

## EXHIBIT A

### SCOPE OF WORK AND PROJECT TASK DESCRIPTIONS

This project shall be conducted in accordance with the Recipient's State Energy Program (SEP) Special Project grant application as submitted to and approved by the United States Department of Energy (DOE). In the event of a conflict between the terms of this grant agreement (including the incorporated documents) and the Recipient's grant application, this grant agreement shall be considered controlling.

#### **Problem Statement:**

Combined heat and power (CHP) is an important concept for improving energy efficiency by allowing for waste heat capture for productive purposes from electricity production. Based on distributed generation (DG) technologies including engines, turbines, microturbines, and fuel cells, CHP can provide energy services with overall efficiencies in the 60-80% range, and without the significant transmission and distribution losses that are inevitable with central station generation.

California has a strong recent interest in CHP in regard to meeting the goals of Assembly Bill 32 - the Global Warming Solutions Act (AB 32). Based on the levels of greenhouse gas emission reductions needed to meet the goals of AB 32, needs for an additional 4 GW of CHP in California by 2020 have been identified. This compares with approximately 9 GW of CHP at present, but with much of this at large industrial settings included for enhanced oil recovery in the California central valley. The tasks proposed here are intended to help to achieve the AB 32 scoping plan goals, but much additional efforts will be required as the current CHP market is developing slowly due to regulatory uncertainty about incentives and "feed in tariffs" among other factors.

Key planned PCEAC activities include an extensive website with information on CHP/district energy and links to other sites, organizing and hosting workshops and conferences targeted to CHP "end user" groups, conduct of facility energy audits and "level 2" CHP screenings, preparation of state assessment and policy reports, preparation of project profile case studies, responses to inquiries for information from potential end users and other parties, project management, and other miscellaneous activities.

The PRAC network will achieve this objective by targeted education and outreach as well as project assistance using the following strategies:

- Continue to extend PRAC network activities throughout CA, NV, and HI and work closely with existing organizations and companies in the region in order to facilitate the deployment of CHP;
- Provide outreach and education to potential CHP users;
- Identify regulatory and policy barriers and opportunities, and work with stakeholders to address obstacles to CHP deployment; and

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- Identify and facilitate high impact CHP projects -- projects that have the potential to be replicated, open up new markets, and have the potential for large market impact.

The specific tasks that the PRAC would undertake through this Agreement are outlined in the work scope below.

### **Goals of the Agreement:**

The goal of this Agreement is to advance the state of knowledge and conduct directed outreach and CHP field performance and implementation status assessment activities related to further deployment of CHP in California.

### **Objectives of the Agreement:**

The objectives of this Agreement are to carry forward the activities of the PRAC network for an additional period in Nevada and Hawaii as well as within California. The PRAC network proposes several new and continued tasks to help the Pacific Region adopt and realize further deployment of CHP systems. It will provide essential outreach and research support to enhance technology transfer and deployment of advanced CHP technologies.

### **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

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- 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 (no draft)
- Updated List of Match Funds (no draft)
- Updated List of Permits (no draft)

### **Commission Project Manager Product:**

- Kick-Off Meeting Agenda (no draft)

### **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 if necessary, the budget will be reallocated to cover the additional costs borne by the Recipient, but the overall grant amount will not increase.

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.

### **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

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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.

### **Commission Project Manager Products:**

- Agenda and a list of expected participants (no draft)
- Schedule for written determination (no draft)
- Written determination (no draft)

### **Recipient Product:**

- CPR Report(s) (no draft)

### **Task 1.3 Final Meeting**

The goal of this task is to closeout this Agreement.

### **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.

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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
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement

### **Products:**

- Written documentation of meeting agreements (no draft)
- Schedule for completing closeout activities (no draft)

### **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 which 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 Commission Project Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Exhibit A, Attachment A-2.

### **Product:**

- Monthly Progress Reports (no draft)

### **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 RD&D projects and improvements to the PIER project management processes.

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:**

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the approved outline and the latest version of the PIER Final Report guidelines published on the Energy Commission's website at <http://www.energy.ca.gov/contracts/pier/contractors/index.html> at the time the Recipient begins performing this task, unless otherwise instructed in writing by the Commission Project Manager. Instead of the timeframe listed in the Product Guidelines located in Section 5 of the Terms and Conditions, the Commission Project Manager shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed on or 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 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:**

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- 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. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state such in the letter. If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter a list of the match funds that identifies the:
  - Amount of 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 or stating that no match funds are provided (no draft)
- Copy(ies) of each match fund commitment letter(s) (if applicable) (no draft)
- Letter(s) for new match funds (if applicable) (no draft)
- Letter that match funds were reduced (if applicable) (no draft)

### **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 reimbursable under this Agreement. Permits must be identified in writing before the Recipient can incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

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### **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 10 days. Either of these events may trigger an additional CPR.

### **Products:**

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

### **TASK 1 TARGETED MARKET WORKSHOP**

The goal of this task is to The PRAC shall conduct an additional targeted CHP market workshop in 2011, beyond those already planned with other (U.S. DOE) funding. The topic will be determined from an updated CHP Roadmap for the Pacific Region. The funds will be used to support the meeting logistics and to also offset registration fees for end users to maximize the turnout of end users in the sector and to help produce action oriented material summarizing the workshop findings and promote follow up for site assessments. This effort will be led by UCI with support from UCB and SDSU.

### **The Recipient shall:**

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- Plan a target market CHP workshop in the Pacific region
- Advertise and promote the CHP workshop
- Execute the CHP workshop
- Develop summary target market workshop report

### **Products and Due Dates:**

- Targeted workshop summary report  
Product due date: July 31, 2011

### **TASK 2 TARGETED MARKET PARTICIPATION**

This task would support a presence of PRAC at key CHP oriented conferences (e.g., PowerGen 2011 and CADER). The field of renewable energy and fuels are strongly intertwined with power generation and CHP, especially in the biomass arena. The Power-Gen conference is the premier event in the renewables sector and the draw of Las Vegas provides for large attendance expectations. An introduction to the renewables community from around the world would have benefit not only for the PRAC but for all RACs owing to the wide geographic draw. While the renewables aspect suggests primarily solar, wind, and hydro, nearly 50% of the attendees at PowerGen are typically associated with other forms of renewables and of those nearly all were associated with power generation, heat, or both. This show would seem to be a good fit for PRAC with close proximity to the California centers.

### **The Recipient shall:**

- Develop education and outreach materials in advance of conference(s)
- Participate in conferences with posters, booth space, and podium presentations (to the extent possible)
- Follow-up based on contacts made at the workshop and subsequent enquiries

### **Products and Due Dates:**

- Conference materials (no draft)  
Product due date: August 31, 2011

### **TASK 3 CHP SYSTEM FIELD OPERATIONAL PERFORMANCE ASSESSMENT**

The goal of the task is to gain a better understanding of the actual "real world" performance of CHP systems in the Pacific Region and reliability of existing systems, and to compare actual performance to projected performance. Performance metrics would be gathered with regard to electrical and overall thermal operating efficiency, operating "duty cycle" patterns, maintenance needs and downtime/availability, and other relevant performance related issues impacting implementation of CHP systems. The task would also examine the current status and short term potentials of the CHP market in the Pacific region and define a set of recommendations that may better target financial incentives as well as improve performance and implementation of CHP systems.

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To the extent possible, the assessments shall be conducted according to the ASERTTI Case Study Protocol. The protocol is intended to provide data on electrical, thermal, emissions, and operational performance of CHP systems based on data collected using the Long Term Monitoring Protocol as well as additional financial and qualitative information from the plant. If the site resources and project funding are not adequate to allow for use of the ASERTTI protocol, the incremental costs of doing so will be estimated (for potential future use) and efforts will be made instead to collect performance data based on long-term utility bills and interviews with plant personnel. SDSU will lead and UCI and UCB will assist in recruiting potential CHP sites willing to have this service.

### **The Recipient shall:**

- Perform field assessments of current CHP system performance
- Identify the potential and cost to equip sites with monitoring equipment that would allow assessment with the ASERTTI case study protocols
- Report on task findings

### **Products and Due Dates:**

- Field Assessment Report (no draft)  
Product due date: August 31, 2011

### **TASK 4 PROJECT SCREENING UPDATE IN TARGET MARKETS**

Under this task SDSU will revisit the CHP sites that have been screened for CHP installation in previous phases of the PRAC project, and generate an update report that explores and reports the current project status for each site. If any projects have moved forward, progress will be documented and if they have not, the reasons for this will be explored (e.g., expiration of most SGIP incentives, volatility in natural gas prices, etc.). The locations include those in all three of the PRAC states: California, Hawaii, and Nevada.

### **The Recipient shall:**

- Revisit previously screened sites and determine if CHP is still being considered (possibly delayed due to recent policy uncertainties) and if so what could be done or is needed to move projects forward
- Document findings in a brief report

### **Products and Due Dates:**

- Project screening update report (no draft)  
Product due date: August 31, 2011

### **TASK 5 PROJECT PROFILES FOR CHP TARGET MARKETS**

Under this task the PRAC will produce 4-5 additional project profile studies targeted at attractive applications and niches for CHP in the Pacific Region. These target markets include food processing facilities, hotels/casinos, wineries and breweries, swimming pool heating applications, and high-tech industry. This task would bring the total to project profiles conducted

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by the PRAC to about 25, with 10 now completed and 8-10 additional ones being prepared under existing funding. These various studies throughout California, Nevada, and Hawaii would be available individually on the PRAC (and MAC) website and also would be bound together in a revised “Pacific Region CHP Applications Handbook” that covers a wide range of applications and settings.

### **The Recipient shall:**

- Conduct site visits and other data gathering activities on 4-5 additional CHP sites
- Prepare project profiles (two-page) for the 4-5 sites, including key information, site pictures, etc.
- Upload the profiles to the project website and provide to the U.S. DOE central site

### **Products and Due Dates:**

- 4-5 completed CHP project profiles  
Product due date: August 31, 2011

## **TASK 6 REVISED STATE BASELINE AND ACTION PLAN REPORTS**

Under this task, the PRAC will perform revisions and additions to the individual state baseline assessment/action plan reports for California, Hawaii, and Nevada. The revisions would include:

- updating the reports with the latest developments on interconnection, utility rate, and incentive policies;
- updating the “CHP landscape” sections including installed systems base, general conditions for CHP in each state, etc.;
- adding additional report sections to briefly summarize the operating principles and commercial availability of key CHP system technologies;
- expanding and revising the appendices of CHP industry contacts for the Pacific region; and
- soliciting additional comments on the reports from CHP stakeholders in the Pacific region.

The revised reports will be made available through the PRAC website and also through the state energy offices. An additional component of this task is to make the state baseline assessments responsive to requests from project sponsors for key performance metrics, such as recently installed CHP projects, estimates of energy and greenhouse gas emissions reductions from CHP system operations, etc.

### **The Recipient shall:**

- Gather data and information needed to update the three state reports
- Perform updates to the reports
- Release draft reports for review by stakeholders and the PRAC advisory board
- Release the revised reports through the PRAC website

### **Products and Due Dates:**

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- State Baseline Assessment/Action Plan Reports (no draft report) (three)  
Product due date: August 31, 2011