

GRANTS/CONTINGENT AWARD REQUEST



To: Grants and Loans Office

Date: 2/28/2013

Project Manager: Michael Sokol

Phone Number: 916-327-1416

Office: Energy Generation Research Office

Division: Energy Research and Development

MS- 43

Project Title: Repowering Humboldt with Community Scale Renewable Energy

Type of Request: (check one)

New Agreement: (include items A-F from below) Agreement Number: PIR-12-022

Program: PIER E / Renewables

Solicitation Name and/or Number: PON-12-502-04 (Community Scale Renewable Energy Development, Deployment and Integration)

Legal Name of Recipient: Redwood Coast Energy Authority

Recipient's Full Mailing Address: 517 5TH ST
EUREKA, CA 95501-1032

Recipient's Project Officer: Mathew Marshall Phone Number: 707-269-1700

Agreement Start Date: 6/19/2013 Agreement End Date: 3/31/2015

Amendment: (Check all that apply) Agreement Number: _____

Term Extension – New End Date: _____

Work Statement Revision (include Item A from below)

Budget Revision (include Item B from below)

Change of Scope (include Items A – F as applicable from below)

Other: _____

ITEMS TO ATTACH WITH REQUEST:

- A. Work Statement
- B. Budget
- C. Recipient Resolution, if applicable. (Resolution may be requested in Special Conditions if not currently available.)
- D. Special Conditions, if applicable.
- E. CEQA Compliance Form
- F. Other Documents as applicable
 - Copy of Score Sheets
 - Copy of Pre-Award Correspondence
 - Copy of All Other Relevant Documents

California Environmental Quality Act (CEQA)

CEC finds, based on recipient's documentation in compliance with CEQA:

Project exempt: _____ NOE filed: _____

Environmental Document prepared: _____ NOD filed: _____

Other: _____

CEC has made CEQA finding described in CEC-280, attached

Funding Information:

*Source #1: PIER-E Amount: \$ 1,750,000.00 Statute: 11- FY: 12-13 Budget List #: 501.027J

*Source #2: _____ Amount: \$ _____ Statute: _____ FY: _____ Budget List #: _____

*Source #3: _____ Amount: \$ _____ Statute: _____ FY: _____ Budget List #: _____

If federally funded, specify federal agreement number: _____

* Source Examples include ERPA, PIER-E, PIER-NG, FED, GRDA, ARFVT, OTHER.

Business Meeting Approval: (refer to Business Meeting Schedule)

Proposed Business Meeting Date: 5/8/2013 Consent Discussion

Business Meeting Participant: Michael Sokol Time Needed: 5 minutes

Agenda Notice Statement: (state purpose in layperson terms)

Possible approval of a Grant / Contingent Award to...

REDWOOD COAST ENERGY AUTHORITY. Possible approval of Agreement PIR-12-022 with Redwood Coast Energy Authority for a \$1,750,000 grant to demonstrate a state-of-the-art woody biomass gasifier/fuel cell combined heat and power system and develop, demonstrate, and evaluate an innovative local energy efficiency program. The agreement will include \$1,793,762 in match funding. (PIER electricity funding) Contact: Michael Sokol. (5 minutes)

Project Manager _____ Date _____ Office Manager _____ Date _____ Deputy Director _____ Date _____

Exhibit A WORK STATEMENT

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		ADMINISTRATION
2		INSTALL AND DEMONSTRATE DG BIOMASS CHP SYSTEM
2.1		DG Biomass Final System Design
2.2		DG Biomass Interconnection Agreement
2.3		DG Biomass Fuel Supply Contract
2.4		DG Biomass Equipment Procurement
2.5		DG Biomass Site and Facilities Work
2.6	X	DG Biomass System Installation
2.7		DG Biomass System Start-up and Commissioning
2.8		DG Biomass-Fuel Cell System Test Plan
2.9		DG Biomass Data Collection and Analysis
2.10		DG Biomass System Project Evaluation
3		DEVELOP, IMPLEMENT, AND EVALUATE MRVC ENERGY UPGRADE PROGRAM
3.1		MRVC Program Design and Setup
3.2		MRVC Financing Program Development
3.3		MRVC Contractor Recruitment and Training
3.4		MRVC Outreach, Marketing, and Workshops
3.5		MRVC Site Assessments
3.6		MRVC Energy Upgrade Project Assistance
3.7		MRVC Heat Pump Installation and Assessment
3.8		MRVC Electric Vehicle Charging Infrastructure
3.9		MRVC Program Evaluation and Scale-up
4		COLLECT AND ANALYZE DATA
5		PERFORM TECHNOLOGY TRANSFER ACTIVITIES
6		PREPARE PRODUCTION READINESS PLAN

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1		Schatz Energy Research Center	
2			Ballard Power Systems
3		Blue Lake Rancheria	
4			
5			
6			Ballard Power Systems

Exhibit A WORK STATEMENT

GLOSSARY

Specific terms and acronyms used throughout this scope of work are defined as follows:

Term/ Acronym	Definition
BPI	Building Performance Institute
CAM	Commission Agreement Manager
CHP	Combined heat and power
COP	Coefficient of performance
CPR	Critical Project Review
DG	Distributed generation
Energy Commission	California Energy Commission
EVSE	Electric vehicle supply equipment
HSPF	Heating seasonal performance factor
MRVC	Mad River Valley Community
PG&E	Pacific Gas and Electric Company
PIER	Public Interest Energy Research
PSA	Pressure swing adsorption
RCEA	Redwood Coast Energy Authority
SERC	Schatz Energy Research Center
TTP	Technology transfer plan

Problem Statement:

The *RePower Humboldt Strategic Plan*, developed by the Recipient and the Schatz Energy Research Center in 2012, outlines a set of strategies for developing local renewable energy resources in Humboldt County. Biomass energy, community-scale distributed generation, energy efficiency, electric vehicles, and heat pumps were all identified as key strategies for reducing greenhouse gas emissions, increasing renewable energy use, and providing local energy security. Next steps to move the plan forward include implementation of innovative, pilot-scale projects that successfully demonstrate cutting edge technologies, and programs that overcome barriers and exhibit economic viability.

Biomass energy systems must overcome technological, market, environmental, and cost barriers. Historically, there have not been suitable biomass energy systems for distributed power applications. Traditional stoker boiler and steam turbine systems are not typically economically viable unless they are sized to primarily meet heating needs. In addition, pollution control for these systems is disproportionately expensive. Biomass gasification systems open up new possibilities, but they have not been widely available for distributed energy applications. A biomass gasifier coupled with a fuel cell power system offers substantial increases in efficiency and cleaner operation, but this technology pairing operating on cellulosic fuel has not yet been demonstrated. However, due to recent research and development advances, technologies now exist to successfully demonstrate this distributed scale biomass energy system model. Doing

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so could result in a substantial new market for woody biomass-powered distributed generation.

Barriers to the successful deployment of energy efficiency technologies, distributed energy systems, and heat pumps are mostly due to market and cost issues. Innovative programs can be developed that address cost barriers through financing and bulk purchasing. Market barriers can be addressed through strategic programs that provide customer outreach, marketing, education, and technical assistance. Ultimately, to be successful, such a program must be structured to be self-funding and to use grants or subsidies only when necessary (for example, to overcome start-up costs).

Goals of the Agreement:

The goals of this Agreement are to successfully design, install, and operate a leading edge, forest-based biomass energy system that utilizes a gasifier and a proton exchange membrane fuel cell to provide combined heat and power for the Blue Lake Rancheria hotel/casino complex. The Recipient will evaluate system performance, assess opportunities for system scale-up and replication, and develop and implement an innovative, community-based energy upgrade program in the surrounding community that will demonstrate a sustainable model for financing and market deployment.

Objectives of the Agreement:

The objectives of this Agreement are to:

- Demonstrate a cutting edge distributed biomass gasification system that produces syngas with at least a 60% hydrogen content.
- Integrate the biomass gasifier with a pressure swing absorption cleanup system and a proton exchange membrane fuel cell and demonstrate successful operation of the first-of-its-kind integrated system. Successful operation will be measured as a peak electrical output of ≥ 175 kW, a capacity factor of $>75\%$, a biomass-to-electricity efficiency of $>25\%$, and an overall system energy efficiency (including waste heat recovery) of $>50\%$.
- Publish at least two journal articles, present at one conference, and post information on at least three energy organization web sites to publicize biomass project results
- Implement an innovative, community-based energy upgrade model that is shown to be economically self-sustaining and secures a robust participation of at least 20-60 site assessments and 10-20 energy upgrade projects.
- Secure the participation of one or more local lenders in a local energy upgrade financing program and provide loans to 5-10 participants.
- Install air source heat pumps in two facilities and monitor performance in terms of energy, cost, and greenhouse gas emission savings.
- Install and monitor two electric vehicle charging stations and record >100 charging events.

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TASK 1 ADMINISTRATION

Instructions for Submitting Electronic Files and Developing Software

Electronic File Format

The Recipient will deliver an electronic copy (CD ROM or memory stick or as otherwise specified by the Commission Project Manager (CPM) of the full text of any Agreement products in a compatible version of Microsoft Word (.doc).

The following describes the accepted formats of electronic data and documents provided to the Energy Commission as products and establishes the computer platforms, operating systems, and software versions that will be required to review and approve all software deliverables.

- Data sets will be in Microsoft (MS) Access or MS Excel file format.
- PC-based text documents will be in MS Word file format.
- Documents intended for public distribution will be in PDF file format, with the native file format provided as well.
- Project management documents will be in MS Project file format.

Software Application Development

If this Scope of Work includes any software application development, including but not limited to databases, websites, models, or modeling tools, the Recipient will use the following standard Application Architecture components in compatible versions:

- 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 Energy Commission's Information Technology Services Branch.

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Task 1.1 Attend Kick-off Meeting

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

The Recipient shall:

- Attend a “Kick-Off” meeting with the CPM, the Grants Officer, and a representative of the Accounting Office. The Recipient shall bring its Project Manager, Agreement Administrator, Accounting Officer, and others designated by the CPM to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the CPM will provide an agenda to all potential meeting participants.

The administrative portion of the meeting shall include, but not be limited to, the following:

- Discussion of the terms and conditions of the Agreement
- Discussion of Critical Project Review (Task 1.2)
- Match fund documentation (Task 1.6) *No work may be performed until this documentation is in place.*
- Permit documentation (Task 1.7)
- Discussion of subcontracts needed to carry out project (Task 1.8)

The technical portion of the meeting shall include, but not be limited to, the following:

- The CPM’s expectations for accomplishing tasks described in the Scope of Work
- An updated Schedule of Products
- Discussion of Progress Reports (Task 1.4)
- Discussion of Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
- Discussion of the Final Report (Task 1.5)

The CPM shall designate the date and location of this meeting.

- Submit an updated Schedule of Products, List of Match Funds, and List of Permits to the CPM.

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds
- Updated List of Permits

Commission Project Manager Product:

- Kick-Off Meeting Agenda

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Task 1.2 Critical Project Review (CPR) Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule, or budget.

CPRs provide the opportunity for frank discussions between the CPM and the Recipient. The CPM may schedule CPRs as necessary, and CPR costs will be borne by the Recipient.

Participants include the CPM and the Recipient, and may include the Commission Grants Officer, the Energy Research and Development Division technical lead, other Energy Commission staff and Management, and any other individuals selected by the CPM to provide support to the Energy Commission.

The Commission Project Manager shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These 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 Commission Project Manager.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion of both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. If the CPM 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 written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more products that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work on the project. This report shall be submitted along with any other products identified in this Scope of Work. The Recipient shall submit these documents to the CPM and any other designated reviewers at least 15 working days in advance of each CPR meeting.

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- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Commission Project Manager Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Task 1.3 Final Meeting

The goal of this task is to close out this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the CPM. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the discretion of the CPM.

The technical portion of the meeting shall involve the presentation of an assessment of the degree to which project and task goals and objectives were achieved, in addition to findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The CPM will determine the appropriate meeting participants.

The administrative portion of the meeting shall involve a discussion with the CPM and the Grants Officer about the following Agreement closeout items:

- Disposition of any equipment purchased with Energy Commission funds
- Energy Commission's request for specific "generated" data (not already provided in Agreement products)
- Need to document Recipient's disclosure of "subject inventions" developed under the Agreement
- "Surviving" Agreement provisions
- Final invoicing and release of retention

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- Prepare written documentation of any agreements made between the Recipient and Commission staff during the meeting.
- Prepare a schedule for completing the closeout activities for this Agreement.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report that summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the CPM within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in the Terms and Conditions of this Agreement.
- In each Monthly Progress Report and invoice, document and verify:
 - Energy Commission funds received by California-Based Entities (CBEs);
 - Energy Commission funds spent in California; and Match fund expenditures
 - Provide synopsis of project progress.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

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The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will also prepare a confidential version of the Final Report, the Recipient shall perform the following activities for both the public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the approved outline and the latest version of the Final Report guidelines which will be provided by the CPM. The CPM shall provide written comments on the Draft Final Report within 15 working days of receipt. The Final Report must be completed at least 90 days before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Draft Outline of the Final Report
- Final Outline of the Final Report
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Match Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of Energy Commission funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the CPM at least 2 working days prior to the

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- Amount of each cash match fund, its source (including a contact name, address and telephone number), and the task(s) to which the match funds will be applied.
- Amount of each in-kind contribution, a description, documented market or book value, its 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 shall identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. 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 letter including the appropriate information to the CPM if during the course of the Agreement additional match funds are received.
- Provide a letter to the CPM within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

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Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the CPM at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule, and copies of the permits. The implications to the Agreement 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 the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide an updated list of permits (including the appropriate information on each permit) and an updated schedule to the CPM.
- As permits are obtained, send a copy of each approved permit to the CPM.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CPM within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)
- A copy of each approved permit (if applicable)

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Task 1.8 Obtain and Execute Subcontracts

The goal of this task is to ensure quality products and to procure subcontracts required to carry out the tasks under this Agreement consistent with the terms and conditions of this Agreement and the Recipient's own procurement policies and procedures. This task will also provide the Energy Commission an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement, and that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Manage and coordinate subcontractor activities.
- Submit a draft of each subcontract required to conduct the work under this Agreement to the Commission Agreement Manager for review.
- Submit a final copy of the executed subcontract.
- If the Recipient decides to add new subcontractors, it shall notify the Commission Agreement Manager.

Products:

- Letter describing the subcontracts needed, or stating that no subcontracts are required
- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 INSTALL AND DEMONSTRATE DG BIOMASS CHP SYSTEM

Task 2.1 DG Biomass Final System Design

The goal of this task is to finalize the design of the Blue Lake Rancheria's distributed generation biomass energy system. The system will consist of a fuel storage and delivery facility, a biomass gasifier unit, a pressure swing absorption clean-up unit, a proton exchange membrane fuel cell, waste heat recovery equipment, and associated power conditioning and switch gear for grid intertie application.

The Recipient shall:

- Finalize specifications for:
 - All required site and facilities work
 - All system components (fuel conveyance, gasification, cleanup, fuel cell, waste heat recovery, and balance of system)
 - System integration
 - System control and monitoring
- Prepare final versions of the following:
 - Piping and instrumentation diagrams

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- Site plans and facility layouts
- Civil engineering drawings
- Mechanical engineering drawings
- Electrical engineering drawings
- Prepare a DG Biomass Final System Design Report that includes but is not limited to:
 - A general site plan and facility layout
 - A general process diagram or major component diagram

Products:

- DG Biomass Final System Design Report (No Draft)

Task 2.2 DG Biomass Interconnection Agreement

The goal of this task is to execute all required agreements with the Pacific Gas and Electric Company (PG&E) to allow for connection of the distributed biomass energy system on the customer side of the meter for use in parallel with the PG&E grid.

The Recipient shall:

- Assess interconnection options and requirements, including cost and rate implications.
- Negotiate required interconnection agreements with the local electric utility.
- Execute a final interconnection agreement.
- Prepare written notification of the executed interconnection agreement.

Products:

- Written notification of the final executed interconnection agreement (No Draft)

Task 2.3 DG Biomass Fuel Supply Contract

The goal of this task is to secure a fuel supply contract for saw dust fuel to be delivered to the Blue Lake Rancheria facility.

The Recipient shall:

- Assess options for obtaining saw dust fuel from local suppliers.
- Negotiate a fuel supply contract for saw dust fuel delivery to the Blue Lake Rancheria.
- Execute a contract for saw dust fuel delivery to the Blue Lake Rancheria.
- Prepare written notification of the executed fuel supply contract.

Products:

- Written notification of final executed fuel supply contract (No Draft)

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Task 2.4 DG Biomass Equipment Procurement

The goal of this task is to procure all equipment associated with the DG biomass energy system.

The Recipient shall:

- Prepare a final list of components to be procured. The list will include a brief equipment description and will identify the manufacturer, part or model number, cost estimate, and vendor.
- Obtain quotes, as needed, for major components.
- Procure all required equipment needed for the installation of the DG biomass energy system.
- Prepare a final list of components that were procured.
- Prepare written notification of complete component procurement.

Products:

- Written notification of complete component procurement (No Draft)

Task 2.5 DG Biomass Site and Facilities Work

The goal of this task is to perform all required site and facilities work to support the installation of the DG biomass system.

The Recipient shall:

- Develop a list of all required site and facilities work.
- Develop specifications for all required site and facilities work.
- Obtain quotes for site and facilities work, as needed.
- Negotiate contracts for site and facilities work, as needed.
- Perform all necessary site and facilities work.
- Review all site and facilities work and confirm that it is performed according to specifications.
- Prepare photographs of major site and facilities work.
- Prepare written notification of the completion of all site and facilities work.

Products:

- Photographs of major site and facilities work (No Draft)
- Written notification of completion of all site and facilities work (No Draft)

Task 2.6 DG Biomass System Installation

The goal of this task is to install the DG biomass energy system.

The Recipient shall:

- Install all DG biomass energy system components. This includes components associated with fuel storage, processing, conveyance,

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gasification, gas cleanup, fuel cell, electric interconnection, waste heat recovery, system control and data acquisition systems.

- Take photographs of DG biomass system installation.
- Prepare a written notification of DG biomass system installation.
- Participate in CPR activities per Task 1.2, including preparation of a CPR Report.

Products:

- Photographs of DG biomass system installation (No Draft)
- Written notification of DG biomass system installation (No Draft)
- CPR Report (No Draft)

Task 2.7 DG Biomass System Start-up and Commissioning

The goal of this task is to start-up and commission the DG biomass energy system.

The Recipient shall:

- Develop a DG Biomass System Start-up and Commissioning Plan that includes but is not limited to:
 - Field inspection
 - Safety system operational test
 - System pressure test
 - Instrument verification
 - Component operational test
 - System operational test
- Conduct all start-up and commissioning procedures.
- Confirm proper operation of the DG biomass energy system.
- Prepare written notification of successful DG biomass system start-up and commissioning.

Products:

- Written notification of successful DG biomass system start-up and commissioning (No Draft)

Task 2.8 DG Biomass-Fuel Cell System Test Plan

The goal of this task is to develop a Biomass-Fuel Cell System Test Plan. The objectives of the plan will be to evaluate the performance of the gasifier, PSA, and fuel cell subsystems individually, as well as the integrated system as a whole.

The Recipient shall:

- Develop a Biomass-Fuel Cell System Test Plan that includes, at a minimum:
 - Performance evaluation of the gasifier, PSA, fuel cell and overall integrated system

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- Measurement of component and system energy conversion efficiency
- Measurement of component and system availability
- Measurement of component and system capacity factor

Products:

- Biomass-Fuel Cell System Test Plan (Draft)
- Biomass-Fuel Cell System Test Plan (Final)

Task 2.9 DG Biomass Data Collection and Analysis

The goals of this task are to operate the DG biomass system and to collect operating data for a 30 to 180 day period. Data will be analyzed to assess the performance of the DG biomass energy system according to the Biomass-Fuel Cell System Test Plan.

The Recipient shall:

- Operate the DG biomass system for 30-180 days and collect operating data.
- Analyze operating data and calculate system performance metrics.
- Prepare a DG Biomass System Performance Report that includes but is not limited to:
 - Analysis of the DG biomass system for 30-180 day operating period
 - Calculated system and component performance metrics, including energy conversion efficiency, availability, and capacity factor
 - Documentation of system installation and operating cost
 - Evaluation of system cost-effectiveness (simple payback, life cycle analysis)

Products:

- DG Biomass System Performance Report (Draft)
- DG Biomass System Performance Report (Final)

Task 2.10 DG Biomass System Project Evaluation

The goal of this task is to use the DG biomass system performance data to evaluate the potential for system replication.

The Recipient shall:

- Assess opportunities for replication, including economic viability.
- Identify required parameters for successful scale-up and replication (e.g., system performance, fuel costs, energy costs, capital costs, and by-product value).
- Identify required improvements for successful scale-up and replication.
- Prepare a DG Biomass System Replication Analysis Report that documents opportunities for system scale-up and replication.

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Products:

- DG Biomass System Replication Analysis Report (Draft)
- DG Biomass System Replication Analysis Report (Final)

TASK 3 DEVELOP, IMPLEMENT, AND EVALUATE MRVC ENERGY UPGRADE PROGRAM

Task 3.1 MRVC Program Design and Setup

The goal of this task is to develop a replicable, community-based energy upgrade program design that will effectively target high-priority locations for renewable energy and energy efficiency upgrades in homes, businesses, and local-government facilities.

The Recipient shall:

- Develop a MRVC Energy Upgrade Program Implementation Plan to establish detailed tactics and schedules for conducting site assessments, contractor training, outreach, and workshops to target opportunities with high potential to contribute to the renewable energy and energy efficiency goals identified in the RePower Humboldt vision.
- With input from local contractors and other topic experts, develop contractor guidelines and participation protocols that will be used in contractor trainings and will establish quality assurance and verification requirements for any upgrade projects that result from the project.
- Set up required project tools and resources, participation forms, and site assessment forms and software. Develop any needed customer report templates and create energy upgrade project management templates.
- Develop MRVC Energy Upgrade Program marketing and outreach materials to target contractors, high priority installations, and relevant community stakeholders. The materials will include but not be limited to one presentation and one informational brochure.

Products:

- MRVC Energy Upgrade Program Implementation Plan (No Draft)
- MRVC Energy Upgrade Program marketing and outreach materials (No Draft)

Task 3.2 MRVC Financing Program Development

The goal of this task is to develop a localized energy upgrade financing model that can be aligned with and implemented as a component of the energy upgrade program and the RePower Humboldt vision.

Exhibit A WORK STATEMENT

The Recipient shall:

- Identify and recruit local lenders interested in participating in an energy upgrade financing program.
- Develop a list of participating lenders.
- Work with lenders to develop a model financing program and associated guidelines to optimize opportunities for localized renewable energy and energy efficiency projects.
- Develop information and outreach materials that can be used to market the financing program and provide program information to high priority installations and relevant stakeholders.
- Develop a MRVC Financing Program Guide to define program procedures and develop necessary tracking forms for verification of program results.

Products:

- List of participating lenders (No Draft)
- MRVC Financing Program Guide (no Draft)

Task 3.3 MRVC Contractor Recruitment and Training

The goal of this task is to identify, recruit, and train local contractors qualified to complete the high-priority residential and commercial renewable energy and energy efficiency upgrade projects identified in the MRVC Program Implementation Plan.

The Recipient shall:

- Develop and implement targeted outreach activities to recruit contractors for the training program in collaboration with the local Builders Association and/or other appropriate trade and community organizations.
- Issue a formal request for participation to local contractors to build a database of qualified participating contractors.
- Recruit contractors and develop a List of Participating Contractors.
- Work with contractors to refine program design to ensure that program protocols and systems can be effectively implemented, and meet their business needs and the RePower Humboldt vision.
- Identify any additional required contractor training, such as Building Performance Institute (BPI) Building Analyst Professional Certification, to streamline the localized deployment and installation of renewable energy and energy efficiency technologies.
- Assist local contractors with enrollment in PG&E's Whole-Home Upgrade rebate program, the state solar rebate program, and/or other programs as applicable, to maximize the value of identified energy upgrade projects to local electricity customers.
- Provide additional technical training on participation protocols, installations standards, and energy upgrade best practices as needed.
- Prepare a List of Contractor Training Activities performed in this task.

Exhibit A WORK STATEMENT

Products:

- List of Participating Contractors (No Draft)
- List of Contractor Training Activities (No Draft)

TASK 3.4 MRVC Outreach, Marketing, and Workshops

The goal of this task is to promote the MRVC Energy Upgrade Program to targeted customer groups in the City of Blue Lake, the Blue Lake Rancheria, and the broader surrounding Mad River Valley Community to maximize participation in the program by high-priority residential, commercial, industrial, and government stakeholders.

The Recipient shall:

- Develop workshop Presentation Materials and a curriculum. Workshops will be focused on helping local energy consumers identify cost-effective renewable energy and energy efficiency upgrade options specific to their facilities/homes.
- Conduct targeted marketing and outreach activities (via print, online, and radio channels) to encourage local participation and support for the overall energy upgrade program, workshops, and training opportunities.
- Schedule and conduct site visits at high priority residential and commercial facilities, and participate in relevant community events to recruit participants for the training and orientation workshops.
- Schedule venues for workshops and convenient local facilities, and coordinate with participating contractors and other guest presenters.
- Conduct 2-4 workshops, with a cumulative target of 100 participants consisting of local stakeholders, business owners, and homeowners identified as high-priority for renewable energy and energy efficiency upgrades.
- Prepare a Summary of Marketing and Outreach Activities conducted in this task.
- Maintain a List of MRVC Outreach Workshop Participants.

Products:

- Workshop Presentation Materials (No Draft)
- Summary of Marketing and Outreach Activities (No Draft)
- List of MRVC Outreach Workshop Participants (No Draft)

Task 3.5 MRVC Site Assessments

The goal of this task is to conduct detailed and comprehensive energy site assessments for local residential and business facilities identified as high priority for renewable energy and energy efficiency upgrades.

Exhibit A WORK STATEMENT

The Recipient shall:

- Schedule local facility site assessments, starting with those facilities identified as high-priority during energy upgrade activities.
- Conduct detailed renewable energy and energy efficiency resource evaluations and comprehensive energy performance assessments for participating sites. Detailed assessments will include:
 - Analysis of facility's economic potential for solar PV, heat pumps, and energy efficiency technologies.
 - Specific priority locations for the installation of identified systems.
 - Technical system performance estimates including total capacity installed, expected operational lifetime, and lifetime energy generated or saved by each system.
 - Cost analyses of the overall investment needed to install and maintain identified systems, including expected payback period, and return on investment.
- Develop detailed site assessment reports with technical and cost estimates for each site based on assessment results, and present the reports to participants.
- Maintain a List of Site Assessments Performed and Detailed Assessment Reports Delivered.

Products:

- List of Site Assessments Performed and Detailed Assessment Reports Delivered (No Draft)

Task 3.6 MRVC Energy Upgrade Project Assistance

The goal of this task is to provide hands-on implementation assistance and start-to-finish project management support to participants who opt to proceed with an energy upgrade project.

The Recipient shall:

- Provide participants with assistance with contractor selection and referral to qualified participating contractors suited to complete their project.
- Work with participants to obtain project financing if needed.
- Assist participants and contractors with the necessary documentation and paperwork for processing rebates and other incentives.
- Provide project quality assurance through post-project inspection and testing of work completed.
- Maintain a database of all Energy Upgrade project assistance activities, including a list of all participants and a record of the milestones reached for each participant in the program. Milestones may include the following:
 - Referred to contractor
 - Applied for project financing
 - Received project financing

Exhibit A WORK STATEMENT

- Applied for incentives
- Received incentives
- Project installed
- Post-inspection technical and economic performance results determined
- Prepare a Energy Upgrade Project Assistance Activities Report documenting Energy Upgrade project assistance activities based on queries of the project database, including summaries of:
 - Referrals to other programs
 - Number and type of upgrade projects installed
 - Number of projects financed
 - Projected energy-efficiency savings, renewable energy generation added, and resultant greenhouse gas savings
 - Potential for community-wide replication

Products:

- Energy Upgrade Project Assistance Activities Report (No Draft)

Task 3.7 MRVC Heat Pump Installation and Assessment

The goal of this task is to demonstrate and verify the localized technical benefits and economic viability of air source heat pump systems in Humboldt County. Air source heat pump systems will be installed at two facilities and heat pump system performance will be monitored, evaluated, and used to verify the cost-effective greenhouse gas savings suggested by the RePower Humboldt study.

The Recipient shall:

- Identify priority opportunities for air source heat pump installations based on results of Energy Upgrade program site assessment activities.
- Recruit at least two local participants for heat pump installations.
- Provide Energy Upgrade project assistance to facilitate the purchase and installation of heat pumps.
- Develop a Heat Pump Performance Test Plan that includes but is not limited to:
 - Measurement of heat pump electricity consumption
 - Measurement of heat pump performance (HSPF/COP)
 - Estimate of energy cost savings compared to base case heating system
 - Estimate of greenhouse gas emission reductions compared to base case heating system
 - Evaluation of system cost effectiveness (simple payback, life cycle analysis)
- Install heat pump systems, including data monitoring equipment to track heat pump performance.
- Monitor heat pump performance for one heating season.

Exhibit A WORK STATEMENT

- Assess heat pump performance based on the Heat Pump Performance Test Plan.
- Prepare a Heat Pump Performance Report documenting heat pump performance for one heating season.

Products:

- Heat Pump Performance Test Plan (No Draft)
- Heat Pump Performance Report (Draft)
- Heat Pump Performance Report (Final)

Task 3.8 MRVC Electric Vehicle Charging Infrastructure

The goal of this task is to demonstrate and verify the local technical and economic benefits of electric vehicle charging stations in Humboldt County. Electric vehicle supply equipment (EVSE) will be purchased and installed at two facilities in the Mad River Valley. Use of these charging stations will be monitored, evaluated, and used to verify the cost-effective greenhouse gas savings suggested by the RePower Humboldt study.

The Recipient shall:

- Identify two suitable locations for the installation of electric vehicle charging stations in the Mad River Valley Community.
- Purchase two EVSE charging stations.
- Work with property owners to install EVSE.
- Prepare documentation and photographs of EVSE installations.
- Monitor the use of the EVSE.
- Prepare an EVSE Usage Report that includes, but is not limited to:
 - Duty factor (percentage of time EVSE is utilized)
 - Electricity consumption (kWh)
 - Typical demand load profile
 - Estimate of greenhouse gas reductions
- Work with the North Coast Plug-in Electric Vehicle Coordinating Council (part of a project funded by CEC ARV-11-006) to publicize the use of the EVSE and educate the public about its benefits.

Products:

- Photographs of EVSE installations (No Draft)
- EVSE Usage Report (No Draft)

Task 3.9 MRVC Program Evaluation and Scale-up

The goal of this task is to evaluate MRVC Energy Upgrade pilot program results and develop a detailed plan for ongoing, sustainable implementation across all of Humboldt County.

Exhibit A WORK STATEMENT

The Recipient shall:

- Compile records of program activities and results.
- Compile estimates of program costs.
- Assess program cost-effectiveness.
- Evaluate opportunities for program expansion throughout Humboldt County.
- Prepare a brief MRCV Energy Upgrade Program Results and Opportunities Report documenting program results and opportunities for expansion.
- Develop a Plan for Countywide Implementation of the Energy Upgrade Program.

Products:

- MRVC Energy Upgrade Program Results and Opportunities Report (No Draft)
- Plan for Countywide Implementation of the Energy Upgrade Program (No Draft)

TASK 4 DATA COLLECTION AND ANALYSIS

The goals of this task are to collect operational data, analyze the data for economic and environmental impacts, and include the data and analysis in the Final Report.

The Recipient shall:

- Develop a data collection test plan based on input from the Energy Commission project manager. The plan will include but not limited to a discussion of the following:
 - Energy savings and estimated cost savings
 - Greenhouse gas reductions
 - Other non-energy benefits
- Provide data on potential job creation, market potential, economic development, and increased state revenue as a result of expected future expansion.
- Provide an estimate of the project's energy savings and other benefits, such as statewide energy savings once market potential has been realized.
- Compare project performance and expectations provided in the proposal to actual project performance and accomplishments.
- Prepare a Data Analysis Report.

Products:

- Draft Data Analysis Report
- Final Data Analysis Report

Exhibit A WORK STATEMENT

TASK 5 PERFORM TECHNOLOGY TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results and lessons learned available to key decision-makers, and to disseminate the project results to facilitate replication in other communities.

The Recipient shall:

- Prepare a Technology Transfer Plan (TTP) that explains how the knowledge gained in this project will be made available to the public. The level of detail expected is least for research-related projects and highest for demonstration projects. Key elements from this report shall be included in the Final Report for this project.
- As part of the TTP, prepare a plan to share best practices and results from the DG Biomass CHP project. The plan will include the following components:
 - Develop a project case study document for DG Biomass CHP project results and opportunities for replication.
 - Publish at least two journal articles documenting DG Biomass CHP project results.
 - Prepare a Conference Presentation for DG Biomass CHP project.
 - Present project results at a “green energy” conference in California.
 - Post project results on at least three “green energy” organization websites (e.g., the Pacific Clean Energy Application Center).
 - Prepare a Webinar Presentation for DG Biomass CHP project.
 - Conduct webinars to share and promote project results.
 - Produce a short video clip that describes the project.
- As part of the TTP, prepare a plan to share best practices and results from the Energy Upgrade program. The plan will include the following components:
 - Develop an Energy Upgrade Replication Package that includes program materials, best-practices, and protocols.
 - Make the Energy Upgrade Replication Package and other program information and data freely available and easily accessible through the Recipient’s website and other channels.
 - Promote the Energy Upgrade program model and results through local government networking events and the Statewide Energy Efficiency Collaborative.
- Conduct technology transfer activities in accordance with the Technology Transfer Plan. These activities will be reported in the Monthly Progress Reports.

Exhibit A WORK STATEMENT

- Indicate the intended use(s) and users of the project results.

Products:

- Draft Technology Transfer Plan
- Final Technology Transfer Plan
- Project case study document for DG Biomass CHP project (No Draft)
- Two journal articles documenting results of DG Biomass CHP project (No Draft)
- Conference Presentation for DG Biomass CHP project (No Draft)
- Webinar Presentation for DG Biomass CHP project (No Draft)
- Energy Upgrade Replication Package (No Draft)

TASK 6 PREPARE PRODUCTION READINESS PLAN

The goal of the plan is to determine the steps that will lead to the manufacturing of the 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 its state of development. As appropriate, the plan will include but not be limited to a discussion of 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"
 - A projected "should cost" for the product when in production
 - The expected investment threshold to launch the commercial product
 - An implementation plan to ramp up to full production

Products:

- Draft Production Readiness Plan
- Final Production Readiness Plan