

Exhibit A
SCOPE OF WORK
*Energy, Air Quality, Water and Climate Change Co-Benefits of
Renewable Power Generation and Fuels Roadmap*

TECHNICAL TASK LIST

Task #	CPR	Task Name
1	N/A	Administration
2		Alternative Energy and Fuel Technology Identification Analyses
3		Energy, Air Quality, Water and Climate Change Co-benefits Analyses
4		Roadmap Development

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1			
2	Scott Samuelsen, Jack Brouwer		
3	Scott Samuelsen, Jack Brouwer		
4	Scott Samuelsen, Jack Brouwer		

GLOSSARY

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

Acronym	Definition
CPR	Critical Project Review
Energy Commission	California Energy Commission
EA	Environmental Area
GHG	Greenhouse Gases
PIER	Public Interest Energy Research
UCC.1	Uniform Commercial Code (Financing Statement)

Problem Statement

The variability of fuel cost and supply in California, coupled with the state's focus on energy conservation, reduction of greenhouse gases (GHG), and the Governor's

expanded goal of 33% renewable energy by 2020, will result in large increases in the use of renewable generation and fuels throughout the state. Some of these alternative energy sources may be beneficial to air quality, some may not. Many times, however, emissions from the delivery pathway and from their use are not as well understood as for conventional fuels. There can be unforeseen drawbacks and benefits of switching fuels. There may be additional impacts and benefits from these fuel sources beyond air quality effects, such as reducing GHG emissions or conserving freshwater supplies. Since these impacts and co-benefits are not well understood, there is a need for additional research to inform decision makers of the consequences of these energy sources. To guide these research efforts, a roadmap that identifies knowledge gaps and research needs is needed. This specific focus is important to guide Public Interest Energy Research (PIER) Environmental Area (EA) research to help bring these resources to California in an environmentally sound way.

Goals of the Agreement

The goal of this agreement is to develop a roadmap identifying the state of knowledge, research gaps, and recommended research pathways to quantify the air quality benefits/disbenefits of renewable generation and of alternative fuels and the energy and environmental co-benefits of using these resources in California. This roadmap will complement the existing PIER-EA air quality suite of roadmaps on distributed generation, indoor air quality, energy efficiency and environmental justice. The roadmap will be designed to identify relevant research gaps and questions. Workshops will be held that will gather information for developing the roadmap, vet roadmap recommendations, and disseminate the conclusions of the roadmap.

Objectives of the Agreement

Three objectives have been established to meet the goals of this agreement as follows:

- Conduct research and host a workshop to identify the proven and/or expected performance of alternative energy and fuel technologies,
- Conduct research and host a workshop to identify methods to analyze energy, environmental and climate change co-benefits, and
- Develop a roadmap that identifies the state of knowledge, research gaps, and recommended research pathways to evaluate potential air quality impacts and energy, climate change and water co-benefits of the use of traditional, alternative and renewable fuels in California.

TASK 1.0 ADMINISTRATION

MEETINGS

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 Contractor shall:

- Attend a “kick-off” meeting with the Commission Contract Manager, the Contracts Officer, and a representative of the Accounting Office. The Contractor shall bring their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the Commission Contract 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 Contract 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:

- Terms and conditions of the Agreement
- CPRs (Task 1.2)
- Match fund documentation (Task 1.7)
- Permit documentation (Task 1.8)

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

- The Commission Contract Manager’s expectations for accomplishing tasks described in the Scope of Work;
- An updated Schedule of Deliverables
- Progress Reports (Task 1.4)
- Technical Deliverables (Task 1.5)
- Final Report (Task 1.6)

The Commission Contract Manager shall designate the date and location of this meeting.

Contractor Deliverables:

- An Updated Schedule of Deliverables
- An Updated List of Match Funds
- An Updated List of Permits

Commission Contract Manager Deliverables:

- Final Report Instructions

Task 1.2 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 if it should, are there any modifications that need to be made to the tasks, deliverables, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Contractor. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Contract Manager and as shown in the Technical Task List above and in the Schedule of Deliverables. However, the Commission Contract Manager may schedule additional CPRs as necessary, and, if necessary, the budget will be reallocated to cover the additional costs borne by the Contractor, but the overall contract amount will not increase.

Participants include the Commission Contract Manager and the Contractor, and may include the Commission Contracts Officer, the PIER Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Contract Manager to provide support to the Energy Commission.

The Commission Contract Manager shall:

- Determine the location, date and time of each CPR meeting with the Contractor. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Contractor 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 to modify the tasks, schedule, deliverables and budget for the remainder of the Agreement, including not proceeding with one or more tasks. If the Commission Contract Manager concludes that the project needs a formal amendment or that satisfactory progress is not being made and the project needs to be ended, these conclusions will be referred to the Commission's Research, Development and Demonstration Policy Committee for its concurrence.
- Provide the Contractor with a written determination in accordance with the schedule. The written response may include a requirement for the Contractor to revise one or more deliverable(s) that were included in the CPR.

The Contractor 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 deliverables identified in this Scope of Work. Submit these documents to the Commission Contract 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.

Contractor Deliverables:

- CPR Report(s)
- CPR deliverables identified in the Scope of Work

Commission Contract Manager Deliverables:

- Agenda and a List of Expected Participants
- Schedule for Written Determination
- Written Determination

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Contractor shall:

- Meet with the Energy Commission 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 Contractor, the Commission Contracts Officer, and the Commission Contract 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 Contract Manager.

The technical portion of the meeting shall present findings, conclusions, and recommended next steps (if any) for the Agreement. The Commission Contract Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Contract Manager and the Contracts Officer about the following Agreement closeout items:

- What to do with any state-owned equipment (Options)
- Need to file UCC.1 form re: Energy Commission's interest in patented technology
- Energy Commission's request for specific "generated" data (not already provided in Agreement deliverables)
- Need to document Contractor's disclosure of "subject inventions" developed

- under the Agreement
 - “Surviving” Agreement provisions, such as repayment provisions and confidential deliverables
 - Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Deliverables:

- Written documentation of meeting agreements and all pertinent information
- Schedule for completing closeout activities

REPORTING

See Exhibit D, Reports/Deliverables/Records.

Task 1.4 Quarterly 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.

The Contractor shall:

- Prepare progress reports which summarize all Agreement activities conducted by the Contractor 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 Contract Manager within 10 working days after the end of the reporting period. Attachment A-2, Progress Report Format, provides the recommended specifications.

Deliverables:

- Quarterly Progress Reports

Task 1.5 Test Plans, Technical Reports and Interim Deliverables

The goal of this task is to set forth the general requirements for submitting test plans, technical reports and other interim deliverables, unless described differently in the Technical Tasks. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

<http://www.energy.ca.gov/contracts/pier/contractors/index.html>

The Contractor shall:

- Unless otherwise directed in this Scope of Work, submit a draft of each deliverable listed in the Technical Tasks to the Commission Contract Manager for review and comment in accordance with the approved Schedule of Deliverables. The

Commission Contract Manager will provide written comments back to the Contractor on the draft deliverable within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final deliverable to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final deliverable within 5 working days of receipt. Key elements from this deliverable shall be included in the Final Report for this project.

Task 1.6 Final Report

The goal of this task is to prepare a comprehensive written Final Report that describes the original purpose, approach, results and conclusions of the work done under this Agreement. The Commission Contract Manager will review and approve the Final Report. The Final Report must be completed on or before the termination date of the Agreement. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

<http://www.energy.ca.gov/contracts/pier/contractors/index.html>

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

Task 1.6.1 Final Report Outline

The Contractor shall:

- Prepare a draft outline of the Final Report.
- Submit the draft outline of Final Report to the Commission Contract Manager for review and approval. The Commission Contract Manager will provide written comments back to the Contractor on the draft outline within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final outline to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final outline within 5 working days of receipt.

Deliverables:

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

Task 1.6.2 Final Report

The Contractor shall:

- Prepare the draft Final Report for this Agreement in accordance with the approved

outline.

- Submit the draft Final Report to the Commission Contract Manager for review and comment. The Commission Contract Manager will provide written comments within 10 working days of receipt.

Once agreement on the draft Final Report has been reached, the Commission Contract Manager shall forward the electronic version of this report for Energy Commission internal approval. Once the approval is given, the Commission Contract Manager shall provide written approval to the Contractor within 5 working days.

- Submit one bound copy of the Final Report with the final invoice.

Deliverables:

- Draft Final Report
- Final Report

MATCH FUNDS, PERMITS, AND ELECTRONIC FILE FORMAT

Task 1.7 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. While the PIER budget for this task will be zero dollars, the Contractor may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds during the term of this Agreement. Match funds must be identified in writing, and the associated commitments obtained before the Contractor can incur any costs for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
 1. 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.
 2. 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 Contractor shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
- 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 significantly 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 Contract Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Contract Manager within 10 working days if during the course of the Agreement existing match funds are reduced. Reduction in match funds may trigger an additional CPR.

Deliverables:

- A letter regarding Match Funds or stating that no Match Funds are provided
- Letter(s) for New Match Funds
- A copy of each Match Fund commitment letter
- Letter that Match Funds were Reduced (if applicable)

Task 1.8 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 Contractor can incur any costs related to the use of the permit(s) for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
 1. If there are no permits required at the start of this Agreement, then state such in the letter.
 2. 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
 - Schedule the Contractor will follow in applying for and obtaining these permits.
- The list of permits and the schedule for obtaining them will be discussed at the kick-off meeting, and a timetable for submitting the updated list, schedule and the copies of the permits will be developed. 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, then provide the appropriate information on each permit and an updated schedule to the Commission Contract Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Contract Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Contract Manager within 5 working days. Either of these events may trigger an additional CPR.

Deliverables:

- A letter documenting the Permits or stating that no Permits are required
- Updated list of Permits as they change during the Term of the Agreement
- Updated schedule for acquiring Permits as it changes during the Term of the Agreement
- A copy of each approved Permit

Task 1.9 Electronic File Format

The goal of this task is to unify the formats of electronic data and documents provided to the Energy Commission as contract deliverables. Another goal is to establish the computer platforms, operating systems and software that will be required to review and approve all software deliverables.

The Contractor shall:

- Deliver documents to the Commission Contract Manager in the following formats:
 - Data sets shall be in Microsoft (MS) Access or MS Excel file format.
 - PC-based text documents shall be in MS Word file format.
 - Documents intended for public distribution shall be in PDF file format, with the native file format provided as well.
 - Project management documents shall be in MS Project file format.
- Request exemptions to the electronic file format in writing at least 90 days before the deliverable is submitted.

Deliverables:

- A letter requesting exemption from the Electronic File Format (if applicable)

TECHNICAL TASKS

The Contractor shall prepare all deliverables in accordance with the requirements in Task 1.5. Deliverables not requiring a draft version are indicated by marking “(no draft)” after the deliverable name.

Task 2 Alternative Energy and Fuel Technology Identification and Analyses

The goal of this task is to identify relevant alternative energy and alternative fuels technologies and pathways to identify the state of knowledge and research gaps that need to be addressed to bring these technologies to market in an environmentally sound way. The analysis will include all aspects of bringing these technologies to the market, including siting facilities, life cycle and implementation.

The Contractor shall:

- Identify, review and assess relevant alternative energy and alternative fuel developments, status reports, technology assessments and articles.
- Develop a Technology Assessment Report to help determine the scope of the roadmap in terms of technologies and pathways. The report will provide relevant insights, research findings, and background information on programs and projects underway throughout the world on these alternative energy and fuel technologies.
- Plan for and host a workshop with invitations to a broad array of stakeholders. Workshop participants will discuss and critique the initial scope of the roadmap and research gaps identified.
- Prepare a summary of the workshop, including issues and concerns raised by the participants.
- Use web-based survey tools to create a web-based survey that allows community critique and analyses of the technologies and research gaps identified.
- Modify the Technology Assessment Report on the basis of workshop and web survey input.

Deliverables:

- Technology Assessment Report
- Web-based survey
- Workshop summary (no draft)

Task 3 Energy, Air Quality, Water and Climate Change Co-benefits Analyses

The goal of this task is to identify situations where there is a requirement to determine co-benefits under AB 32 or an opportunity to highlight co-benefits, current methods used to determine energy, air quality, water and climate change co-benefits, and research gaps and needs in order to develop new methods to determine co-benefits.

The Contractor shall:

- Identify, review and assess relevant California and federal legislation and literature on methods used to evaluate co-benefits, shortcomings of current methods and proposed improvements.
- Develop a Co-benefits Methodology Assessment Report that addresses the shortcomings and gaps in determining co-benefits, and provides relevant insights, research findings, and background information on programs and projects underway throughout the world.
- Include in the Task 2 workshop a presentation and discussion on requirements to consider co-benefits, current methods used, shortcomings and proposed improvements.
- Modify the Co-benefits Methodology Assessment Report on the basis of workshop input.

Deliverables:

- Co-benefits Methodology Assessment Report

Task 4 Roadmap Development

The goal of this task is to integrate the findings of the previous tasks and develop a roadmap identifying the state of knowledge, research gaps, and recommended research pathways to quantify the air quality benefits/disbenefits of renewable power generation and of alternative fuels and the energy and environmental co-benefits of using these resources in California.

The Contractor shall:

- Identify barriers and research gaps to adoption of selected technologies in an environmentally sound way.
- Develop a roadmap that overlays scientific and technology hurdles, milestones, and Research Development and Demonstration projects and advances in science and technology - in the near-, mid- and long-term - to show how California actions can hasten the acceptance of alternative energy and fuels technologies that can provide the co-benefits of improved air quality and reduced GHG emissions.
- Plan for and host a workshop with invitations to a broad array of stakeholders to obtain comments and suggestions on the Draft Roadmap from stakeholders.
- Prepare a summary of the workshop, including issues and concerns raised by the participants.
- Incorporate stakeholder comments into the roadmap as appropriate.
- Work with the Energy Commission Contract Manager to disseminate the findings through appropriate and approved presentations, publications, and/or web-site postings.

Deliverables:

- Roadmap
- Workshop summary (no draft)