

EXHIBIT A

SCOPE OF WORK

Purpose

This architectural and engineering professional services technical support contract will provide the Energy Commission access to nonresidential building energy science experts that are not available within state service. The Contractor will work under the direction of the Energy Commission to complete engineering and econometric analyses as well as the analysis tool development that is needed to support the advancement of nonresidential building energy performance that is the objective of the state's Building Energy Efficiency Standards (Standards). The majority of technical services currently needed by the Energy Commission revolve around the design, specification and development of building energy analysis tools needed to support the implementation of the Standards.

The Energy Commission intends to use this Agreement to begin the process of collaboratively developing, testing, documenting, and supporting open source building energy modeling software and other building energy analysis tools used for Standards development, Standards compliance and other energy efficiency and clean energy public policy implementation. It is the intent of the Energy Commission to migrate these building energy modeling and analysis tools into an open source forum, therefore, unless otherwise specified, the software developed in this Agreement will be made available by the Contractor and their subcontractors under an open source license recommended by the Program Advisory Committee and approved by the CCM.

Primary Tasks and Tentative Completion Dates

The major categories of work are divided into the following tasks:

Task #	Task	Tentative Completion Date
1	Contract Management	June 2013
2	Establish PAC	August 2011
3	Conduct PAC Meetings	May 2013
4	Administer Software Development and Distribution	May 2013
5	2013 Nonresidential Standards ACM Reference Method	March 2012
6	Computer Generated Nonresidential Standards Compliance Forms	March 2012
7	2013 Nonresidential Standards ACM Ruleset	January 2012

Task #	Task	Tentative Completion Date
8	2013 Nonresidential Standards Compliance Engine	August 2012
9	2013 Nonresidential Standards ACM Ruleset & Engine Pilots in Compliance Software 2013 Nonresidential Standards Simple Compliance Tool	February 2013
10	2013 Nonresidential Standards ACM Compliance Software	February 2013
11	Contingencies and Additional Topic Areas	Per Work Authorizations

This is a "Work Authorization" Contract and no work shall be undertaken unless authorized by the Energy Commission through a specific written document called a Work Authorization (WA). WAs specifying the tasks, deliverables and costs shall be used for all work assignments. WAs for technical tasks will be made on an as-needed basis. The specific task(s) and the level of effort for each task will vary from project to project. A fully executed copy of the WA must be obtained from the CCM before work can begin on any WA. Workflow will depend on demand for service. Demand is uncertain and, therefore, there will be no guarantee of work for the prime contractor or any subcontractor

The Commission Contract Manager will prepare and issue the written work authorizations and may set a maximum price, budget, and schedule for the work to be performed. The Commission Contract Manager will work, in consultation with the Contractor, to assign work to either the Contractor or a subcontractor. The Energy Commission reserves the right to direct the Contractor to increase expertise on any particular task by soliciting for additional subcontractors.

The Contract Manager may change the schedule for tentative completion dates by written notice to the contractor.

TASK 1: CONTRACT MANAGEMENT

The Contractor's responsibilities under this task include, but are not limited to the following:

TASK 1.1 - WORK AUTHORIZATIONS

The Contractor shall:

- Administer Work Authorizations. At the direction of the CCM, and in conjunction with the CCM prepare work authorizations that define the scope of work, the schedule of deliverables and the project budget. Per Exhibit E, in the Terms and Conditions of the Agreement each WA shall include but not be limited to the following:
 1. Contract Number

2. WA Number
 3. WA Title
 4. Effective Date
 5. End Date
 6. Objective or goal of the WA
 7. Detailed scope of work and tasks
 8. What task the WA falls within in the Contract
 9. Schedule/Due dates and Deliverables
 10. Contact Information
 11. Contractor and Subcontractor personnel who will perform the work
 12. Identification of DVBE
 13. Detailed Budget
 - Hours and fully loaded hourly rates by person or job classification, as allowed by Contract budget
 - Travel and per diem, as allowed by Contract budget
 - Other direct costs, as allowed by Contract budget (i.e. postage)
 14. Other items as required by CCM
- Monitor and track each WA and the overall contract. Ascertain the fiscal status of each WA and the overall contract, prevent accumulation of cost overruns, determine if each WA is on schedule, determine that all deliverables have been submitted and accepted and track the start, progress and closure for each WA.

TASK 1.2 - KICKOFF MEETING

The Contractor shall:

- Participate in a “kick-off” meeting with the CCM, Contracts Officer, and the Accounting Office. The Contractor shall include at a minimum their Project Manager, Contract Administrator, and Accounting Officer. The administrative and technical aspects of this contract will be discussed.

TASK 1.3 - INVOICES

The Contractor shall:

- Prepare and submit an invoice for all reimbursable expenses incurred performing work under this contract in compliance with the Terms and Conditions of the contract. Official invoices must be submitted to the Energy Commission’s Accounting Office.

TASK 1.4 - SUBCONTRACTORS

In the event Subcontractors are part of the Contractor’s SOQ the Contractor shall:

- Manage and coordinate subcontractor activities. The Contractor is responsible for the quality of all subcontractor work. The Energy Commission will assign all work to the Contractor and the Contractor shall be responsible for the Subcontractor(s). If the Contractor needs to replace a subcontractor or decides to add new subcontractors, they shall 1) comply with the terms and conditions of the contract, and 2) notify the CCM who will follow the Energy Commission's process for adding or replacing subcontractors.

On an ongoing basis the Contractor shall perform the following tasks:

- Prepare and issue contract agreements with subcontractors that include all required provisions contained in the Agreement between the Energy Commission and the Contractor;
- Respond in a timely fashion to information requests or direction from the Commission Contract Manager;
- Coordinate availability of subcontractors to meet needs of the Energy Commission staff;
- Solicit for additional technical expertise upon direction by the Commission Contract Manager;
- Require subcontractors to provide invoices which correctly identify personnel, actual hourly rates and direct expenses charged to each work authorization and provide back-up documentation for expenses; and
- Maintain a current Agreement spreadsheet capable of tracking Contractor and subcontractor work activity, Contractor and subcontractor invoice activity, and the status of work authorizations.

TASK 1.5 - Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the objectives of the project.

The Contractor shall:

Prepare monthly progress reports that summarize all contract activities conducted by the Contractor and their subcontractors for the reporting period, including an assessment of the ability to complete the contract within the current budget and any anticipated cost overruns. This monthly progress report shall include a summary of Agreement expenditures to date.

- Each progress report is due to the CCM within 15 working days after the end of the reporting period. The Commission Contract Manager will specify the report format and the number of copies to be submitted. All progress reports should coincide with the invoice period.

Deliverables:

- Monthly Progress Reports

TASK 1.6 – Program Meetings and Briefings

At the request of the Energy Commission's Contract Manager, the Contractor and subcontractors shall be available for meetings or to provide written and/or verbal program briefings to the Energy Commission's staff or others. Some meetings will be conducted in person, by phone and the internet, as determined by the Commission Contract Manager. The cost of meetings will be included in each work authorization.

TASK 2: ESTABLISH PAC

The goal of this task is to create a Program Advisory Committee (PAC) for this Agreement. The purpose of the PAC is to provide guidance, input, review and comment on deliverables developed under this Agreement.

The PAC should be composed of building industry representatives and public goods program managers interested in collaboratively developing software tools and data that facilitate the energy efficient design, construction, operation and renovation of nonresidential buildings. If possible, the PAC should have members experienced with open source licensing of building modeling software. The number of professionals on the PAC can vary depending on potential interest and time availability. The Contractor's Project Manager and the Commission Contract Manager shall act as co-chairs of the PAC. 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:

- Building industry experts knowledgeable about building energy simulation and/or mechanical system design and operations,
- Members of the trades who will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives),
- Software product developers relevant to project subject matter,
- Professionals with open source software management experience,
- U.S. Department of Energy Building Technologies Group building simulation project manager,
- California utility representatives with program responsibilities in areas requiring building energy simulation tools.

The purpose of the PAC is to:

- Review deliverables and provide specific suggestions and recommendations for needed adjustments, refinements, or enhancement of the deliverables,
- Provide input on the process of migrating compliance software and building energy modeling tools to an open source forum and the associated computer hardware needed to house the open source software applications and data,
- Provide recommendations regarding information dissemination, market pathways and/or further collaborative opportunities relevant to the building energy modeling procedures and software tools developed in this Agreement.

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 before work begins on the remainder of Agreement tasks.
- Recruit PAC members and ensure that each individual understands the member obligations described above, as well as the meeting schedule outlined in Task 3.
- 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 3: PAC MEETINGS

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

The Contractor shall:

- Discuss the PAC meeting schedule with the Commission Contract Manager. 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

TASK 4: ADMINISTER SOFTWARE DEVELOPMENT AND DISTRIBUTION

The goal of this task is to complete the necessary work to ensure that all software developed under this Agreement is complete, appropriately tested, debugged and documented, then licensed to and/or made available for use by the public consistent with Commission Contract Manager's written direction.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Propose, and after obtaining written approval of the CCM, implement the Nonresidential Building Science Software Development Plan detailing the steps and process taken to integrate building engineering science, formulas and data into each software product of this Agreement.
- Propose, and after obtaining written approval of CCM, implement a quality assurance program. The CCM approved software documentation, testing and acceptance criteria as well as other appropriate software quality assurance procedures shall be documented in a Nonresidential Building Science Software Quality Assurance Plan,
- Prepare a Nonresidential Building Science Software Development Report that documents how the work included in this Agreement was completed following the CCM approved Nonresidential Building Science Software Development Plan and Nonresidential Standards Software Quality Assurance Plan. At a minimum, the report shall summarize how each of the requirements and procedures in these two software development plans were implemented during the development of the software specified in this SOW, summarizing the significant issues that arose and how they were addressed.
- Propose, and after obtaining written approval of CCM, implement licensing procedures that allow access to software and data developed under this Agreement. A report shall be prepared detailing the CCM approved licensing procedures and shall at a minimum report on the costs of establishing and maintaining the software in an open source setting, how to encrypt or otherwise protect specific computer code and data (such as the 2013 Standards Compliance Engine Plug-in) security issues and backup issues and the requirements for migrating the software if necessary in the future. The report shall also document the licensing procedures for each of the software products developed under this Agreement. The report shall be called the Nonresidential Standards Software Licensing Report.

Deliverables:

- Nonresidential Building Science Software Development Plan
- Nonresidential Building Science Software Quality Assurance Plan
- Nonresidential Building Science Software Development Report
- Nonresidential Building Science Software Licensing Report

TASK 5: 2013 NONRESIDENTIAL STANDARDS ACM REFERENCE METHOD

The goal of this task is to develop the set of nonresidential building energy modeling results and reference data that all ACM computer programs will be compared to as part of the Energy Commission's compliance software certification for the 2013 Nonresidential Standards.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Work with CCM and PAC to create a list of building types and mechanical systems that broadly represent the range of newly constructed nonresidential buildings anticipated in California over the next 10 years,
- Gather, generate or otherwise obtain building energy modeling results and/or empirical data for the building types and mechanical systems listed in this task,
- Work with CCM and PAC to establish, test, refine and document the criteria used to determine that specific building energy modeling results and/or empirical data are relatively accurate and appropriate for use within the 2013 Nonresidential Standards reference method for nonresidential building types and mechanical systems across the diversity of California's climate regions,
- Review the collected building energy modeling results and empirical data using the documented criteria and select the items appropriate for inclusion in the 2013 Nonresidential Standards reference method.

Deliverables:

- List of Building and Mechanical System Types to be included in the 2013 Nonresidential Standards ACM Reference Method
- Criteria for Acceptable Modeling Results and/or Reference Data for use in the 2013 Nonresidential Standards ACM Reference Method
- 2013 Nonresidential Standards ACM Reference Method

TASK 6: COMPUTER GENERATED NONRESIDENTIAL STANDARDS COMPLIANCE FORMS

The goal of this task is to leverage the work completed in the 2013 Residential and Nonresidential Standards Compliance Form Generator project within the Residential Building Energy Science technical support contract (400-10-016) to contribute to the compliance reporting needs of the 2013 Nonresidential Standards Compliance Engine developed in Task 8. This will require expert knowledge of the Nonresidential Standards compliance documentation requirements and a thorough understanding of how to compute the specific building energy performance metrics to be included in the 2013 Nonresidential Standards compliance documentation. This task activity also includes working with the Residential building Energy Science technical support contractor to determine the functional requirements and software specifications for the nonresidential portion of the 2013 Residential and Nonresidential Standards Compliance Form Generator.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Work with the Residential Building Energy Science technical support contractor to develop the functional requirements for the nonresidential portion of the 2013 Residential and Nonresidential Standards Compliance Form Generator,
- Work with the Residential Building Energy Science technical support contractor to develop the software specifications for the nonresidential portion of the 2013 Residential and Nonresidential Standards Compliance Form Generator,
- Work with the appropriate consultants on the Residential Building Energy Science technical support contract team to understand how the work completed in the 2013 Residential and Nonresidential Standards Compliance Form Generator project can contribute to the form generation needs of the 2013 Nonresidential Standards Compliance Engine,
- Work with CCM and PAC to develop the functional requirements for software that generates 2013 Nonresidential Standards compliance forms,
- Work with CCM and PAC to develop and document software specifications for a 2013 Nonresidential Standards Compliance Forms plug-in and API that satisfy the functional requirements developed in this task,
- Complete software development consistent with the quality assurance standards developed in Task 4 to meet the software specifications developed in this task.

Deliverables:

- Functional Requirements for software to generate 2013 Nonresidential Standards compliance forms
- Software Specifications to generate 2013 Nonresidential Standards compliance forms
- 2013 Nonresidential Standards Compliance Forms Plug-in
- 2013 Nonresidential Standards Compliance Forms Plug-in Documentation

TASK 7: 2013 NONRESIDENTIAL STANDARDS ACM RULESET

The goal of this task is to update and enhance the draft 2013 Nonresidential Standards ACM Ruleset as necessary to complete the 2013 Nonresidential Standards ACM Ruleset. This work will require the translation of building energy performance data and energy related building operational characteristics into Title 24 data dictionary terms and logical operators to apply the performance standards requirements to nonresidential building designs.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Review the Standards data dictionary terms, databases, logical operators and baseline building energy system models used in the 2008 Nonresidential Standards ACM Ruleset and modify and/or add terms, operations, building energy models and data elements as necessary to express the required 2013 Nonresidential Standards performance rules as delineated in the draft 2013 Nonresidential ACM Manual (to be provided to the Contractor by the CCM),

- Work with the CCM and the PAC to develop the functional requirements for the 2013 Nonresidential Standards ACM ruleset development software. This software will be used to create, modify, store, evaluate, test and debug the 2013 Nonresidential Standards performance rules developed in this task,
- Work with CCM and PAC to develop and document software specifications for the 2013 Nonresidential Standards ACM ruleset development software that satisfy the functional requirements developed in this task,
- Complete software development consistent with the quality assurance standards developed in Task 4 to meet the software specifications developed in this task.

Deliverables:

- 2013 Nonresidential Standards ACM Ruleset Development Software Functional Requirements
- 2013 Nonresidential Standards ACM Ruleset Development Software Specifications
- 2013 Nonresidential Standards ACM Ruleset
- 2013 Nonresidential Standards ACM Ruleset Documentation
- Nonresidential Standards ACM Ruleset Development Software
- Nonresidential Standards ACM Ruleset Development Software Documentation

TASK 8: 2013 NONRESIDENTIAL STANDARDS COMPLIANCE ENGINE

The goal of this task is to develop the software necessary to encapsulate the 2013 Nonresidential Standards ACM Ruleset developed in Task 7 and the OpenStudio API into a 2013 Nonresidential Standards ACM Compliance Engine application plug-in. This task will require the specification of the physical and thermal properties of nonresidential building components that must be provided in an electronic data exchange procedure to meet the building energy modeling requirements of the 2013 Nonresidential performance Standards. This work will also require the specification of the building energy performance results to be included in the compliance engine software output data exchange procedures. The compliance engine will likely be licensed and available to building energy design application software vendors to implement 2013 Nonresidential Standards compliance checking and documentation. The compliance engine shall be designed such that it can be protected from being modified if used in a vendor's compliance software tool. The reason is that when the Energy Commission certifies compliance software, this component must be unalterable in each vendor's software to maintain consistency of results and certification status. The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Work with the CCM and the PAC to develop the functional requirements for the 2013 Nonresidential Standards compliance engine,
- Work with the CCM and the PAC to develop and document software specifications for the 2013 Nonresidential Standards compliance engine that satisfy the functional requirements developed in this task,

- Complete software development consistent with the quality assurance standards developed in Task 4 to meet the software specifications developed in this task. The following are subtasks to be included:
 - Incorporate OpenStudio API into compliance engine software,
 - Incorporate 2013 Nonresidential Standards ACM Ruleset into compliance engine software,
 - Review all applicable data exchange schema, select the most appropriate schema and extend it as necessary for use in import of building design data and export of building energy modeling results,
 - Incorporate the 2013 Nonresidential Standards Compliance Forms application plug-in developed in Task 6,
- Complete the software architecture necessary to compile and distribute the 2013 Nonresidential Standards ACM compliance engine as an application plug-in,
- Develop software to test, debug and demonstrate the functionality of the 2013 Nonresidential Standards ACM compliance engine.

Deliverables:

- 2013 Nonresidential Standards Compliance Engine Functional Requirements
- 2013 Nonresidential Standards Compliance Engine Software Specifications
- 2013 Nonresidential Standards Compliance Engine Plug-in
- 2013 Nonresidential Standards Compliance Engine Plug-in Documentation
- 2013 Nonresidential Standards Compliance Engine Demonstration Software
- 2013 Nonresidential Standards Compliance Engine Demonstration Software Documentation

TASK 9: 2013 NONRESIDENTIAL STANDARDS RULESET & COMPLIANCE ENGINE PILOTS IN COMPLIANCE SOFTWARE

The goal of this task is to pilot the use of the 2013 Nonresidential Standards ACM ruleset and compliance engine in building energy design software tools used by the mechanical engineering design industry. These pilots will provide the Energy Commission with an understanding of the issues and opportunities for private vendor energy analysis tools to incorporate the compliance engine into their software products. This work will include engineering reviews of the standard and proposed building designs modeled by the energy analysis tools participating in this compliance engine pilot, to determine if the performance standard requirements are being implemented appropriately and producing the correct results. One task goal is to pilot the 2013 Nonresidential Standards ACM ruleset in building energy design software that does not use EnergyPlus as the building energy simulation component. Another goal is to pilot the 2013 Nonresidential Standards ACM compliance engine (that does use EnergyPlus for the simulation component) in building energy design software. The building energy design software used in these pilots shall have either previously been certified by the Energy Commission as compliance software or have the necessary functionality to be

considered for certification by the Energy Commission as compliance software in the future. There is no connection between the work in this task and any future Energy Commission activity related to the certification of Nonresidential Standards compliance software.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Work with the CCM and the PAC to determine the appropriate Standards software integration pilots to meet the goals of this task. Work with the CCM and the PAC to establish the energy analysis software qualifications for participation in this task activity,
- The Energy Commission expects to pilot the 2013 Nonresidential Standards ACM Ruleset and Compliance Engine with qualified software vendors. If technical staff from a qualified software vendor are not already included on the Contractor team, the Contractor shall work with the Energy Commission to recruit and add technical support subcontractors to this Agreement to complete the compliance engine pilots with qualified software vendors. There must be at least one compliance engine pilot to satisfy the requirements of this task,
- Work with the CCM and the PAC to develop a 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstration Plan that explains the scope, process, timing, energy analysis software qualifications, software development efforts and evaluation metrics for the software pilots identified in this task,
- Complete the software development efforts required to demonstrate the functionality of the 2013 Nonresidential Standards ACM ruleset and compliance engine in building energy design software tools chosen for participation in this task's pilots,
- Complete the piloting activities delineated in the 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstration Plan,
- Document the results of the software pilots in a 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstration Task Report.

Deliverables:

- 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstration Plan
- 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstrations
- 2013 Nonresidential Standards ACM Ruleset and Compliance Engine Demonstration Task Report

TASK 10: 2013 NONRESIDENTIAL STANDARDS ACM COMPLIANCE SOFTWARE

The goal of this task is to develop a user interface for the 2013 Nonresidential Standards ACM compliance engine developed in Task 8 that results in software that can be certified by the Energy Commission as 2013 Nonresidential Standards compliance software. This work includes specifying a method for the software user to

enter the required building energy characteristics for use in the compliance analyses and also specifying a method to return the compliance results to the user. The Energy Commission anticipates that the 2013 Nonresidential Standards ACM Compliance Engine Demonstration Software developed in Task 8 will be the best starting point for the software development needed for this task.

The Contractor shall complete the activities necessary to complete this task, which include but are not limited to the following:

- Work with the CCM and the PAC to develop the functional requirements for the 2013 Nonresidential Standards compliance software,
- Work with the CCM and the PAC to develop and document software specifications for the 2013 Nonresidential Standards compliance software that satisfy the functional requirements developed in this task,
- Complete software development consistent with the quality assurance standards developed in Task 4 to meet the software specifications developed in this task.

Deliverables:

- 2013 Nonresidential Standards Compliance Software Functional Requirements
- 2013 Nonresidential Standards Compliance Software Specifications
- 2013 Nonresidential Standards Compliance Software
- 2013 Nonresidential Standards Compliance Software Documentation

TASK 11 - CONTINGENCIES AND ADDITIONAL TOPIC AREAS

The Contractor shall provide technical expertise to conduct unexpected nonresidential building energy related engineering and econometric analyses necessary to support the nonresidential building science software tools specified in this SOW as they arise throughout the Agreement period.

Deliverables: Will be defined as needed through Work Authorizations