

GRANT REQUEST FORM (GRF)New Agreement EPC-14-029 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
ERDD	Gina Barkalow	43	916-327-1446

Recipient's Legal Name	Federal ID Number
ABEC #2 LLC, dba West Star North Dairy Biogas	32-0357912

Title of Project
The West Star North Dairy Biogas-to -Electricity Project

Term and Amount	Start Date	End Date	Amount
	5/15/2015	3/31/2019	\$ 4,000,000

Business Meeting Information
 ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	3/11/2015	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Gina Barkalow	Time Needed:	10 minutes

Please select one list serve. Select

Agenda Item Subject and Description

Proposed resolution approving Agreement #EPC-14-029 with ABEC #2 LLC, dba West Star North Dairy Biogas for a \$4,000,000 grant to install and demonstrate an innovative, double-cell covered lagoon digester and 1-megawatt (MW) generation system to convert dairy manure into biogas and store the biogas above the primary and secondary lagoons under an inflatable cover, where it will be ready for conversion into renewable electricity for sale and export to the Pacific Gas & Electric (PG&E) distribution grid. (EPIC funding) Contact: Gina Barkalow

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 15301 "Existing Facilities"
 14 CCR 15303 "New Construction or Conversion of Small Structures"
 Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section:
 The activities funded under this agreement will occur at an existing dairy facility and include modifying the existing liquid manure handling system to install a double-cell covered lagoon with inflatable cover. There will also be installation of two new biogas-fueled internal combustion engines that will take up a small portion of the existing facility. This project will not have a significant effect on the environment because the covered lagoon will improve dairy operations and the environmental results thereof, and enable biogas conversion into renewable electricity.
- 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)

GRANT REQUEST FORM (GRF)

Legal Company Name:	Budget
California Bioenergy, LLC	\$ 312,156
Western Water Constructors, Inc	\$ 3,684,440
The Grant Farm	\$ 0
Quinn	\$ 0
Orrick, Herrington & Sutcliffe LLP (ORRICK)	\$ 0
Catepillar Financial Services Corporation (CFSC)	\$ 0
California State Treasurer	\$ 0
	\$
	\$

Exhibit A Scope of Work

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Pre-Development Activities
3	X	Project Construction & Operations
4		Evaluation of Project Benefits
5		Technology/Knowledge Transfer Activities
6		Production Readiness Plan

B. Acronym/Term List

Acronym/Term	Meaning
AB	Assembly Bill
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
CPUC	California Public Utilities Commission
IOU	Investor Owned Utility
kWh	Kilowatt hour
LCOE	Levelized Cost of Electricity
MW	Megawatt
PG&E	Pacific Gas and Electric Company
PPA	Power Purchase Agreement
SB	Senate Bill
scf(m)	Standard cubic feet (per minute)
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the demonstration of a pre-commercial Covered Lagoon Digester that will convert dairy manure into biogas; store it above the system's Primary and Secondary Lagoons under an inflatable cover; and convert it into electricity for export to the Pacific Gas & Electric (PG&E) distribution grid through the Senate Bill (SB) 1122 Bioenergy Feed-in Tariff. Balancing economic stability with financial upside, the project will lay the groundwork for a planned expansion that will enable the dairy biogas facility to seek participation in the Assembly Bill (AB) 2514 energy storage program.

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

B. Problem/ Solution Statement

Problem

In 2010, California passed AB 2514 to address emerging grid problems resulting from the state's success in the development and deployment of renewable energy, particularly of intermittent renewables such as solar and wind. Foremost among these problems is the 'gap' in electrical supply that is predicted to occur when solar generation stops at sunset and the wind is absent or insufficient to rotate turbines. Biogas energy storage systems have the potential to mitigate some of the challenges posed by this intermittency 'gap' by absorbing the energy contained in dairy manure through anaerobic digestion, storing the resultant biogas for a period of time, and then converting it into electricity and dispatching it on demand per investor owned utility (IOU) instruction instead of only upon production. Viewed purely in terms of cost per unit of production capacity, biogas electricity generation systems are more expensive than comparably sized solar power systems. However, when the cost of energy storage is factored into the equation, a storage-equipped biogas generation facility costs significantly less than a comparably sized solar system with storage. Many factors still conspire to hinder the financing, development, demonstration, and deployment of pre-commercial dairy-based power systems. Chief among these factors are the economics at this early stage of the industry and the lack of required expertise in electricity generation and storage among farmers.

Solution

Recipient will build and demonstrate a double-cell Covered Lagoon Digester and 1-megawatt (MW) generation system. When fully operational, this pre-commercial system will convert dairy manure into biogas and store the biogas above the Primary and Secondary Lagoons under an inflatable cover, where it will be ready for conversion into renewable electricity for sale and export to the PG&E distribution grid through the SB 1122 Bioenergy Feed-in Tariff and, in a planned 2016 expansion, through the AB 2514 electricity storage program.

The generation system will address the problems contributing to the lack of success of dairy digesters in California. First, the project will require minimal environmental review, with a strong likelihood that it will receive a categorical exemption under CEQA. Second, the phase-1 system will be eligible to sell electricity under an SB 1122 Power Purchase Agreement (PPA) and, in phase 2, under the AB 2514 electricity storage program. To maximize the project's ability to compete in the upcoming AB 2514 energy storage solicitation, the generation system will include the following components in the phase-1 system: 1) an approximate 3-day biogas storage capacity to enable contracted, on-demand electricity delivery to the IOU; 2) installation of 12kV electrical infrastructure to support up to 3 MW of phase-1 and incremental phase-2 generation capacity; 3) a modular design with layout and pad space built to receive additional generation capacity for storage as well as for co-digestion; and 4) development of control systems that will enable the phase-2 system, upon installation of a dedicated 1 MW storage engine, to dispatch electricity per IOU instruction. This approach to shaping the delivery of electricity based on IOU demand is anticipated to be less expensive than alternative storage approaches, thus allowing dairy bio-power projects to receive compensation based on this dispatch value, while saving ratepayers money. This is the first known solution that monetizes this ability of dairy bio-power generation systems to dispatch electricity generation at the request of the utility. In addition, a) the dairies plan to pool their individual interests in a cooperative structure; and b) the project will make significant improvements to digester design prior to the award that will decrease dairy and

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digester operating costs—and therefore the cost of electricity—while enhancing groundwater protection and preparing for co-digestion.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- build and operate for 12 months an innovative pre-commercial, storage-ready Covered Lagoon Digester and electricity generation system
- demonstrate innovative strategies for advancing the economic viability and stability of dairy-based biogas generation systems
- facilitate the storage of energy for electricity generation, based on the California Public Utilities Commission's (CPUC's) recent decision on AB 2514, to enable utility dispatch and additional revenues
- improve dairy operations and reduce dairy costs by advancing lagoon digester design
- use the same design innovations to make the first commercial-scale lagoon digester that is ready for co-digestion substrates
- enhance the interest among California dairies in on-farm biogas electric power systems through the success of the project
- demonstrate an innovative new ownership model for dairy biogas systems by coupling a partnership with a professional developer with a co-op approach to the dairy's share of profits
- appraise the operational and performance characteristics of the system.

Ratepayer Benefits:² This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety. Greater electricity reliability will come through the phase-1 system's capability to provide a steady, predictable supply of base load renewable electricity that is not subject to the intermittency "gap" associated with wind- and solar-generated electricity. In addition, phase-1 work will prepare the system for participation in the AB 2514 Storage solicitation in phase 2. Successful delivery of electricity at the dispatch of the utility, in phase 2, will significantly expand upon this value to the grid and thereby the ratepayer. The improved system design will also decrease dairy and digester operating costs—and therefore the cost of electricity—by impacting the economics shared with the dairy partner — while also protecting groundwater. A dairy biogas generator eliminates methane emissions and, as a result, reduces greenhouse gas emissions at a level substantially greater than other renewables as well as other bioenergy sources.

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 covering the lagoons and adding other critical

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

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

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improvements, thereby virtually eliminating methane emissions. In the process of preparing for co-digestion, the project's chosen design also enhances groundwater protection by replacing earthen ponds and lagoons with double-lined lagoons.

The pre-commercial phase-1 project will advance the design of covered lagoon digesters in several significant ways: 1) future-proofing the facility against future Central Valley Regional Water Board regulations; 2) possibly eliminating the need for a dedicated, 25-year-flood/120-day-flood storage pond; 3) becoming one of the first co-digestion-ready lagoon digesters in California; and 4) becoming the first dairy digester eligible to participate in the AB 2514 electricity storage solicitation (upon completion of phase 2 in 2016).

Agreement Objectives

The objectives of this Agreement are to:

- build a pre-commercial, storage-ready Covered Lagoon Digester
- operate the system for 12 months
- accept approximately 400 tons of excreted manure in a flush volume of 1 million gallons per day into the system
- produce approximately 280 scfm of biogas on a 24 x 7 basis or 150 million standard cubic feet (scf) of biogas per year of operation
- export at an annual rate of approximately 8.3 million kilowatt hour (kWh) of electricity to PG&E
- demonstrate that the enclosed area above the Primary Covered Lagoon Digester is capable of storing an approximately three-day supply of biogas in preparation for the planned phase-2 expansion
- measure the composition of the manure effluent including improvements in plant absorbable nitrogen to help the farmer benefit from the advancement
- share knowledge gained in this demonstration with dairy farmers and other biogas electricity project developers throughout California through webinars, signage, publications, and other outreach.

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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.

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- 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);

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- 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.

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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.

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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 monthly *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.

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- 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 Products:

- 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.

Recipient Products:

- Final Report (draft and final)

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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.

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*)

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- 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.

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- 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

Exhibit A Scope of Work

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

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III. TECHNICAL TASKS

*Products that require a draft version are indicated by marking “(draft and final)” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.*

TASK 2 PREDEVELOPMENT ACTIVITIES

The goal of this task is to complete a variety of predevelopment activities, including feedstock supply agreements, the PG&E interconnect agreement, the PG&E Power Purchase Agreement (PPA), equipment and materials procurement, and pre-certification of the project for the Renewable Portfolio Standard.

The Recipient shall:

- Prepare *Predevelopment Activities Plan* that includes, but is not limited to, timelines for finalizing:
 - Feedstock Agreement
 - PG&E Interconnection Agreement
 - PG&E PPA
- Execute *Predevelopment Activities Plan*
- Prepare *Construction and Equipment Lists* documenting the comprehensive construction costs. Based upon the completed design documents, the Construction and Equipment Lists will include all items to be purchased, constructed, or installed on the project. For each item, the letter shall provide:
 - The name of the item
 - The make, model, or other information as appropriate to the item
 - The name of the entity that will be carrying out the purchase and/or supply or installation of the item
 - The estimated or bid cost to purchase and install the item
- Develop proposed *Construction Timeline* running from the intended date to begin construction until the commercial operation date of the project
- Prepare Notification of Intention to purchase equipment using Energy Commission funds
- Use the Construction and Equipment Lists to procure all equipment and materials required to begin construction.
- Pre-certify the project for the Renewable Portfolio Standard.
- Prepare and conduct *Critical Project Review Presentation and Report*
- Complete Critical Project Review Meeting

Products:

- Predevelopment Activities Plan
- Construction and Equipment Lists
- Construction Timeline
- Notification of Intention to Purchase Equipment using Energy Commission funds
- Copy of Renewable Portfolio Standard Pre-certification Certificate
- Critical Project Review Presentation and Report #1 (draft and final)

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TASK 3 PROJECT CONSTRUCTION & OPERATIONS

The goals of this task are to prepare the project for pre-commercial operations and to operate it for 12 months.

Subtask 3.1 Project Construction

The Recipient shall:

- Execute construction of the project as outlined in the Construction Timeline and Construction and Equipment lists. This construction shall include the following major components:
 - Civil and Site Work
 - Covered Lagoon Digester System
 - Tier-1 Double-lined Lagoon Digester
 - Gas collection and air injection system
 - Flush box
 - Sand lane
 - Slope Screen Separator
 - Miscellaneous piping, wiring, and other equipment
 - Screw Press
 - Combined Heating and Power System
 - Heat recovery system
 - Cooling
 - Modular building
 - Control room with A/C and breaker panel
 - Radio equipment
 - Modular design and layout built to receive up to 3 MW of generators
 - Gas Conditioning System
 - Concrete pad
 - Mechanical equipment
 - 1-MW CAT A3516A+ generator or equivalent
 - 12 kV installation electrical infrastructure to support up to 3 MW (future neighboring projects)
 - PG&E interconnection installation
 - Process control system
- Clean up project site
- Verify completion of construction through creation of *Written Notice of Completion of Construction*. This document will include:
 - Photographs of:
 - Earthwork during construction
 - Trenching and piping during construction
 - Installation of each major system component
 - Completed system
- Prepare *System Training and Safety Manual*
- Prepare and conduct *Critical Project Review Presentation and Report*
- Complete Critical Project Review Meeting

Products:

- Written Notice of Completion of Construction
- System Training and Safety Manual (draft and final)

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- Critical Project Review Presentation and Report #2 (draft and final)

Subtask 3.2 Project Startup

The goals of this task are to start up the system and test equipment for operational readiness.

The Recipient shall:

- Conduct:
 - Process Hazard Analysis
 - Pre-Startup Safety Review
- Use System Training and Safety Manual to conduct training for operational personnel
- Develop *Operational Readiness Test Plan* that describes system performance testing and includes test objectives, procedures, conditions, facilities, and equipment
- Fill lagoon
- Startup and commission plant
- Execute Operational Readiness Testing in accordance with *Operational Readiness Test Plan*
- Prepare a *Written Notification of Pre-Commercial Operations* and submit it to the Commission Project Manager within fifteen working days of pre-commercial operation of the project. The Written Notification shall contain the following elements:
 - The date the project achieved pre-commercial operation(s)
 - A narrative on the current status of the project and initial operations
 - Any changes made from the project as originally proposed and reasons for those changes.
 - Photos of the operational facility.
- Prepare and conduct *Critical Project Review Presentation and Report*
- Complete Critical Project Review Meeting

Products:

- Operational Readiness Test Plan (draft and final)
- Written Notification of Pre-Commercial Operations
- Critical Project Review Presentation and Report #3 (draft and final)

Subtask 3.3 Operations

The goals of this task are to operate the facility for the 12-month operations period and comply with all applicable regulatory standards.

The Recipient shall:

- Operate the facility in accordance with all state and federal regulations.
- Prepare *Monthly Operations Reports*. The Operations Report shall include but are not be limited to the following information:
 - A narrative on operational highlights from the previous month, including any stoppages in production and a statement as to the project's compliance with regulatory requirements.
 - The total amount of products produced on a monthly basis. Products include:
 - Electricity exported to the PG&E distribution grid
 - Biogas produced
 - Bedding

Exhibit A Scope of Work

- Gallons of effluent water provided to farm's irrigation system
 - The total amount of dairy manure received and processed on a monthly basis
 - The direct operational costs of the project

Products:

- Monthly Operations Reports Format (draft and final for format of first Monthly Operations Report)
- Monthly Operations Reports (draft and final for format of first Monthly Operations Report)

Subtask 3.4 Data Collection and Analysis

The goals of this task are to collect operational data from the project, to analyze that data for economic and environmental impacts, and to include the data and analysis in the Final Report (subtask 1.6).

The Recipient shall:

- Develop *Data Collection Test Plan*, including measurement of the economic costs and impacts and environmental impacts.
- Collect in accordance with the Data Collection Test Plan 12 months of throughput, usage, and operations data from the project including, but not limited to:
 - Installed capital costs (in dollars per kilowatt or dollars per watt of net electrical capacity)
 - Feedstock consumption by energy content in million British thermal units (MMBtu)
 - Heat rate of the generation equipment, in Btu (heat input) per kWh (electrical output, net of parasitic load)
 - Capacity factor of the system
 - Avoided costs of grid electricity
 - Avoided waste disposal costs
 - Revenue from other sources
 - Payback period on all relevant investments
 - Define and assess the system footprint, visual impact, ingress and egress requirements, water consumption, atmospheric emissions and waste products.
 - Evaluate potential impacts including: a) GHG mitigation (in grams of carbon-dioxide-equivalent [CO₂e] per kilowatt-hour of electricity generated and total metric tons CO₂e; b) avoided emissions of methane (CH₄) in CO₂e and Hydrogen Sulfide (H₂S); and c) criteria pollution emission rates (NO_x, SO_x, particulate matter, volatile organic compounds).
 - Perform measurements likely using the following equipment: gas chromatographs, mass spectrometers, particulate filters, NO_x monitors, SO_x monitors, H₂S monitors, oxygen monitors, pH monitors, gas and liquid flow meters, thermometers, and sensors.
 - Electricity exported to the PG&E distribution grid
 - Biogas production
 - Tons of bedding produced
 - Tons of manure processed
 - Gallons of effluent water provided to farm
 - Expected air emissions reduction, for example:
 - Methane
 - Hydrogen Sulfide

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- Oxides of Nitrogen (phase 2)
 - Specific jobs and economic development resulting from this project
- Provide data on potential job creation, economic development, and increased state revenue as a result of expected future expansion.
- Compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments.
- Collect data, information, and analysis described above and include in the Final Report.
- Monitor the system using PLC monitoring and control system and log data in 15-minute intervals. (data typically logged includes biogas consumption, biogas vented, biogas composition, engine hours, kW, kWh and manure flow rates)

Products:

- Data Collection Test Plan (draft and final)
- Data collection information and analysis will be included in the Final Report (subtask 1.6) (draft and final)

TASK 4 Evaluation of Project Benefits (*Mandatory task*)

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 Levelized Cost of Electricity (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.

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

Exhibit A Scope of Work

TASK 5 Technology/Knowledge Transfer Activities (*Mandatory task*)

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 6 Production Readiness Plan (*Applicable only to agreements that fund the development of products that may be commercialized*)

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

Exhibit A Scope of Work

- 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)

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IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ABEC #2 LLC, DBA WEST STAR NORTH DAIRY BIOGAS

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-14-029 with **ABEC #2 LLC, dba West Star North Dairy Biogas** for a **\$4,000,000** grant to install and demonstrate an innovative, double-cell covered lagoon digester and 1 MW generation system. The WSN double cell lagoon is designed to enable the quantity of wastewater to vary by time of year. The project will prepare the generator platform to add a second MW for potential IOU dispatch, as a qualified energy storage system; 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 March 11, 2015.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Harriet Kallemeyn,
Secretariat