

**Exhibit A
SCOPE OF WORK**

Visualizing Climate Change Risk and Adaptation Options for California: CalAdapt

TECHNICAL TASK LIST

Task #	CPR	Task Name
1	N/A	Administration
2	X	Project operational protocol development and update
3		Operationalization of CalAdapt
4		Outreach for CalAdapt

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1-4	UC Berkeley/Kevin Koy UC Berkeley/Maggi Kelly		

GLOSSARY

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

Acronym	Definition
CCM	Energy Commission Contract Manager
CPR	Critical Project Review
Energy Commission	California Energy Commission
Media Office	Energy Commission's Media and Public Communications
PIER	Public Interest Energy Research
Strategy	California Climate Adaptation Strategy
UCC.1	Uniform Commercial Code (Financing Statement)

Problem Statement

One of the major challenges facing the members of the climate change adaptation community is the paucity of tools and established methodologies to convey the nature of the risk posed by climate change to a wider audience. There is a serious bottleneck in delivering relevant information, much of which is spatial in nature, to decision makers in a manner that allows them to turn climate change research results into effective climate change adaptation decisions and policies.

On December 2, 2009 the Governor released a comprehensive California Climate Adaptation Strategy (Strategy) and unveiled the prototype CalAdapt website (<http://www.climatechange.ca.gov/visualization/index.html>) that was developed under funding and technical direction from California Energy Commission's Public Interest Energy Research (PIER) and Google.org. CalAdapt is a web-based interactive visualization tool that can convey the risks of climate change for the benefit of Californians who live in the affected communities and local decision makers. The Strategy mandates the California Energy Commission (Energy Commission) to fully develop CalAdapt by September 2010 and thereafter regularly update the site. The Strategy further mandates the Energy Commission to conduct a climate change Vulnerability Study.

Goals of the Agreement

The goal of this Agreement is to fulfill the mandate of expanding and further developing the prototype CalAdapt website into a fully operational interactive site by the end of September 2010, as specified in the 2009 Climate Adaptation Strategy.

This project complies with Section 25620 (b) of the Public Resources Code by supporting research endeavors "that are not adequately provided for by competitive and regulated energy markets."

The energy sector is the main source of greenhouse gas emissions in California and, therefore, must contribute to the identification of potential climate change impacts and the development of coping and adaptation strategies. In addition, climate change will substantially affect energy generation and demand which requires tracking how climate is changing and estimating how it may evolve in the rest of this century.

Furthermore, Governor's Executive Order S-03-05 mandates the Energy Commission to engage in climate change research and provide scientific information to the Climate Change Action team's biennial climate change impacts assessment reports to the Governor and the State Legislature. Finally, Executive Order S-13-08 and the recently adopted California Climate Adaptation Strategy orders the Energy Commission to continue supporting climate change research to provide the scientific basis for the development of adaptation strategies for California and to continue the development of the CalAdapt website which should be ready for a formal release in September 2010.

Objectives of the Agreement

The objective of this Agreement is to: 1) further develop the CalAdapt prototype website into a fully functional interactive climate change risk assessment tool; 2) provide climate change data and information to local, regional, and state level entities via the CalAdapt website to inform their planning processes, and 3) educate people in California about the potential impacts of climate change and adaptation options.

The CalAdapt site will offer three levels of access to accommodate different levels of technical knowledge and user purposes. The first level will be for educational, for general public and policy makers with very little or no knowledge of climate change who are visiting the site to learn about the affects of climate change at their home town or other loci of interest. The primary users of the second level will be technical staff and resource managers who require a more sophisticated level of information and data that they could use for their work. For practical purposes, the amount of data available in level 2 would be what can be accommodated with normal Internet traffic. The bulk of the CalAdapt website will be dedicated to this second level. The third level will be mostly links for large data sets available outside of the CalAdapt website. This level will be designed mostly for researchers, scientists, and technical staff. All three access levels in CalAdapt will be open to public. However, the groups in charge of the sites listed and described in level 3 will retain the authority with respect to access to their sites.

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
- An updated Gantt Chart (optional)
- 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 PROJECT OPERATIONAL PROTOCOL DEVELOPMENT AND UPDATE

Given the urgency to start working on the CalAdapt website, a Work Authorization has been initiated (BOA-99-252) with the same Contractor to allow the development of an operational protocol. Task 2 under this agreement will finish the work that will not be accomplished under the Work Authorization due to expiration of the BOA or funds exhaustion. Also under this task, the protocol will be maintained up-to-date with new data sets and information that will be generated by on-going and planned PIER projects. The updates to the protocol will be submitted with the quarterly reports.

The goal of this task is to develop and update an operational protocol and implement it in subsequent tasks of this project. The Contractor will identify potential protocol updates and consult them with the Energy Commission Contract Manager (CCM), a representative from the Energy Commission's Media and Public Communications Office (Media Office), and a liaison from Google.org for implementation. The Contractor must obtain an explicit approval of the protocols and updates from the CCM.

The Contractor shall:

- Prepare, in consultation with the CCM, the Media Office, and Google.org, an operational protocol identifying the technical and procedural details to be followed for the entire project. The protocol shall contain the following elements:
 - A conceptual schematic of the CalAdapt website which clearly demonstrates how the three levels of access planned (see task 3) for the CalAdapt site would take place.
 - A plan for hosting and maintaining the CalAdapt website for the entire duration of this project using Contractor's own Internet and computer resources.
 - A clear strategy on how to enhance the "climate data in a grid" (<http://climatechange.ca.gov/visualization/grid.html>) tool to make data available at different grids and levels of temporal and geographical aggregation.
 - A list and description of potential Google Earth Applications or similar products that would be included in the website. The Contractor must work very closely with the PIER program and its scientists to determine the level of temporal and geographical aggregation that will be needed for the different data sets to ensure the scientific integrity of the message and data.
 - Sample webpages
- Submit the protocol to CCM. The CCM in consultation with the Media Office, and Google will provide comments, suggestions, and request modifications, if necessary. Upon receiving such comments, Contractor shall modify the protocol accordingly and resubmit until approved by the CCM.
- Submit updated protocols, as needed, in the quarterly reports.
- Participate in the Critical Review Meeting as per Task 1.2

Deliverables:

- Project Operation Protocol
- CPR Report

Task 3 OPERATIONALIZATION OF CalADAPT**Sub-task 3.1 OPERATIONALIZATION OF CalADAPT: PHASE I**

The goal of this sub-task is to expand the range of CalAdapt's data coverage and further develop the prototype tool into a fully operational interactive website by September 2010, as specified in the Strategy. Since there is little time between the start of this project and the formal release time, the Contractor is expected to concentrate as much labor hours as possible during this period to facilitate the formal release.

The Contractor shall:

- Concentrate all available manpower to this task, so as to facilitate the formal release of CalAdapt in September 2010 in all possible manners.
- Consult the Stockholm Environment Institute's Dr. David Purkey, who created the prototype CalAdapt website, for encryption methods of climatic data for Google Earth applications and embedding them on different scales of grids. The CCM will provide the final report from this work (Energy Commission Contract SAIC-06-035-P-R), which is currently under the Energy Commission's publications review.
- Work closely with CCM to encrypt available climatic data into the existing CalAdapt platform. The CCM will provide the data sources and Google engineers will provide technical advice. The data are mostly comprised of past and current PIER-funded studies. Other available data sources will be tapped into, if necessary, to complement the PIER data.
- Consult the researchers who generated the datasets in configuring the best temporal (hourly, weekly, monthly, yearly, decadal) and geographical resolutions to maximize the quality of the data and graphical display.
- Coordinate with research groups that are creating their own Google Earth sites to ascertain the uniformity of contents on both CalAdapt and their sites.
- Prepare a brief technical memorandum providing general guidance or protocol to the different groups providing data to facilitate the use of the data.
- Where applicable, create a link to specific PIER report covering the locale (e.g., reports dealing with impacts in the San Joaquin Valley would be listed and available when the cursor is hovering over this area of the state).
- Prepare webpages and obtain CCM approval prior to posting.
- Participate in in-person meetings and conference calls/WebEx meetings with researchers and CCM, Google, and Media Office, as necessary.
- Demonstrate the release-ready CalAdapt website at a presentation at the Energy Commission.

Deliverables:

- Technical memorandum: Data preparation guide (No draft)
- Screenshots of webpages of the CalAdapt Website
- PowerPoint file for pre-release demonstration (No draft)

Sub-task 3.2 OPERATIONALIZATION OF CalADAPT: PHASE II

The goal of this sub- task is to expand the range of CalAdapt’s data coverage and further develop the September version of the CalAdapt website. Periodic updates to the site will take place as new information and applications become available.

The Contractor Shall:

- Update the CalAdapt website continuously with new information and data as they become available as part of the PIER’s climate change research sub-program.
- Coordinate with research groups that are creating their own Google Earth sites to ascertain the uniformity of contents on both CalAdapt and their sites.
- Include in quarterly reports description of all updates to CalAdapt website.
- Prepare a brief technical report entitled “Operationalization of CalAdapt: Lessons Learned.” This memo will describe Contractor’s experiences with technology transfer issues germane to converting scientific data into an interactive visualization tool, especially during the process of operationalizing the CalAdapt website. This technical report will constitute the final report as required in task 1.6, and it follow the procedures of task 1.6.

Deliverables:

- Screenshots of updated webpages

Task 4 OUTREACH FOR CalADAPT

The goal of this task is to make the knowledge gained and lessons learned available to the scientific community, decision-makers, and interested public.

The Contractor shall:

- Present CalAdapt at the annual PIER Climate Change Conference held in Sacramento, California.
- Provide the CCM with project factsheet and any public relational write-ups on CalAdapt, as requested.

Deliverables:

- CalAdapt project factsheet
- PowerPoint file(s), other project-related informational materials, as requested by the CCM (No draft)