STATE OF CALIFORNIA

GRANTS/CONTINGENT AWARD REQUEST

CEC-270 (Revised 02/10) CALIFORNIA ENERGY COMMISSION

To: Grants and Loans Office Date: 7/26/2012

Project Manager: Johann Karkheck Phone Number: 916-327-2457
Office: Energy Systems Research Office Division: Energy Research and Development MS- 43
Project Title: Wind Firming EnergyFarm

Type of Request: *(check one)*

☐ **New Agreement:** *(include items A-F from below)* Agreement Number: Assigned by G&L Office
Program: PIER E / Energy Technology Systems Integration
Solicitation Name and/or Number:
Legal Name of Recipient: Primus Power Corporation
Recipient's Full Mailing Address: 3967 Trust Way
Hayward, CA 94545-3723
Recipient's Project Officer: Rick Winter Phone Number: 925-360-8444
Agreement Start Date: 7/1/2011 Agreement End Date: 3/31/2015

☒ **Amendment :** *(Check all that apply)* Agreement Number: PIR-10-029
- ☐ 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: Amount: $ Statute: FY: Budget List #:
*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: 11/14/2012 ☒ Consent ☐ Discussion
Business Meeting Participant: Johann Karkheck Time Needed: minutes

Agenda Notice Statement: *(state purpose in layperson terms)*

Possible approval of a ☒ Grant / ☐ Contingent Award to…

Possible approval Amendment 1 to Agreement PIR-10-029 with Primus Power Corporation to realign the task names and numbers of the California Energy Commission grant with those of the corresponding Department of Energy (DOE) grant. The amendment will also reallocate direct labor and fringe benefit funds from the technician to the engineering position to accommodate changes in the Primus Power workforce. The overall

Project Manager	Date	Office Manager	Date	Deputy Director	Date

Exhibit A
WORK STATEMENT

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		ADMINISTRATION
2		UPDATE PROJECT MANAGEMENT PLAN
3		DEVELOP INTEROPERABILITY AND CYBER SECURITY PLAN
4		DEVELOP METRICS AND BENEFITS REPORTING PLAN
5		DETAILED REQUIREMENTS SPECIFICATION
6		ENERGYCELL™ DESIGN
7		ENERGYPOD™ **DESIGN** ~~INTEGRATION AND VALIDATION~~
8		**SUPERVISORY CONTROL & DATA ACQUISITION (SCADA) SYSTEM DESIGN**
9 ~~8~~	X	**SELL ENERGYFARM™** ~~PERFORMANCE REVIEW~~
10 ~~9~~		**MANUFACTURING** ~~DESIGN AND BUILD ENERGYPOD™ PRODUCTION FACILITY~~
11 ~~10~~		**ENERGYFARM™** BUILD ~~ENERGYPODS™~~
~~11~~		~~DESIGN AND INSTALL ENERGYFARM™ DATA ACQUISITION SYSTEM~~
12		**ENERGYFARM™ DEPLOYMENT** ~~DEPLOY UTILITY PARTNER~~
~~13~~		~~COMMISSION ENERGYFARM™ AND INITIATE DATA ACQUISITION SYSTEM~~
13 ~~14~~	X	ACCUMULATE 24 MONTHS OF OPERATIONAL DATA
14 ~~15~~		TECHNOLOGY TRANSFER ACTIVITIES

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Rick Winter (Primus Power Corp.)		Modesto Irrigation District
2	Tom Stepien (Primus Power Corp.)		

GLOSSARY

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

Term/ Acronym	Definition
CPR	Critical Project Review

Term/ Acronym	Definition
DOE	United States Department of Energy
Energy Commission	California Energy Commission
MW	Megawatt
MWh	Megawatt Hour
PIER	Public Interest Energy Research
RD&D	Research, Development and Demonstration

Problem Statement:
Large, grid-connected energy storage provides significant value in numerous applications, primarily transmission support, frequency regulation, distribution and transmission asset deferral, energy arbitrage, and renewables firming. In order to capture large storage markets and the value they represent, much lower cost storage technology is required. There is still much work to be done, however, to introduce cost-effective, flexible battery technologies into the market. In addition, while the benefits of large, grid-connected energy storage systems can often be quantified, they often flow to multiple stakeholders, creating even more challenges in developing compelling business cases even though their positive impact on overall system efficiency may be considerable.

A variety of energy storage solutions either exist or are emerging in the marketplace; each have their advantages and disadvantages from a capital and operating cost, reliability, and functionality perspective. The United States Department of Energy (DOE) and the California Energy Commission have both implemented programs to develop and bring to market cost-effective energy storage systems. Systems of particular interest are those that have the flexibility to capture revenue streams from multiple applications.

In this project, Primus Power Corporation (the "Recipient") is developing and installing a 25 megawatt (MW)/75 megawatt hour (MWh) battery storage system at a utility location for a wind firming application. Primus Power is working with a utility to address its need for wind firming as it implements its program to fulfill a 33% renewables requirement. The Primus system will replace a planned 25 MW fossil fuel plant required to compensate for the variable nature of wind energy to provide load shifting capabilities. Secondary applications of the Primus system will also be demonstrated and evaluated.

The Recipient describes its energy storage units as below:

EnergyCell: **Hermetically sealed battery module (20 kW/60 kWh) made from low cost materials with greater than 14,000 cycles life.** ~~A basic modular battery (20 kW/60 kWh) package made from low cost materials and hermetically sealed, and has greater than 14,000 cycles life.~~

EnergyPod™: **A factory integrated 20' plug & play containerized grid storage product (250kW/750kWh) with a design life of 20 years.** ~~A modular battery package (660 kW/2MWh) of 33 modular EnergyCells fitted with commercial power electronics and control system, and has a design life of 15 years.~~

PowerBox : A factory integrated 20' plug & play containerized 2MW power electronics and control system capable of supporting 8 EnergyPods™.

EnergyFarm: **A field-deployed grid storage system made up of an array of EnergyPods™ and PowerBoxes with a power footprint of 100MW/acre.** ~~A fully functional energy storage system (25 MW/75 MWh) made up of multiple modular EnergyPods.~~

This Agreement supplements the Recipient's American and Recovery Reinvestment Act of 2009 grant under DOE's Smart Grid Demonstrations Funding Opportunity Announcement (DE-FOA-0000036). This Agreement funds Tasks 6 (EnergyCell™ Design) and 9 (Design and Build EnergyPod™ Production Facility).

Goals of the Agreement:
The goal of this Agreement is to trigger rapid adoption of grid storage systems in the United States (U.S.) by demonstrating a low-cost, robust and flexible EnergyFarm™.

Specific goals of the Wind Firming EnergyFarm™ project include:

1. Develop, integrate, and field demonstrate a Zinc-based flow battery storage system;
2. Provide a low-cost system with a footprint consistent with or smaller than competing technologies; and
3. Demonstrate primary and secondary applications including: renewable firming, strategic local peak shaving, automated load shifting, and ancillary services.

Objectives of the Agreement:
The objectives of the EnergyFarm™ Smart Grid Storage Project are to:

1. Trigger rapid adoption of grid storage systems in the U.S. by demonstrating a low-cost, robust and flexible EnergyFarm™.
2. Accelerate adoption of renewable energy and enhance grid stability by firming the output of wind and solar farms.
3. Demonstrate improved grid asset utilization by storing energy during off-peak periods for dispatch during local load peaks.
4. Establish an advanced battery manufacturing industry in the U.S.
5. Reduce emissions and water usage by utilities.

The project will specifically develop, field test, install, and monitor a cost-effective, flexible, and reliable 25MW/75MWh battery storage system in a wind firming application. The project will be conducted in three phases:

Phase I will provide a concise project plan and federal environmental compliance review. It will also yield a detailed product definition reflecting the specific utility requirements of the applications based on field interviews and internal utility reporting.

Phase II will validate technology performance, final product design and functionality. The EnergyFarm™ will be installed at the utility partner's site.

Phase III will quantify the economic and environmental benefits of the deployed EnergyFarm™ and document field reliability.

Product Guidelines:
For complete product guidelines, refer to Section 5 in the Terms and Conditions.

TASK 1 ADMINISTRATION

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 Commission Project Manager, 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 Commission Project Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting,

the Commission Project Manager 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)
- Permit documentation (Task 1.7)

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

- The Commission Project Manager'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 Commission Project Manager shall designate the date and location of this meeting.

Recipient Products:

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

Commission Project Manager Product:

- Kick-Off Meeting Agenda

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 Energy Commission and the Recipient. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Project Manager and as shown in the Technical Task List above. However, the Commission Project Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Recipient.

Participants include the Commission Project Manager and the Recipient and may include the Commission Grants Officer, the Public Interest Energy Research (PIER) Program Team Lead, other Energy Commission staff and Management as well as other

individuals selected by the Commission Project Manager to provide support to the Energy Commission.

If DOE is conducting similar meetings, the Recipient shall notify and invite the Commission project manager to participate, either by teleconference or by actual meeting attendance. The DOE required meetings can be used in place of the Commission's CPR meetings, at the discretion of the Commission project manager.

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.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on 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 continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see the Terms and Conditions). If the Commission Project Manager concludes that satisfactory progress is not being made, this conclusion will be referred to the Energy Commission's Research, Development and Demonstration (RD&D) Policy Committee for its concurrence.
- 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 product(s) 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 of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the Commission Project Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.
- Recipient will provide copies of any DOE correspondence (emails, reports, letters, etc.) that relate to the project status. This includes copies of project performance reviews on Recipient work and summaries and results of project review meetings with DOE.

Commission Project Manager Products:

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

Recipient Product:

- CPR Report(s)
- DOE correspondence and reporting

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement. If DOE is conducting a similar final meeting, the Recipient shall notify and invite the Commission project manager to participate, either by teleconference or by actual meeting attendance. The DOE required meeting can be used in place of the Commission's final meeting, at the discretion of the Commission project manager. However, all items listed in this task will need to be covered in the meeting.

The Recipient shall:

- Meet with Energy Commission staff to present the 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 Commission Project Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Project Manager.

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

  The administrative portion of the meeting shall be a discussion with the Commission Project Manager and the Grants Officer about the following Agreement closeout items:
  - What to do with any equipment purchased with Energy Commission funds (Options)
  - 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, such as repayment provisions and confidential Products

- o Final invoicing and release of retention
- o Prepare a schedule for completing the closeout activities for this Agreement.
- o Copies of all correspondence and reports discussing DOE's findings on the project, and future disposition of the project, if applicable. When directed by the Commission project manager, recipient will provide copies of any DOE correspondence (emails, reports, letters, etc.) that relate to project performance.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities
- DOE correspondence on project findings and results

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.

With Commission project manager approval, the Recipient can submit a DOE Progress Report in lieu of the required Commission report if contains the information listed in Attachment 1 of the Terms and Conditions.

The Recipient shall:

- Prepare Monthly Progress Reports which summarize 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 Commission Project Manager 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.
- Unless otherwise directed by the Commission Project Manager, each Progress Report must contain any reports made to DOE, including summaries of meetings with DOE, as they relate to the project outcome and performance. Include names and contacts of DOE representatives.

Product:

- Monthly Progress Reports
- Copies of DOE reporting and meeting summaries

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.

The final report shall describe the following at a minimum: a) original purpose, approach, activities performed, results and conclusions of the work done under this Agreement; b) how the project advanced science and technology to the benefit of California's ratepayers and the barriers overcome; c) assessment of the success of the project as measured by the degree to which goals and objectives were achieved; d) how the project supported California's economic recovery in the near term and number of jobs created or sustained; e) how the project results will be used by California industry, markets and others; f) projected cost reduction impact and other benefits resulting from the project; g) discuss the project budget, including the total project cost and all the funding partners and their cost share; h) discuss how the Energy Commission funding was spent on the project, including any unique products and benefits; i) observations, conclusions and recommendations for further RD&D projects and improvements to the PIER project management process.

If a final report is required by DOE, the Recipient will include a copy of it along with the Energy Commission's final report requirements. In addition, the Recipient shall submit the draft final DOE report to the Energy Commission for review at the same time it submits it to DOE.

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

The Recipient shall:

- Provide a draft copy of the Final Report including a copy of the draft submitted to the U.S. DOE in response to the American Recovery and Reinvestment Act Funding Opportunity Notice for which an award was received. The Final Report must be completed on or before the end of the Agreement Term.
- Submit written correspondence from DOE regarding acceptance of the final report.

Products:

- Draft Final Report, including a copy of the draft report submitted to DOE
- Final Report, including a copy of the final report submitted to DOE

- Written correspondence from DOE regarding acceptance of final report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for 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 PIER 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 PIER 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 Commission Project Manager at least 2 working days prior to the kick-off meeting. The letter needs to identify the following at a minimum:
  - 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, and 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 and 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.
- 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 the appropriate information to the Commission Project Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Project Manager 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
- Copy(ies) of each match fund commitment letter(s)

- 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.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. Although the PIER 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 expenditures 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 Commission Project Manager 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 the 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 the appropriate information on each permit and an updated schedule to the Commission Project Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Project Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Project Manager 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

- A copy of each approved permit (if applicable)
- 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)

TECHNICAL TASKS

TASK 2: UPDATE PROJECT MANAGEMENT PLAN

The goal of this task is to update the DOE Project Management Plan (PMP) at the beginning of the project and as major changes in the project occur. The PMP is a detailed scope of work with emphasis on schedules, milestones, responsibilities, and expectations.

The Recipient shall:

- Update the DOE Project Management Plan.

Products:

- Updated DOE Project Management Plan

TASK 3: DEVELOP INTEROPERABILITY AND CYBER SECURITY PLAN

The goal of this task is to create a comprehensive Interoperability and Cyber Security Plan.

The Recipient shall:

- Develop a comprehensive Interoperability and Cyber Security Plan that fully describes interoperability and cyber security in every phase of the engineering lifecycle of the Wind Firming EnergyFarm™ project, including the following phases:
    - Design
    - Procurement
    - Construction
    - Installation
    - Commissioning; and
    - Ongoing maintenance and support.

Products:

- Interoperability and Cyber Security Plan

TASK 4: DEVELOP METRICS AND BENEFITS REPORTING PLAN

The goal of this task is to create a Metrics and Benefits Reporting Plan that establishes the baseline for evaluating project performance.

The Recipient shall:

- Develop a Metrics and Benefits Reporting Plan describing how metrics and benefits information will be developed, reported, and evaluated in order to assess the performance of demonstrated/deployed technology.
- Update the Plan subsequent to any major/significant project revisions.

Products:

- Metrics and Benefits Reporting Plan

TASK 5: DETAILED REQUIREMENTS SPECIFICATION

The goal of this task is to create detailed EnergyPod™ requirements and specifications.

The Recipient shall:

- Develop detailed specifications for the EnergyPod™ based on requirements from the project partners, and include the specification report in the Monthly Project Report.

Products:

- EnergyPod™ specifications

TASK 6: ENERGYCELL™ DESIGN (CEC-funded task)

The goal of this task is to design and build a functional 20 kilowatt (kW) energy cell.

The Recipient shall:

- Validate the energy cell design concept.
- Validate the stability of materials and production processes.
- Design Alpha EnergyCells.
- Build Alpha EnergyCells.
- Conduct in-house performance characterization.
- Provide EnergyCell performance optimization.
- Finalize EnergyCell production specifications.
- Design and build production EnergyCells.
- Develop the pilot production process for EnergyCells.
- Conduct in-house testing of production EnergyCells.
- Prepare a Monthly Progress Report in accordance with Task 1.4.

- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report

TASK 7: ENERGYPOD™ DESIGN ~~INTEGRATION AND VALIDATION~~

The goal of this task is to integrate and validate the EnergyPod™ model.

The Recipient shall:

- Develop the design specifications for the EnergyPod ™.
- Purpose-build an EnergyPod™ containing one string of EnergyCells, power electronics, switchgear, thermal management, and an auto-scrubber for independent laboratory testing.
- Install and commission the EnergyPod™.
- Test the EnergyPod™ at an independent test facility.
- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report

TASK 8 ~~11~~: SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM DESIGN ~~AND INSTALL ENERGYFARM™ DATA ACQUISITION SYSTEM~~

The goal of this task is to design and install the EnergyFarm™ Data Acquisition System (DAS).

The Recipient shall:

- Establish field test protocols with the MID.
- Design and deploy the data acquisition system.
- Calibrate the data acquisition system.
- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project status Report
- Quarterly DOE Metrics Report

TASK 9 ~~8~~: SELL ENERGYFARM™ ~~PERFORMANCE REVIEW~~

The goal of this task is to conduct an in-depth and full scale performance review.

The Recipient shall:

- Conduct a detailed performance analysis and summarize test results with appropriate charts, graphs, photos and other documentation.
- Facilitate a project review meeting with all project partners.
- Prepare a written Performance Report capturing test results and the project review meeting discussion.
- Attend a CPR meeting as per Task 1.2.

Products:

- Draft Performance Report
- Final Performance Report

TASK 10 ~~9~~: MANUFACTURING ~~DESIGN AND BUILD ENERGYPOD™ PRODUCTION FACILITY~~ (CEC-funded task)

The goal of this task is to design and build EnergyPod™ production facilities.

The Recipient shall:

- Optimize the pilot production process for mass production, including extensive quality assurance and control processes.
- Freeze the EnergyPod™ design and validate the production processes.
- Finalize the component supply chain.
- Determine the location of the EnergyPod™ production facility.
- Purchase and procure all manufacturing equipment.
- Build-out the production facility, including tenant improvements.
- Receive, install, start-up, and test all manufacturing equipment.
- Develop safety and quality assurance and control programs.
- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report

TASK 11 ~~10~~: ENERGYFARM™ BUILD ~~ENERGYPODs™~~

The goal of this task is to design and build approximately 42 EnergyPods™.

The Recipient shall:

- Hire a workforce and ramp production.
- Build initial EnergyPods™.
- Test initial EnergyPods™ as appropriate to ensure final field readiness.
- Deliver the initial EnergyPods™ to the Modesto Irrigation District (MID), a utility partner.
- Build remaining EnergyPods™.
- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report

~~TASK 11: DESIGN AND INSTALL ENERGYFARM™ DATA ACQUISITION SYSTEM~~

~~The goal of this task is to design and install the EnergyFarm™ Data Acquisition System (DAS).~~

~~The Recipient shall:~~

- ~~Establish field test protocols with the MID.~~
- ~~Design and deploy the data acquisition system.~~
- ~~Calibrate the data acquisition system.~~
- ~~Prepare a Monthly Progress Report in accordance with Task 1.4.~~
- ~~Prepare a Quarterly Metrics Report in accordance with DOE requirements.~~

~~Products:~~

- ~~Monthly Project status Report~~
- ~~Quarterly DOE Metrics Report~~

TASK 12: ENERGYFARM™ DEPLOYMENT ~~UTILITY PARTNER ENERGYFARM™~~

The goal of this task is to **commission and initiate the Data Acquisition System on the EnergyFarm and** deploy the utility partner model.

The Recipient shall:

- **Verify and calibrate the data acquisition system and execute commissioning tests.**
- Develop commissioning test protocols with the MID.
- Prepare the deployment site, including conducting NEPA review for the MID site, preparing a road base for EnergyFarm™, installing appropriate grid integration electrical hardware, and installing appropriate security measures.
- Deploy and integrate the EnergyFarm™.
- Conduct testing for paralleling and commissioning.

- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report

~~**TASK 13: COMMISSION ENERGYFARM™ AND INITIATE DATA ACQUISITION SYSTEM**~~

~~The goal of this task is to commission and initiate the Data Acquisition System on the EnergyFarm.~~

~~**The Recipient shall:**~~

- ~~Verify and calibrate the data acquisition system and execute commissioning tests.~~
- ~~Prepare a Monthly Progress Report in accordance with Task 1.4.~~
- ~~Prepare a Quarterly Metrics Report in accordance with DOE requirements.~~

~~**Products:**~~

- ~~Monthly Project Report~~
- ~~Quarterly DOE Metrics Report~~

TASK 13 ~~14~~: ACCUMULATE 24 MONTHS OF OPERATIONAL DATA

The goal of this task is to accumulate 24 months of operational data.

The Recipient shall:

- Operate and maintain the EnergyFarm™.
- Collect operational and maintenance data using the data acquisition system.
- Hold quarterly EnergyFarm™ performance reviews.
- Prepare Technology Performance Reports that summarize quarterly performance reviews.
- Attend a CPR meeting in accordance with Task 1.2.
- Prepare a Monthly Progress Report in accordance with Task 1.4.
- Prepare a Quarterly Metrics Report in accordance with DOE requirements.

Products:

- Monthly Project Report
- Quarterly DOE Metrics Report
- Technology Performance Reports

TASK 14 ~~15~~: 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.

The Recipient shall:

- Prepare a Technology Transfer Plan. The plan shall explain how the knowledge gained in this project will be made available to the public, such as participation in briefings and/or presenting the project results at appropriate technical conferences or meetings as specified by the DOE and Energy Commission Project Officer. 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.
- Conduct technology transfer activities in accordance with the Technology Transfer Plan. These activities shall be reported in the Progress Reports.

Products:

- Draft Technology Transfer Plan
- Final Technology Transfer Plan

Schedule of Products and Due Dates

Task Number	*Task Name*	*Product(s)*	*Original Planned Start Date*	*Revised Planned Start Date Amd. #1*	*Original Due Date*	*Revised Due Date Amd. #1*
1.1	**Attend Kick-off Meeting**					
		Updated Schedule of Products	7/1/2011		7/15/2011	
		Updated List of Match Funds	7/1/2011		7/15/2011	
		Updated List of Permits	7/1/2011		7/15/2011	
		Kick-Off Meeting Agenda (CEC)	7/1/2011		7/15/2011	
1.2	**Critical Project Review Meetings**					
	1st CPR Meeting	CPR Report	~~1/2/2012~~	**1/1/2013**	~~3/30/2012~~	**3/29/2013**
		DOE correspondence and reporting	~~1/2/2012~~	**1/1/2013**	~~3/30/2012~~	**3/29/2013**
		Performance Review Meeting	~~1/2/2012~~	**1/1/2013**	~~3/30/2012~~	**3/29/2013**
		Agenda and a list of expected participants (CEC)	~~12/1/2011~~	**12/3/2012**	~~12/15/2011~~	**12/14/2012**
		Schedule for written determination (CEC)	~~12/1/2011~~	**12/3/2012**	~~12/15/2011~~	**12/14/2012**
		Written determination (CEC)	~~4/2/2012~~	**4/1/2013**	~~4/10/2012~~	**4/12/2013**
	2nd CPR Meeting	CPR Report	~~7/2/2013~~	**7/1/2014**	~~8/30/2013~~	**8/29/2014**
		DOE correspondence and reporting	~~7/2/2013~~	**7/1/2014**	~~8/30/2013~~	**8/29/2014**
		Performance Review Meeting	~~7/2/2013~~	**7/1/2014**	~~8/30/2013~~	**8/29/2014**
		Agenda and a list of expected participants (CEC)	~~6/17/2013~~	**6/16/2014**	~~6/25/2013~~	**6/20/2014**
		Schedule for written determination (CEC)	~~6/17/2013~~	**6/16/2014**	~~6/25/2013~~	**6/20/2014**
		Written determination (CEC)	~~9/2/2013~~	**9/1/2014**	~~9/16/2013~~	**9/15/2014**
1.3	**Final Meeting**					
		Written documentation of meeting agreements	1/12/2015		1/23/2015	
		Schedule for completing closeout activities	1/30/2015		2/10/2015	
		DOE correspondence on project findings and results	~~11/10/2014~~	**8/1/2016***	~~3/27/2015~~	**12/1/2016***
1.4	**Monthly Progress Reports**					
		Monthly Progress Reports	Upon full execution of agreement		Progress Reports to match DOE reporting schedule	
		Copies of DOE reporting and meeting summaries	As needed		As needed	
1.5	**Final Report**					
		Draft Final Report, including a copy of the draft report submitted to DOE	~~1/5/2015~~	**1/5/2015***	~~2/6/2015~~	**2/6/2015***
		Final Report, including a copy of the final report submitted to DOE	~~2/9/2015~~	**2/9/2015***	~~3/13/2015~~	**3/13/2015***
		Written correspondence from DOE regarding acceptance of final report	~~3/16/2015~~	**10/14/2016***	~~3/25/2015~~	**12/1/2016***
1.6	**Identify and Obtain Match Funds**					
		A letter regarding match funds	7/1/2011		7/15/2011	
		Copy(ies) of each match fund commitment letter(s) (if applicable)	N/A		N/A	
		Letter(s) for new match funds (if applicable)	N/A		Within 10 days of identifying new match funds	
		Letter that match funds were reduced (if applicable)	N/A		Within 10 days of identifying new match funds	

1.7	**Identify and Obtain Required Permits**				
	Letter documenting the permits or stating that no permits are required	Complete		Complete	
	A copy of each approved permit (if applicable)	N/A		Within 10 days of receiving each permit	
	Updated list of permits as they change during the term of the Agreement (if applicable)	N/A		Within 10 days of change in list of permits	
	Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)	N/A		Within 10 days of change in schedule for obtaining permits	
2	**Update Project Management Plan**				
	Updated DOE Statement of Project Objectives	7/1/2011		7/15/2011	
3	**Develop Interoperability and Cyber Security Plan**				
	Interoperability and Cyber Security Plan	7/1/2011		7/15/2011	
4	**Develop Metrics and Benefits Reporting Plan**				
	Metrics and Benefits Reporting Plan	7/1/2011		7/15/2011	
5	**Detailed Requirements Specification**				
	Requirements Specification	7/1/2011		7/15/2011	
6	**EnergyCell Design**				
	Monthly project status reports	7/1/2011		7/29/2011	
	Quarterly metrics report	7/1/2011		7/29/2011	
7	**EnergyPod™ Design ~~Integration and Validation~~**				
	Monthly project status reports	7/1/2011		4/30/2012	
	Quarterly metrics report	7/1/2011		4/30/2012	
8 ~~11~~	**Supervisory Control and Data Acquisition System Design~~and Install EnergyFarm Data Acq.System~~**				
	Monthly project status reports	4/2/2012		1/31/2013	
	Quarterly metrics report	4/2/2012		1/31/2013	
9 ~~8~~	**Sell EnergyFarm™ ~~Performance Review~~**				
	Draft Performance Report	~~1/2/2012~~	**12/2/2013**	~~2/17/2012~~	**12/16/2013**
	Final Performance Report	~~2/20/2012~~	**12/17/2013**	~~3/30/2012~~	**1/15/2013**
10 ~~9~~	**Manufacturing ~~Design and Build EnergyPod™ Production Facility~~**				
	Monthly project status reports	7/1/2011		4/30/2012	
	Quarterly metrics report	7/1/2011		4/30/2012	
11 ~~10~~	**EnergyFarm™ Build ~~EnergyPods™~~**				
	Monthly project status reports	~~10/3/2011~~	**12/13/2013**	~~1/31/2013~~	**1/15/2014**
	Quarterly metrics report	~~10/3/2011~~	**12/13/2013**	~~1/31/2013~~	**1/15/2014**
~~11~~	**~~Design and Install EnergyFarm Data Acq.System~~**				
	~~Monthly project status reports~~	~~4/2/2012~~		~~1/31/2013~~	
	~~Quarterly metrics report~~	~~4/2/2012~~		~~1/31/2013~~	
12	**EnergyFarm™ Deployment ~~Utility Partner EnergyFarm~~**				
	Monthly project status reports	~~4/2/2012~~	**5/3/2010**	~~4/30/2013~~	**6/15/2010**
	Quarterly metrics report	~~4/2/2012~~	**5/3/2010**	~~4/30/2013~~	**6/15/2010**
~~13~~	**~~Commission EnergyFarm & Initiate Data Acq. System~~**				
	~~Monthly project status reports~~	~~1/2/2013~~		~~4/30/2013~~	
	~~Quarterly metrics report~~	~~1/2/2013~~		~~4/30/2013~~	
13 ~~14~~	**Accumulate 24 Months of Operational Data**				
	Monthly project status reports	~~4/2/2013~~	**8/6/2014**	~~12/31/2014~~	**9/15/2014**
	Quarterly metrics report	~~4/1/2013~~	**8/6/2014**	~~1/30/2015~~	**9/15/2014**
	Technology Performance Reports	~~4/1/2013~~	**8/6/2014**	~~10/31/2014~~	**1/1/2015**

14 ~~15~~ Technology Transfer Activities				
Draft Technology Transfer Plan	~~7/1/2011~~	**8/1/2014**	~~9/30/2011~~	**9/1/2014**
Final Technology Transfer Plan	~~10/14/2011~~	**9/2/2014**	~~10/31/2011~~	**10/3/2014**