



**CONTRACT REQUEST FORM (CRF)**



**I) List all key partners:** (attach additional sheets as necessary)

Legal Company Name:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**J) Budget Information**

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
NG Subaccount, PIERDD	13-14	501.001H	\$300,000
			\$
			\$
			\$
			\$
			\$
R&D Program Area: EGRO: EA		TOTAL:	\$

Explanation for "Other" selection \_\_\_\_\_

Reimbursement Contract #: \_\_\_\_\_ Federal Agreement #: \_\_\_\_\_

K) Contractor's Administrator/ Officer				Contractor's Project Manager			
Name:	Wendi Hayes			Name:	Maggi Kelly		
Address:	2150 Shattuck Ave Ste 300 2150 Shattuck Ave., Suite 313			Address:	University of California, Berkeley 137 Mulford Hall #3114		
City, State, Zip:	Berkeley, CA 94704-5940			City, State, Zip:	Berkeley, CA 94720-3114		
Phone:	510-643-3391 /	Fax:	- -	Phone:	510-642-7272 /	Fax:	- -
E-Mail:	wendih@berkeley.edu			E-Mail:	mkelly@nature.berkeley.edu		

**L) Selection Process Used** (For amendments, address amendment exemption or NCB, do not identify solicitation type of original agreement. )

Solicitation Select Type Solicitation #: \_\_\_\_\_ # of Bids: \_\_\_\_\_ Low Bid?  No  Yes

Non Competitive Bid (Attach CEC 96)

Exempt Interagency

**M) Contractor Entity Type**

Private Company (including non-profits)

CA State Agency (including UC and CSU)

Government Entity (i.e. city, county, federal government, air/water/school district, joint power authorities, university from another state)

**N) Is Contractor a certified Small Business (SB), Micro Business (MB) or DVBE?**  No  Yes

If yes, check appropriate box:  SB  MB  DVBE

**O) Civil Service Considerations**

Not Applicable (Agreement is with a CA State Entity or a membership/co-sponsorship)

Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER)

The Services Contracted:

- are not available within civil service
- cannot be performed satisfactorily by civil service employees
- are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.

The Services are of such an:

- urgent
- temporary, or
- occasional nature

that the delay to implement under civil service would frustrate their very purpose.

**Justification:**  
Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER)



**P) Payment Method**

A. Reimbursement in arrears based on:  
 Itemized Monthly       Itemized Quarterly       Flat Rate       One-time  
 B. Advanced Payment  
 C. Other, explain:

**Q) Retention**

1. Is Agreement subject to retention?       No       Yes  
 If Yes, Will retention be released prior to Agreement termination?       No       Yes

**R) Justification of Rates**

Rates have been negotiated between the Energy Commission and the University of California.

**S) Disabled Veteran Business Enterprise Program (DVBE)**

1.  Exempt (Interagency/Other Government Entity)  
 2.  Meets DVBE Requirements      DVBE Amount:\$ \_\_\_\_\_ DVBE %: \_\_\_\_\_  
 Contractor is Certified DVBE  
 Contractor is Subcontracting with a DVBE: \_\_\_\_\_  
 3.  Contractor selected through CMAS or MSA with no DVBE participation.  
 4.  Requesting DVBE Exemption (attach CEC 95)

**T) Miscellaneous Contract Information**

1. Will there be Work Authorizations?       No       Yes  
 2. Is the Contractor providing confidential information?       No       Yes  
 3. Is the Contractor going to purchase equipment?       No       Yes  
 4. Check frequency of progress reports  
 Monthly       Quarterly       \_\_\_\_\_  
 5. Will a final report be required?       No       Yes  
 6. Is the agreement, with amendments, longer than a year? If yes, why?       No       Yes  
 The Department of General Services has agreed to give the Commission blanket authority to execute multi-year contracts to support the Commission's RD&D Programs.

**U) The following items should be attached to this CRF (as applicable)**

1. Exhibit A, Scope of Work	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
2. Exhibit B, Budget Detail	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
3. CEC 96, NCB Request	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
4. CEC 30, Survey of Prior Work	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
5. CEC 95, DVBE Exemption Request	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
6. CEQA Documentation	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
7. Resumes	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
8. CEC 105, Questionnaire for Identifying Conflicts		<input checked="" type="checkbox"/> Attached

Agreement Manager \_\_\_\_\_ Date \_\_\_\_\_ Office Manager \_\_\_\_\_ Date \_\_\_\_\_ Deputy Director \_\_\_\_\_ Date \_\_\_\_\_

**Exhibit A**  
**SCOPE OF WORK**

**TECHNICAL TASK LIST**

<b>Task #</b>	<b>CPR</b>	<b>Task Name</b>
1		Administration
2		Enhance and Update Cal-Adapt Visualizations
3		Expand Natural Gas System Climate Risk Visualizations
4		Communication and Outreach

**KEY NAME LIST**

<b>Task #</b>	<b>Key Personnel</b>	<b>Key Subcontractor(s)</b>	<b>Key Partner(s)</b>
1	Maggi Kelly, Nancy Thomas, Shruti Mukhtyar, and Mark O'Connor		
2			
3			
4			

**GLOSSARY**

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

<b>Acronym</b>	<b>Definition</b>
API	Application Programming Interface
CAT	California Climate Action Team
CCM	Commission Contract Manager
CMIP5	Coupled Model Intercomparison Project Phase 5: using a suite of General Circulation Models (GCMs), CMIP5 provides a standard set of climate change projections and model experiments that are aligned with the IPCC's Fifth Assessment Report.
CPR	Critical Project Review
D3	Data-Driven Documents: a Javascript library that provides powerful tools for data visualization.
Django	Free and open source web application framework written in Python, which follows the model-view-controller architectural pattern.
Django-Spillway	Open source python package that provides facilities for handling of raster and feature based geospatial data.
Energy Commission	California Energy Commission
GCM	General Circulation Model or Global Climate Model (terms used interchangeably): A computational model of the planetary atmosphere, which can be used to simulate changes in climate in response to driving factors such as greenhouse gas emissions.
GDAL	Geospatial Data Abstraction Library: a free and open source software

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<b>Acronym</b>	<b>Definition</b>
	library for reading and writing raster and vector geospatial data formats.
GIF	Geospatial Innovation Facility
HTTP	Hyper Text Transfer Protocol: used to communicate between web servers and web users
IPCC	Intergovernmental Panel on Climate Change
Javascript	The dominant web browser language for highly interactive webpages.
Leaflet	A modern open-source Javascript library for mobile-friendly interactive maps.
LOCA	Localized Constructed Analogs: a method for statistically downscaling climate model simulations of daily temperature and precipitation over western United States.
Mapnik	Open source toolkit for developing mapping applications.
PAC	Project Advisory Committee
PIER	Public Interest Energy Research
ReST	Representational State Transfer: an open source architecture for providing internet-based services
UC Berkeley	University of California at Berkeley
UCC.1	Uniform Commercial Code (Financing Statement)
USGS	United States Geological Survey

**Problem Statement**

California's natural gas system is vulnerable to a variety of weather- and climate-related events. However, in the context of a changing climate, historical records do not suffice to support effective planning and risk management. Rather, the natural gas system must be prepared to contend with a future climate that is different from what we experience today or have enjoyed in the past. Stakeholders involved in natural gas system management and planning must therefore have timely access to the best available, peer-reviewed data in a form that is easy to understand and amenable to decision-support. Substantial changes in the climate are projected to occur within a timeframe that overlaps with the time horizons of a variety of natural gas system planning decisions. The best available science is evolving quickly. Accordingly, providing natural gas system stakeholders with actionable data pertaining to local climate risks is an urgent priority that must be supported with sustained funding.

Basic visualizations of projected changes in climate parameters (e.g., temperature, wildfire risk, snow pack, and sea level rise) that are critical to California's energy system have been made available through Cal-Adapt (<http://cal-adapt.org/>). Cal-Adapt is a web-based visualization tool developed by the State through a contract with UC Berkeley's Geospatial Innovation Facility (GIF) to deliver relevant climate-related information, much of which is spatial in nature, to decision makers in a manner that allows them to turn research results and climate projections into effective adaptation decisions and policies. Released to the public in June 2011, Cal-Adapt had, by fall 2014, been visited by more than 46,000 unique visitors from 163 counties, 50 U.S.

## **Exhibit A**

### **SCOPE OF WORK**

states, and 573 California localities. While Cal-Adapt has already been used to integrate projected changes in peak demand into the Energy Commission's electricity sector planning efforts, more work remains to support natural gas sector planning and management through custom visualizations on Cal-Adapt.

Research supported by the State of California has illuminated, and continues to investigate, many of the climate risks and adaptation opportunities facing the energy system, including the natural gas system. For example, research under an ongoing contract with UC Berkeley demonstrates a number of vulnerabilities to sea level rise of the pipeline infrastructure in the San Francisco Bay Area. A recently-initiated contract with the United States Geological Survey (USGS) will shed light on how sea level rise-related risks in the Delta are compounded by subsidence. These and other efforts related to the natural gas sector will feed directly into the current proposed project, which leverages visualization and data-sharing capabilities of the State's Cal-Adapt resource, by providing high quality, peer-reviewed data and scientific analysis to serve as a foundation for tools that help stakeholders visualize local climate risks.

Recognizing that the natural gas system is vulnerable to climate-related changes and events such as sea level rise and wave run-up, inland flooding, subsidence of the delta and levees, and climate-related fluctuations in natural gas supply and demand, this agreement will ensure that the best peer-reviewed scientific results are visualized in a readily accessible, understandable form to support planning and adaptation efforts.

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

The goal of this Agreement is to provide critical support to communicate scientific advances regarding climate-related risks to the natural gas sector and foster planning to protect infrastructure and vulnerable populations. This project is essential because different skills, and generally different types of scientists, are needed to effectively convey climate science to diverse stakeholders than are needed to generate the scientific data. A concerted outreach effort is critical to ensure that the results of the project reach the target audiences. Delivery and communication of readily understandable visualizations depicting climate-related risks to stakeholders who are responsible for protecting natural gas infrastructure and planning for future reliability will support efforts to protect ratepayers from major disruptions.

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

The objectives of this Agreement are to launch updates to visualization tools and data currently hosted on Cal-Adapt, to develop visualizations tailored to natural gas sector needs, and to migrate Cal-Adapt to an open source RESTful Application Programming Interface (API) to host the site's data and tools. A RESTful API can be described as a machine-readable web-based representation of data resources utilizing the functionality of the HTTP protocol. Compared to other forms of web services, simplicity, ease of use, and interoperability are among the main advantages of RESTful architecture.

Moving to an API will allow Cal-Adapt to accommodate new higher resolution downscaled Coupled Model Intercomparison Project Phase 5 (CMIP5) climate

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projections with additional Intergovernmental Panel on Climate Change (IPCC) scenarios and General Circulation Models (GCM) models, as well as improved regional downscaling routines that offer more realistic portrayals for extreme events in California. Given the vast amount of data available through the site, it is impossible for a single organization to build tools that might satisfy every potential use of the information. With a Cal-Adapt API, developers from other organizations will be able to access the data and build domain specific visualization and planning tools on top of it.

The Cal-Adapt API will be built upon the foundation of Django and Django REST Framework. Additional capabilities for spatial querying and serialization to geo-formats will be provided by the Django-Spillway package, an open source library developed at GIF. This includes the handling of Geospatial Data Abstraction Library (GDAL)-supported raster formats and rendering via Mapnik. This powerful combination of tools will enable a creation of a flexible, spatially-enabled web API, through which developers and researchers can access the rich environmental and climate variables available through Cal-Adapt. The API will support integration of temporal raster data, non-temporal geospatial data layers, and other datasets associated with California's Fourth Climate Change Assessment.

#### **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:

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- 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)
- Establish the TAC (Task 1.10) (optional)
- TAC Meetings (Task 1.11) (optional)

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

#### **Contractor Deliverables:**

- An Updated Schedule of Deliverables
- An Updated Gantt Chart (if included)
- 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.

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- 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.
- 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

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**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

## **Exhibit A SCOPE OF WORK**

### **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

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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.

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- 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.

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- 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

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- 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.

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- 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)

#### **PAC**

##### **Task 1.10 Establish the PAC**

The goal of this task is to create an advisory committee for this Agreement.

The PAC should be composed of diverse professionals. The number can vary depending on potential interest and time availability. The exact composition of the PAC may change as the need warrants. PAC members serve at the discretion of the Commission Contract Manager.

The PAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter
- Members of the trades who will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives)
- Public Interest Market Transformation Implementers
- Product Developers relevant to project subject matter
- U.S. Department of Energy Research Manager
- Public Interest Environmental Groups
- Utility Representatives
- Members of the relevant technical society committees

The purpose of the PAC is to:

- Provide guidance in research direction. The guidance may include scope of research; research methodologies; timing; coordination with other research. The guidance may be based on:
  - technical area expertise
  - knowledge of market applications
  - linkages between the agreement work and other past, present or future research (both public and private sectors) they are aware of in a particular area.
- Review deliverables. Provide specific suggestions and recommendations for needed adjustments, refinements, or enhancement of the deliverables.
- Evaluate tangible benefits to California of this research and provide recommendations, as needed, to enhance tangible benefits.

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- Provide recommendations regarding information dissemination, market pathways or commercialization strategies relevant to the research products.

#### **The Contractor shall:**

- Prepare a draft list of potential PAC members that includes name, company, physical and electronic address, and phone number and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting. This list will be discussed at the kick-off meeting and a schedule for recruiting members and holding the first PAC meeting will be developed.
- Recruit PAC members and ensure that each individual understands the member obligations described above, as well as the meeting schedule outlined in Task 1.11.
- Prepare the final list of PAC members.
- Submit letters of acceptance or other comparable documentation of commitment for each PAC member.

#### **Deliverables:**

- Draft List of PAC Members
- Final List of PAC Members
- Letters of acceptance, or other comparable documentation of commitment for each PAC Member

#### **Task 1.11 Conduct PAC Meetings**

The goal of this task is for the PAC to provide strategic guidance to this project by participating in regular meetings or teleconferences.

#### **The Contractor shall:**

- Discuss the PAC meeting schedule at the kick-off meeting. The number of face-to-face meetings and teleconferences and the location of PAC meetings shall be determined in consultation with the Commission Contract Manager. This draft schedule shall be presented to the PAC members during recruiting and finalized at the first PAC meeting.
- Organize and lead PAC meetings in accordance with the schedule. Changes to the schedule must be pre-approved in writing by the Commission Contract Manager.
- Prepare PAC meeting agenda(s) with back-up materials for agenda items.
- Prepare PAC meeting summaries, including recommended resolution of major PAC issues.

#### **Deliverables:**

- Draft PAC Meeting Schedule
- Final PAC Meeting Schedule
- PAC Meeting Agenda(s) with Back-up Materials for Agenda Items
- Written PAC meeting summaries, including recommended resolution of major PAC issues

## Exhibit A SCOPE OF WORK

### 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 ENHANCE AND UPDATE CAL-ADAPT VISUALIZATIONS

The goal of this task is to launch updates to visualization tools currently hosted on Cal-Adapt and develop new natural gas system-related visualizations.

#### **The Contractor shall:**

- Add new CMIP5 climate projections, which are being downscaled for California using the Localized Constructed Analogs (LOCA) method under an Energy Commission contract with Scripps Institute of Oceanography, UC San Diego. This data will be of higher resolution (1/16 degrees latitude/longitude) than what is currently available in Cal-Adapt and will include climate model simulations of temperature and precipitation at daily time steps.
- Update visualization tools using more modern and powerful open source Javascript libraries for mapping and visualization (e.g. Leaflet and D3).
- Redesign Cal-Adapt's tool interface to be responsive to different screen sizes and provide functionality for easily embedding maps in articles and blog posts.
- Add functionality for aggregating climate variables by additional boundaries (e.g. census tracts, watersheds, climate zones). The Cal-Adapt API will enable users to summarize and download data within their chosen boundary.
- Add descriptions to charts and maps to offer users clear and accurate interpretations of the information presented.
- Prepare and provide an *API Memo* detailing the launch of the ReSTful API in language appropriate for an outreach newsletter as well as for the Cal-Adapt website's announcements section.
- Prepare and provide a *Data Memo* detailing the launch of higher-resolution data that leverage improved downscaling (LOCA) as well as CMIP5 projections, in language appropriate for an outreach newsletter as well as for the Cal-Adapt website's announcements section.
- Prepare and provide an *Improved Visualizations Memo* detailing improvements to visualization tools in language appropriate for an outreach newsletter as well as the Cal-Adapt website; this memo may also include technical language suitable for applications developers and other information technology professionals.
- Prepare and provide an *Additional Features Memo* detailing any other new, enhanced, or updated visualization features, such as aggregation by a variety of jurisdictional and natural boundaries or descriptive language to foster clear interpretation and appropriate use of information.

## **Exhibit A**

### **SCOPE OF WORK**

#### **Deliverables:**

- API Memo
- Data Memo
- Improved Visualizations Memo
- Additional Features Memo

#### **TASK 3 EXPAND NATURAL GAS SYSTEM CLIMATE RISK VISUALIZATIONS**

The goal of this task is to incorporate natural gas system-related visualizations that depict climate-related risks to stakeholders who are responsible for protecting natural gas infrastructure and planning for future reliability.

#### **The Contractor shall:**

- Provide for visualizations of climate-mediated changes and extreme weather events, including visualizations of vulnerability of California's natural gas sector to storm events and sea level rise.
- Provide for visualizations of inland flooding and wildfires, which could affect California's natural gas system.
- Develop and/or support development of custom tools to aid planning, management, and operations of the natural gas system; these tools could leverage regionally downscaled climate change projections available on Cal-Adapt as well as a federal tool (under development) that will offer additional data and analyses.
- Maintain flexibility to include a variety of data layers as they become available.
- Prepare and provide a Natural Gas Systems Visualizations Memo detailing the launch of new visualizations in language appropriate for an outreach newsletter as well as for the Cal-Adapt website's announcements section.

#### **Deliverables:**

- Natural Gas Systems Visualizations Memo

#### **TASK 4 COMMUNICATION AND OUTREACH**

The goal of this task is to provide communication and outreach between the scientists who are producing new climate change information and users of the information including: natural gas sector stakeholders, local planners and decision makers, experts from other fields, and the general public.

#### **The Contractor shall:**

- Highlight case studies of climate adaptation in the natural gas sector by providing links to ongoing projects and other state adaptation resources.
- Provide for outreach and training of potential users of Cal-Adapt who are involved with addressing natural gas sector vulnerability and resilience with in-person or webinar style workshops and videos.
- Offer communication and outreach regarding guidance or management options to increase resilience to climate change-related vulnerabilities. This includes publishing a newsletter that updates users on any changes to Cal-Adapt, recent adaptation related news and links to new or key state adaptation resources.

**Exhibit A**  
**SCOPE OF WORK**

- Prepare and provide a *Newsletters Memo* comprising newsletters released throughout the life of this contract. Newsletters should be released at a frequency of at least bimonthly, beginning no later than the third quarter of 2015.
- Prepare and provide Training Visuals (e.g., presentation slides) to support training and outreach efforts targeting natural gas sector stakeholders and responsive to input from the TAC.

**Deliverables:**

- Newsletters Memo
- Training Visuals

**Exhibit A  
SCOPE OF WORK**

**SCHEDULE OF DELIVERABLES AND DUE DATES**

<b>University of California, Berkeley</b>				
<b>Task Number</b>	<b>Task Name</b>	<b>Deliverable(s)</b>	<b>Planned Start Date</b>	<b>Planned Completion Date</b>
<b>1.0</b>	<b>Administration</b>		<b>5/13/2015</b>	<b>12/29/2017</b>
1.1	Attend Kick-off Meeting	An Updated Schedule of Deliverables	5/22/2015	6/22/2015
		An Updated List of Match Funds	5/22/2015	6/24/2015
		An Updated List of Permits	N/A	N/A
		Schedule for Recruiting PAC Members	5/22/2015	7/22/2015
	Commission Contract Manager Deliverables	Final report Instructions	5/22/2015	6/22/2015
1.2	CPR Meetings	CPR Report(s)	N/A	N/A
		CPR deliverables identified in this Scope of Work	N/A	N/A
	Commission Contract Manager Deliverables	Agenda and a List of Expected Participants	N/A	N/A
		Schedule for Written Determination	N/A	N/A
		Written Determination	N/A	N/A
1.3	Final Meeting	Written documentation of meeting agreements and all pertinent information	11/22/2017	12/22/2017
		Schedule for completing closeout activities	12/22/2017	12/29/2017
1.4	Quarterly Progress Reports	Quarterly Progress Reports	8/24/2015	1/19/2018
1.5	Test Plans, Technical Reports and Interim Deliverables		N/A	N/A
<b>1.6</b>	<b>Final Report</b>		<b>8/22/2017</b>	<b>11/17/2017</b>
1.6.1	Final Report Outline	Draft Outline of the Final Report	8/22/2017	9/5/2016
		Final Outline of the Final Report	9/5/2017	9/19/2017
1.6.2	Final Report	Draft Final Report	9/19/2017	10/18/2017
		Final Report	10/18/2017	11/17/2017
1.7	Identify and Obtain Matching Funds	A letter regarding Match Funds or stating that no Match Funds are provided	5/22/2015	6/22/2016
		Letter(s) for New Match Funds	N/A	N/A

**Exhibit A  
SCOPE OF WORK**

		A copy of each Match Fund commitment letter	N/A	N/A
		Letter that Match Funds were Reduced (if applicable)	N/A	N/A
1.8	Identify and Obtain Required Permits	A letter documenting the Permits or stating that no Permits are required	5/22/2015	6/22/2015
		Updated list of Permits as they change during the Term of the Agreement	N/A	N/A
		Updated schedule for acquiring Permits as it changes during the Term of the Agreement	N/A	N/A
		A copy of each approved Permit	N/A	N/A
1.9	Electronic File Format	A Letter requesting exemption from the Electronic File Format (if applicable)	N/A	N/A
1.10	Establish the PAC	Draft List of PAC Members	5/22/2015	6/22/2015
		Final List of PAC Members	6/22/2015	7/22/2015
		Letters of acceptance, or other comparable documentation of commitment for each PAC Member	6/22/2015	7/22/2015
1.11	Conduct PAC Meetings	Draft PAC Meeting Schedule	7/22/2015	8/24/2015
		Final PAC Meeting Schedule	8/24/2015	10/18/2017
		PAC Meeting Agenda(s) with Back-up Materials for Agenda Items	8/24/2015	10/18/2017
		Written PAC meeting summaries, including recommended resolution of major PAC issues	8/24/2015	10/18/2017
		<b>Technical Tasks</b>	<b>5/22/2015</b>	<b>10/18/2017</b>
2.0	Enhance and Update Cal-Adapt Visualizations	<ul style="list-style-type: none"> <li>• API Memo</li> <li>• Data Memo</li> <li>• Improved Visualization Memo</li> <li>• Additional Features Memo</li> </ul>	5/22/2015	10/18/2017
3.0	Expand Natural Gas System Climate Risk Visualizations	<ul style="list-style-type: none"> <li>• Natural Gas Systems Visualizations Memo</li> </ul>	5/22/2015	10/18/2017
4.0	Communication and Outreach	<ul style="list-style-type: none"> <li>• Newsletters Memo</li> <li>• Training Visuals</li> </ul>	5/22/2015	10/18/2017

STATE OF CALIFORNIA

STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: UNIVERSITY OF CALIFORNIA, BERKELEY

**RESOLVED**, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the Agreement Request Form; and

**RESOLVED**, that the Energy Commission approves Agreement 500-14-003 with the **Regents of the University of California on behalf of the Berkeley Campus** for a **\$300,000** contract to deliver readily accessible visualizations and information tailored to support climate resilient planning, management, and decision-making in the natural gas sector; and

**FURTHER BE IT RESOLVED**, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

**CERTIFICATION**

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on April 8, 2015.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

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Harriet Kallemeyn,  
Secretariat