adversity, (2) policy and economic barriers to maximizing net energy export, and (3) incomplete life-cycle cost and environmental evaluations to support decision-making for export of co-products, which include waste heat, gas, fertilizer, and compost.

Solution

The Lawrence Berkeley National Laboratory, ZWEDC, and the City of San Jose will work together to enable the sustainable commercial deployment of ZWEDC's waste digestion, CHP, and composting capacity. The multidisciplinary team composed of research scientists and experts in waste management, bioenergy production, and public policy will (1) devise and validate approaches to measure and minimize emissions of air pollutants and GHGs, and model fate and transport of odorants; (2) identify opportunities for improved economic and environmental performance by quantifying the life-cycle cost, energy, and GHG impacts; and (3) identify policy and economic barriers and solutions to maximize ZWEDC's net energy export. Knowledge gained and lessons learned will be shared with other cities in California.

These activities will be conducted for the current base case and during scale-up to identify strengths, limitations, and possible modifications for process improvements. We will develop a roadmap for maximally efficient and cost-effective utilization of waste bioenergy (urban, commercial, and residential organic wastes). The project will provide a new and compelling analytical framework that commercial biogas/bioenergy stakeholders can use to scale up operations and overcome deployment challenges through demonstration and evaluation at key junctures. Since there are common barriers and enhancement opportunities for other facilities, our solutions will have broader applicability for making various processes at other facilities more economically attractive and environmentally benign.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to enable the ZWEDC organic waste processing and CHP facility to achieve commercial-scale operations by the end of the project by overcoming the key barriers associated with anaerobic digestion, composting, and power production. This will maximize the facility's net life-cycle energy and GHG benefits to California. The project goal will be achieved by:

- Minimizing odor and related air quality impacts of scaling up ZWEDC's waste processing capacity.
- Identifying and evaluating competing technologies (e.g., wet vs. dry anaerobic digesters) for scale-up on the basis of cost and environmental impacts.
- Identifying optimal power and co-product (biogas, heat, fertilizer, compost) utilization and export options by characterizing economic and environmental trade-offs.
- Identifying economic and policy barriers to maximize production and utilization of electricity and co-products from ZWEDC's waste-to-energy facility.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity reliability and lower costs by scaling up diversion of organic waste for distributed generation (DG) of CHP and compost production. The benefits to investor-owned utility (IOU) ratepayers of ZWEDC's expansion stem from three key facts: (1) by utilizing organic waste instead of fossil fuel, the facility helps insulate ratepayers from fluctuations and long-term increases in fossil fuel prices; (2) utilizing waste heat reduces costs and increases safety by improving the overall efficiency of the facility, thus avoiding additional fossil fuel demand and environmental impacts; (3) serving as distributed generation and providing electricity to neighboring critical infrastructure (a recycling and materials recovery facility) helps reduce transmission and distribution costs and improve grid reliability.

[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).

It also contributes to California's efforts to mitigate the effects of climate change by reducing net GHG emissions.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by scaling up operations at ZWEDC's organic waste anaerobic digestion, composting, and CHP facility. This project builds on the early success of ZWEDC by developing strategies to overcome technical, policy, and market barriers to scale-up. Because the ZWEDC facility is the first large-scale dry anaerobic digester in the United States, guidance for overcoming technical, economic, and environmental hurdles to scale-up is essential. By conducting research to reduce odor and air quality impacts, improve the ZWEDC facility's life-cycle energy and GHG footprint, reduce life-cycle costs, and maximize co-product utilization, valuable information will be provided to existing or planned biogas facilities throughout California. Specific benefits of this project include: diversion of waste from the City of San José, increased production of compost for use as a fertilizer amendment, reduced negative externalities from the ZWEDC facility such as odor, and redevelopment of a former landfill site. Utilizing the organic fraction of MSW for heat and power production helps California reach a number of statewide goals, including Governor Brown's Clean Energy Jobs Plan, which requires 12 gigawatts (GW) of distributed generation and 6.5 GW of CHP by 2020; the statewide RPS; Assembly Bill 341, which requires 75 percent diversion of solid waste from landfills by 2020; and Senate Bill 112, which requires IOUs to produce at least 250 megawatts (MW) from small-scale bioenergy facilities.

Agreement Objectives

The objectives of this Agreement are to:

- Characterize and quantify key odor-causing emissions and governing conditions; determine odor dispersion patterns and source-receptor relationship; and recommend best feasible odor control strategies.
- Determine net changes in life-cycle (direct and indirect) GHG emissions of CO_2, methane (CH_4), and nitrous oxide (N_2O).
- Identify economic and policy factors affecting ZWEDC's ability to export power.
- Provide recommendations that will enable production and utilization of additional electricity.
- Develop strategies for overcoming technical hurdles to scale-up, including those associated with digester technology choice, biogas quality, CHP system operation, waste heat utilization, and air quality.
- Determine on-site demand and opportunities for export of co-products, including biogas, waste heat, fertilizer, and compost.
- Sustainably scale-up ZWEDC operations from current levels to 90,000 tons/year of municipal waste within the next three years to complete Phase 1 of development. Phase 2 scale-up to 180,000 tons/year is planned by 2019. Such scale-up has the potential to increase ZWEDC's annual renewable energy production by a factor of six, to 31.5 gigawatt-hours (GWh) and 3.2 million therms of electricity and heat, respectively.

[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.

Exhibit A
Scope of Work

II. 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).** 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

- 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.
- Submit the final product to the CAM once agreement has been reached on the draft. The CAM will provide written approval of the final product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- If the CAM determines that the final product does not sufficiently incorporate his/her comments, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

For products that require a final version only

- Submit the product to the CAM for approval.
- If the CAM determines that the product requires revision, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

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 Energy Commission's 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 or CD-ROM.

      The following describes the accepted formats for electronic data and documents provided to the Energy Commission 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.
- Documents intended for public distribution will be in PDF file format. The Recipient must also provide the native Microsoft file format.
- 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 Energy Commission'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, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to 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., WebEx), with approval of the CAM.

  The administrative portion of the meeting will include discussion of the following:
  - Terms and conditions of the Agreement;
  - Administrative products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Match fund documentation (subtask 1.7);
  - Permit documentation (subtask 1.8);

- Subcontracts (subtask 1.9); and any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
- An updated Project Schedule;
- Technical products (subtask 1.1);
- Progress reports and invoices (subtask 1.5);
- Final Report (subtask 1.6);
- Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
- Any other relevant topics.

- Provide an *Updated Project Schedule, List of Match Funds,* and *List of Permits*, 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:

- Updated Project Schedule *(if applicable)*
- Updated List of Match Funds *(if applicable)*
- Updated List of Permits *(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 Energy Commission 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 Energy Commission 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 Energy Commission.

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 will 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 Energy Commission, 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 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.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).

- 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* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will 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. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- 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)
- Task Products (draft and/or final as specified in the task)

CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- 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 Energy Commission 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 and the CAO of the following Agreement closeout items:

- Disposition of any state-owned equipment.
- Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
- The Energy Commission'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 *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

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

REPORTS AND INVOICES

Subtask 1.5 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 all Agreement activities conducted by the Recipient for the preceding month, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
  - Provide a synopsis of the project progress, including accomplishments, problems, milestones, products, schedule, fiscal status, and any evidence of progress such as photographs.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions. In addition, each invoice must document and verify:
  - Energy Commission funds received by California-based entities;
  - Energy Commission funds spent in California *(if applicable)*; and
  - Match fund expenditures.

Products:
- Progress Reports
- Invoices

Subtask 1.6 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. The CAM will review and approve the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use a Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:
- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM.
- Submit a draft of the outline to the CAM for review and comment.
- Once agreement has been reached on the draft, submit the final outline to the CAM. The CAM will provide written approval of the final outline within 10 days of receipt.

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

CAM Product:
- Style Manual
- Comments on Draft Final Report Outline
- Approval of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:
- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline and the Style Manual provided by the CAM.
- Submit a draft of the report to the CAM for review and comment. Once agreement on the draft report has been reached, the CAM will forward the electronic version for Energy Commission internal approval. Once the CAM receives approval, he/she will provide written approval to the Recipient.
- Submit one bound copy of the Final Report to the CAM.

Products:
- Final Report (draft and final)

CAM Products:
- Comments on Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 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. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

Exhibit A
Scope of Work

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 proposal that led to the Energy Commission 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 proposal that led to the Energy Commission 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.
  - A copy of 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 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
  - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
  - The schedule the Recipient will follow in applying for and obtaining the permits.

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed.
The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits *(if applicable)*
- Updated Schedule for Acquiring Permits *(if applicable)*
- Copy of each Approved Permit *(if applicable)*

Subtask 1.9 Subcontracts
The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts *(draft if required by the CAM)*

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 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.

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 1.11.
- 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 1.11 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.

Products:

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

III. TECHNICAL TASKS

TASK 2: Air Emissions Measurement, Modeling, and Approaches for Minimizing Odors

The goal of this task is to measure emissions of odorous air pollutants and GHGs from the ZWEDC facility, model the fate and transport of odorants, and devise and validate approaches to minimize air quality impacts of scaling up of waste processing and power generation. These efforts also will support GHG life-cycle assessments (see Task 3). Tasks will be performed to characterize the conditions governing the emissions from the ZWEDC facility, determine odor dispersion patterns and source-receptor relationships, and recommend best feasible odor control strategies.

The Recipient shall:

- Critically review prior assessments and complaints of odor at this and other facilities that use anaerobic digestion and composting to process the organic fraction of MSW. Facility-wide assessment will be conducted with focus on odor-generating conditions such as:
    - Waste source location and content (e.g., food versus yard waste composition), season of year, and possibly other factors such as material moisture content and pH.
    - Age of various constituents of waste stream prior to digestion.
- Measure fluxes of key odor-causing species and GHGs and scale to future operational levels to account for potential impacts. Measure emissions as a function of process time and history and at several facility locations:
    - Measure odor species including hydrogen sulfide, carbon disulfide, ammonia, low molecular weight amines, formaldehyde, acetaldehyde, and volatile organic compounds.
    - Measure GHGs including N_2O, CH_4, and CO_2.
    - Measure emissions inside the facility, anaerobic digester, and in-vessel composting; over the biofilter that treats all the indoor facility air and the outdoor composting windrows; and in the exhaust of the CHP units.
    - Direct the focus of added odor control to specific time intervals of the waste transformation process, in response to time-resolved measurements, which may reveal that emission of odorous compounds is episodic rather than continuous.

    - Measure process air flows to convert measured species concentrations to fluxes: the biofilter exhaust flow rate, the CHP exhaust flow rate, and the outdoor composting windrows forced aeration rate.
- Analyze local meteorology using data from the National Weather Service and the twelve weather stations near San José. Establish average and seasonal patterns in local circulation using multi-year data.
- Perform dispersion modeling to determine temporal and spatial characteristics of odor dispersion, accounting for chemical specific odor thresholds and atmospheric transformations, and identify the most impacted receptor locations at current and future operation scales of the ZWEDC facility.
    - Work with neighbor stakeholders to validate the affected times and locations and identify additional events (e.g., upsets on holiday weekends) and locations that they find most offensive.
- Reconcile odor measurements and source-receptor relationship with the odor-generating conditions (e.g. sources and types by location and season, moisture content, age) and devise measures to reduce odorous emissions at the most influential locations and times. Potential control options may include the following:
    - Increasing in-vessel composting pretreatment duration to reduce odors from outdoor composting windrows.
    - Modifying forced aeration of outdoor composting windrows.
    - Increasing air residence time in biofilters to further remove odorous compounds from air vented from the indoor facility.
    - Changing surface-to-volume ratio of wood chips in biofilters to improve removal efficiency.
    - Modifying waste mix processed in digesters (e.g., relative amounts of yard waste versus food waste).
- Evaluate and validate efficacies of odor control strategies with measurements, dispersion modeling, and local community outreach at the stages of scale-up in Task 5.
- Prepare an *Air Emissions Measurement, Modeling, and Approaches for Minimizing Odors Report* summarizing activities in this task, including, but not limited to:
    - Characterization of odor emissions and greenhouse gases from an anaerobic digestion and composting facility
    - Odor dispersion and odor reduction management

Products:

- Air Emissions Measurement, Modeling, and Approaches for Minimizing Odors Report (draft and final)

TASK 3: Life-Cycle Cost, Energy, and Greenhouse Gas Assessment to Maximize Economic and Environmental Performance

The goal of this task is to identify opportunities for improved economic and environmental performance by quantifying the life-cycle cost, energy demand, and net GHG impacts of the existing ZWEDC facility and for paths to scale-up.

The Recipient shall:

- Construct a detailed process model to track energy and mass flows as well as cost for the ZWEDC facility.
- Construct a logistics model to characterize the transportation and storage of waste input, compost, and other material inputs and products.

- Develop a set of likely scenarios for scaling up to 180,000 tons of waste processed per year that will:
    - Include variations on both dry and wet anaerobic digester technologies.
    - Incorporate options for sourcing, transporting, and storing organic solid waste, including additional commercial food waste, yard waste, and residential organic waste. Account for variations in moisture content, biomass loss during storage, transportation distances, and sorting/processing costs.
    - Provide co-product (gas, heat, fertilizer, and compost) export/utilization alternatives.
- Conduct a life-cycle cost, energy use, and GHG assessment of the ZWEDC facility's current operations (at 40,000 tons waste/year) and future operations at 100 percent of existing capacity (90,000 tons/year).
- Conduct a life-cycle cost, energy use, and GHG assessment of competing options for scale-up of the ZWEDC facility to 180,000 tons of waste/year based on the set of likely scenarios developed in the previous subtask.
- Identify cost and environmental trade-offs and opportunities for improvement:
    - Complete an uncertainty analysis for cost, energy use, and GHG results.
    - Identify opportunities for cost reduction and environmental performance improvement at current capacity.
    - Provide a summary of economic/environmental trade-offs associated with scale-up options available to ZWEDC.
- Prepare a *CPR Report* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.
- Prepare *Life-Cycle Cost, Energy, and Greenhouse Gas Assessment to Maximize Economic and Environmental Performance Report*, to include, but not be limited to:
    - Paths to Doubling Waste Processing and Electricity Generating Capacity
    - Life-cycle Cost and Environmental Assessment

Products:

- CPR Report
- Life-cycle Cost, Energy, and Greenhouse Gas Assessment to Maximize Economic and Environmental Performance Report (draft and final)

TASK 4: Policy and Economic Barrier Assessment to Enable Additional Net Energy Export

The goal of this task is to identify regulatory and economic barriers to ZWEDC's ability to export net electricity and provide recommendations that would enable production and utilization of additional electricity.

The Recipient shall:

- Identify potential economic barriers to ZWEDC's ability to export net energy to the Pacific Gas and Electric (PG&E) retail market. Identify potential alternative wholesale energy opportunities by analyzing wholesale (California Independent System Operator) electric tariffs and determine whether ZWEDC's distributed generation aligns with tariffs eligibility and performance requirements.
- Identify opportunities for ZWEDC to overcome barriers and work with local governments to accelerate the connection of CHP units based on alignment with the public interest.
- Quantify the business case alternatives for ZWEDC based on tariff analyses (e.g., PG&E versus wholesale) using hourly load profiles and examine options to maximize CHP system output.

- Expand analysis of financial incentives for CHP and other distributed generation to large cities in California, including Sacramento, San Francisco, San José, Los Angeles, San Diego, and Fresno.
- Prepare *Policy and Economic Barrier Assessment to Enable Additional Net Energy Export Report* that includes, but is not limited to:
    - Regulatory and economic barriers and opportunities to export net energy
    - Recommendations to enable production and utilization of additional electricity

Products:

- Policy and Economic Barrier Assessment to Enable Additional Net Energy Export Report (draft and final)

TASK 5: Implementation in Scale Up of Waste Intake and Power Production

The goal of this task is to implement the recommendations from Tasks 2-4 to increase organic waste intake for anaerobic digestion, compost output, and heat and power generation from current pilot operations to commercial scale at the ZWEDC facility in San Jose, California. The facility scale-up will be accomplished through a staged process in which waste intake and power generation are increased to reach the facility's current capacity of 90,000 tons of waste processed/year and at least 1.6 MW of power. Solving the technical and policy barriers discussed above will enable the second major development/deployment phase, which will subsequently double total capacity to 180,000 tons/year, with the potential to generate as much as 4 MW of power by the project's end date.

The Recipient shall:

- Provide operating data, guidance, and feedback on research conducted during Tasks 2-4, and assess the feasibility of implementing the recommendations for reducing scale-up costs, mitigating odor, reducing energy use and GHG emissions, and maximizing net energy exports
- Increase the facility's waste intake to 50,000 tons/year (end of year 1).
- Increase the facility's waste intake to 70,000 tons/year and achieve 1 MW of power generation (end of year 2).
- Complete Phase 1: Increase the facility's waste intake to 90,000 tons/year and reach 1.6 MW, and possibly up to 2.0 MW, of power generation (end of year 3).
- Determine the facility's maximum possible power output for Phase 2, based on results from Tasks 2 (odor management), 3 (life-cycle cost, energy, and GHG emissions), and 4 (electricity export strategies).
- Complete Phase 2: Increase the facility's waste intake capacity to 180,000 tons/year
    - Install 90,000 tons/year of additional anaerobic digestion capacity and corresponding composting capacity.
    - If possible, increase net CHP capacity up to a maximum total of 4 MW.
- Prepare *Implementation in Scale Up of Waste Intake and Power Production Report* that includes
    - Description of work and equipment for scale up of anaerobic digestion, CHP, composting facilities, and electricity export
    - *Appendix* that includes, but is not limited to:
        - Operational Data and Analysis: Annual updates of hourly operating data
        - Lessons learned

- Prepare a CPR Report in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Exhibit A
Scope of Work

Products:

- Implementation in Scale Up of Waste Intake and Power Production Report (draft and final)
- Appendix (draft and final)
- CPR Report

TASK 6: Evaluation of Project Benefits

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

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*. Update *Attachment 12 Cost and Benefit Calculations and Small-Scale Bioenergy LCOE calculator.* If not using LCOE calculator, clearly explain why not applicable, provide other cost measures and justify the measures.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

    - For Product Development Projects and Project Demonstrations:
        - Published documents, including date, title, and periodical name.
        - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
        - Greenhouse gas and criteria emissions reductions.
        - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
        - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
        - A discussion of project product downloads from websites, and publications in technical journals.
        - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
        - Additional Information for Product Development Projects:
            - Outcome of product development efforts, such copyrights and license agreements.
            - Units sold or projected to be sold in California and outside of California.
            - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
            - Investment dollars/follow-on private funding as a result of Energy Commission funding.
            - Patent numbers and applications, along with dates and brief descriptions.
        - Additional Information for Product Demonstrations:
            - Outcome of demonstrations and status of technology.
            - Number of similar installations.
            - Jobs created/retained as a result of the Agreement.

- For Information/Tools and Other Research Studies:
  - Outcome of project.
  - Published documents, including date, title, and periodical name.
  - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
  - The number of website downloads.
  - An estimate of how the project information has affected energy use and cost, or has resulted in other non-energy benefits.
  - An estimate of energy and non-energy benefits.
  - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
  - A discussion of project product downloads from websites, and publications in technical journals.
  - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire, with Attachment 12 Cost and Benefits Calculations, LCOE calculator or other, as applicable.
- Mid-term Benefits Questionnaire, with Attachment 12 Cost and Benefits Calculations, LCOE calculator or other, as applicable.
- Final Meeting Benefits Questionnaire, with Attachment 12 Cost and Benefits Calculations, LCOE calculator or other, as applicable.

TASK 7: Technology/Knowledge Transfer Activities

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
  - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
  - A description of the intended use(s) for and users of the project results.
  - Published documents, including date, title, and periodical name.
  - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.

- A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
- The number of website downloads or public requests for project results.
- Additional areas as determined by the CAM.

- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop on the results of the project.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Presentation Materials (draft and final)
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

TASK 8: Production Readiness Plan

The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project's results.

The Recipient shall:

- Prepare a *Production Readiness Plan*. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
  - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
  - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes."
  - The estimated cost of production.
  - The expected investment threshold needed to launch the commercial product.
  - An implementation plan to ramp up to full production.
  - The outcome of product development efforts, such as copyrights and license agreements.
  - Patent numbers and applications, along with dates and brief descriptions.
  - Other areas as determined by the CAM.

Products:

- Production Readiness Plan (draft and final)

IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 15-0408

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: LAWRENCE BERKELEY NATIONAL LABORATORY

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

RESOLVED, that the Energy Commission approves Agreement EPC-14-044 from PON-14-305 with the **Department of Energy's Lawrence Berkeley National Laboratory** for a **$4,300,000** grant to perform research to enable environmentally and economically sustainable deployment of technology that transforms organic municipal solid waste into heat, electricity, and compost via dry anaerobic digestion; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

CERTIFICATION

The undersigned Secretariat to the Commission 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 California Energy Commission held on April 8, 2015.

AYE: [List of Commissioners]
NAY: [List of Commissioners]
ABSENT: [List of Commissioners]
ABSTAIN: [List of Commissioners]

Harriet Kallemeyn,
Secretariat