

EXHIBIT A

SCOPE OF WORK

Purpose

The purpose of this amendment #1 to the Agreement is to add \$250,000 to provide for additional work for contractor to assist the Energy Commission in revising the California Building Energy Efficiency Standards for 20112013. The Contractor Manager will provide Contractor with defined Key Topic Areas listed in Appendix to Exhibit A to use for completing the following tasks. The revised Building Energy Efficiency Standards originally scheduled for adoption in 2011 have been extended to 2013. All references to 2011 Standards are changed in this amendment #1 to 2013 Standards. The additional funding will allow the Energy Commission to issue work authorizations for contractor to perform more in-depth work than originally anticipated. Since implementation of the standards was extended to 2013, the additional funding will be used for more detailed analysis within the original scope of work.

Primary Tasks and Tentative Completion Dates

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

Task #	Task	Tentative Completion Date
1	Evaluation of the Cost Effectiveness of Solar Electric Systems in Nonresidential Building Standards	April <u>June 1, 2011</u> [*]
2	Life Cycle Cost Methodology for the 2011 <u>2013</u> Standards	April <u>December 1, 2010</u> [*]
3	2011 <u>2013</u> Standards Nonresidential Measure Identification and Analysis Plan	April <u>May 1, 2010</u> [*]
4	Nonresidential Alternative Calculation Method (ACM)	Jul 31, 2010 – December 30, 2011 [*]
5	Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards	May 31 <u>February 1, 2011</u> [*]
6	Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards	May 31 <u>June 1, 2010</u> [*]
7	Standards, Reference Appendices, Nonresidential ACM Manuals	May 31 <u>September 1, 2011</u> [*]
8	Impact Analysis Report for Mandatory Nonresidential Standards	Jul 29, 2011 [*] <u>May 1, 2012</u> [*]
9	Impact Analysis Report for Reach Nonresidential Standards	Jul 29 <u>May 1, 2012</u> [*]
10	Participate in Rulemaking Proceeding	May <u>March 31, 2012</u> [*]
11	Nonresidential Compliance Manuals	May <u>December 31, 2012</u> [*]
12	Contingencies and Additional Topic Areas	Per Work Authorization
13	Contract Management	Monthly throughout the Agreement

* These are dates anticipated for public meetings as applicable. The Contractor shall submit final versions of any relevant documents two weeks prior for posting to the Internet for the public to view.

This is a “work authorization” Agreement and no work shall be undertaken unless authorized by the Energy Commission through a specific written document called a “work authorization.” Each task below lists deliverables. Work authorizations will specify the exact due date for deliverables.

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

The Energy Commission will issue work authorizations for the specific deliverables listed above. In addition, within this broad set of deliverables, the Energy Commission may issue individual work authorizations focused on topics included in the specific task.

Task 1 - Evaluation of the Cost Effectiveness of Solar Electric Systems in Nonresidential Building Standards

Section 3 of Senate Bill 1 (Murray, 2006) requires the Energy Commission to determine whether, and under what conditions, solar electric systems should be required in residential and nonresidential building energy standards. The Energy Commission will complete this determination based, in part, on the work to be completed in this task. The Contractor shall complete an evaluation of the cost effectiveness of solar electric systems for new nonresidential buildings to include, but not be limited to, the following activities:

- Review existing literature on solar electric system valuation,
- Consider costs and benefits amortized over the economic life of the building,
- Determine and justify what types of costs and benefits should be included in the analysis, such as: equipment and installation costs; value of avoided electricity generation, transmission and distribution; value of criteria pollutant, volatile organic compounds (VOC) and carbon dioxide (CO₂) emission reductions (including health benefits); value to the electric system infrastructure (e.g. avoided costs of ancillary services and relative ease and speed of deployment); value of avoided water use; value of increased jobs and economic activity; and other costs and benefits attributable to solar electric systems.
- Consider solar electric system financial incentives including government or utility rebates and tax deductions, and determine the extent of continued availability of these incentives if solar electric systems are required rather than elective,
- Evaluate the characteristics of a nonresidential building project that makes it best suited to solar electric system requirements, such as: size, location (in relation to both solar access and electric system grid benefits), energy usage (level and pattern), construction project type (newly constructed, addition, or alteration), building type and building ownership, and
- Recommend numerical targets for solar electric installations in nonresidential building standards over a range of future years.

The Contractor will document the work completed in this task in a draft Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report. Upon the Commission Contract Manager's review and approval of the draft report, or sooner if appropriate, the Commission Contract Manager and the Contractor shall agree to a date and location for a workshop for public review. The Contractor will present the draft Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report at the workshop and will address issues raised at the workshop in a revised draft Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report. Additional workshop(s) to review the revised draft report will be held if the Commission Contract Manager deems it necessary. The Contractor will address additional measures or issues identified in later workshops or comments if deemed necessary by the Commission Contract Manager. The Contractor will prepare the final Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report.

Deliverables:

- Draft Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report
- Final Cost Effectiveness Analysis for Solar Electric Systems for Nonresidential Building Standards Report

Task 2 - Life Cycle Cost Methodology for the 2011-2013 Standards

The Contractor shall identify, develop and implement a methodology for completing life cycle cost analyses to determine the cost effectiveness of measures for inclusion in the 2011-2013 Standards. The methodology will build on the Life Cycle Cost Methodology done for the 2008 Standards. The methodology shall be capable of evaluating the cost effectiveness of measures both incrementally and in combination. The methodology will document all economic assumptions, periods of analysis, and energy (i.e., electricity, natural gas, and propane) forecasts that are included. The methodology will also include the ability to complete sensitivity or scenario analyses on these and other parameters (e.g., measure performance, measure costs, useful lives, fuel costs, avoided costs of climate change, water costs, and emissions values).

The Contractor will document the proposed life cycle cost methodology in a draft Life Cycle Cost Methodology Report. Upon the Commission Contract Manager's review and approval of the draft Life Cycle Cost Methodology Report, or sooner if appropriate, the Commission Contract Manager and the Contractor shall agree to a date and location for a workshop for public review. The Contractor will present the draft Life Cycle Cost Methodology Report at the workshop and will address issues raised at the workshop in a revised draft Life Cycle Cost Methodology Report. Additional workshop(s) to review the revised draft Life Cycle Cost Methodology Report will be held if the Commission Contract Manager deems it necessary. The Contractor will address additional measures or issues identified in later workshops or comments if deemed necessary by the Commission Contract Manager.

The Contractor will prepare the final Life Cycle Cost Methodology Report. Once the Commission Contract Manager has reviewed and approved the Final Life Cycle Cost

Methodology Report, the Contractor will carry out all of the steps in the approved methodology to complete the life cycle cost analysis of all measures under consideration for the ~~2014~~2013 Nonresidential Standards. This work is included in Task 5 and Task 6. The Commission Contract manager will review and approve the methodology applied to the proposed measures.

Deliverables:

- Draft Life Cycle Cost Methodology Report
- Final Life Cycle Cost Methodology Report

Task 3 – ~~2014~~2013 Standards Nonresidential Measure Identification and Analysis Plan

The Contractor shall identify energy, peak load and water savings opportunities (measures) for nonresidential buildings in collaboration with the Commission Contract Manager. The measures to be considered may include, but are not limited to:

- More energy and/or water efficient levels of the measures currently included in the Standards,
- Measures that are options for compliance in the performance standards but are not required,
- New measures proposed by a stakeholder or the Contractor, and
- Measures that may result from the research or other work on the Key Topic Areas (see the description of Key Topic Areas following these task descriptions).

The Contractor shall:

- Fully describe each identified measure,
- Identify and document performance criteria such as design criteria or compliance with testing standards necessary for the measure to be effective and reliable,
- Identify procedures for verifying the proper installation of the measure,
- Review any relevant technical research and literature and existing testing procedures and standards,
- Describe any modeling changes to the Standards nonresidential reference computer program that will be required to effectively evaluate the measure, and assess the feasibility of completing these modeling changes,
- Consult with Standards stakeholders and industry experts knowledgeable about the measure, and
- Provide an initial determination of whether the measure should be considered for the mandatory standards or the reach standards.

For each identified measure, the Contractor shall include development and documentation of plans for additional information about the measure required for completion of subsequent tasks. For each identified measure, these plans shall identify sources of information relating to:

- Costs,
- Useful lifespan,
- Extent of availability,
- Potential for expanding availability,

- Potential for environmental consequences either positive or negative associated with the use of the measure,
- Energy and demand savings,
- Water savings,
- GHG emission reductions,
- The non-energy implications of the measure that may enhance or detract from its acceptance, such as health and safety implications, impacts on perceived comfort and productivity, or potential to enhance property valuation,
- Issues that require further investigation related to performance criteria, environmental consequences, field verification procedures, or non-energy implications, and
- Ability of the measure to contribute to the short and/or long term strategies required to meet California’s zero net energy goals (see Key Topic Area A.).

The Contractor shall document plans for each measure in a draft Nonresidential Measure Identification and Analysis Plan. This draft will be submitted to the Commission Contract Manager for review and approval. Upon the Commission Contract Manager’s approval of the draft, the Commission Contract Manager and the Contractor shall agree to a date and location for a workshop for public review. The Contractor will present the revised draft Nonresidential Measure Identification and Analysis Plan at the workshop and address issues raised at the workshop in a revised Nonresidential Measure Identification and Analysis Plan. Additional workshop(s) to review the revised draft Measure Identification and Analysis Plan will be held if the Commission Contract Manager deems it necessary. The Contractor will address additional measures or issues identified in later workshops or comments if deemed necessary by the Commission Contract Manager. The Contractor will prepare the final Nonresidential Measure Identification and Analysis Plan.

Deliverables:

- Draft Nonresidential Measure Identification and Analysis Plan
- Final Nonresidential Measure Identification and Analysis Plan

Task 4 – Nonresidential Alternative Calculation Method (ACM)

The Contractor shall work with the Energy Commission leading the projects described in Key Topic Area H to reorganize and modify the information contained in the 2008 Nonresidential ACM Manual to develop the following documents:

- Nonresidential Performance Compliance Rule Set Documentation. This will include documentation of the data dictionary and rule set language developed for use in defining a Title 24 (T-24) rule set. This will also include a description of each compliance rule in the performance standard written in the rule set language.
- Nonresidential Compliance Engine Documentation. This will include a written explanation of the software developed by others for the Energy Commission which accepts a building description and interprets a Title 24 rule set to compute and compare the energy performance of a proposed building with a standard or “budget” building. The documentation will include, but not be limited to:
 - The required format for the building input description,

- Explanation of the data libraries used within the Compliance Engine (e.g. climate zone data, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) design day climatic data, Time Dependent Valuation data, Reference Appendix data),
- An explanation of the functionality of the Compliance Engine, and
- A listing of the information produced as output from the Compliance Engine.
- Nonresidential Compliance Software Specification. This documentation will specify the requirements for compliance software that is developed by others for Energy Commission approval as software that can be used to prove compliance with the Title 24 Nonresidential Standards. The specification will include, but not be limited to:
 - The user interface requirements,
 - The reporting requirements, and
 - The requirements for incorporating a Title 24 rule set or the Compliance Engine (which includes the rule set).
- Compliance Software Certification Procedures. This will document the process used by the Energy Commission to certify compliance software, including the tests and test data that will be used and the requirements of the party submitting the software for certification.

The Contractor shall develop a detailed [20142013](#) Nonresidential ACM Manual Outline based on the above documents and relevant materials from the 2008 nonresidential ACM Manual that will be used when ACM Manual updates are made for the [20142013](#) Standards in Task 8.

The Contractor shall also provide the Research Version of [20142013](#) Nonresidential Standards Reference Program specified by the Energy Commission as the reference program for the [20142013](#) Nonresidential Standards. This reference program shall include any modeling changes recommended in the Task 3 Measure Identification and Analysis Plan. This plan will be reviewed and approved by the Commission Contract Manager. The Contractor shall make modifications to the Title 24 nonresidential Rule Set and the Nonresidential Compliance Engine as necessary to implement the [20142013](#) updates to the Standards.

Background information for this task is included in Key Topic Area H.

Deliverables:

- Nonresidential Performance Compliance Rule Set Documentation
- Nonresidential Compliance Engine Documentation
- Nonresidential Compliance Software Specification
- Nonresidential Compliance Software Certification Procedures
- [20142013](#) Nonresidential ACM Manual Outline
- Research Version of [20142013](#) Nonresidential Standards Reference Program
- [20142013](#) Title 24 Nonresidential Rule Set
- Nonresidential Compliance Engine for the [20142013](#) Standards

Task 5 - Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards

The Contractor shall prepare a Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards. This report shall contain a general description of and life cycle costing and energy analyses for the proposed measures in the ~~2011~~2013 update to the Standards included in the Nonresidential Measure Identification and Analysis Plan (Note that the Mandatory Standards include all components of these Standards, including mandatory, prescriptive and performance requirements). This report shall cover the scope of proposed code changes for the mandatory level of the Standards. The report will include first draft mark-ups in a format to be identified by the Commission Contract Manager of potential language changes to the Standards, and Nonresidential Alternative Calculation Method (ACM) Manual and Reference Appendices for each measure. The Commission Contract Manager may direct the Contractor to separate this work into two or more sequential reports at the draft phase. The draft report(s) will be reviewed and approved by the Commission Contract Manager. The final report shall combine all draft reports into one report that includes all proposed measures.

The Contractor will address issues raised at public workshops or by the Commission Contract Manager in a revised draft report and prepare supplements to the report to address additional measures or issues identified in later workshops or hearings on the proposed ~~2011~~2013 Standards. The Contractor will prepare the final Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards. The Final Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards must also include recommended language changes for the Nonresidential Compliance Manuals.

Deliverables:

- Draft Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards
- Final Life Cycle Costs and Energy Analysis Report for Mandatory Nonresidential Standards

Task 6 - Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards

The Contractor shall prepare a draft Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards. This report shall contain a general description of and life cycle costing and energy analyses for the proposed measures included in the Measure Identification and Analysis Plan (Note that the Reach Standards include all components of these Standards, including mandatory, prescriptive and performance requirements for voluntary levels). This draft report shall cover the scope of proposed code changes for the voluntary or reach level of the Standards. The draft report will include first draft mark-ups in a format to be identified by the Commission Contract Manager of potential language changes to the Standards, Nonresidential Alternative Calculation Method (ACM) Manual; and Reference Appendices for each measure. The Commission Contract Manager may direct the Contractor to separate this work into two

or more sequential reports at the draft phase. The Contractor shall submit the draft report(s) to the Commission Contract Manager for review and approval. The final report shall combine all draft reports into one report that includes all proposed measures.

The Contractor will address issues raised at public workshops or by the Commission Contract Manager in a revised report and prepare supplements to the report to address additional measures or issues identified in later workshops or hearings on the proposed ~~2011~~2013 Standards. The Contractor will prepare the final Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards. The Final Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards must also include recommended language changes for the Residential and Nonresidential Compliance Manuals.

Deliverables:

- Draft Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards
- Final Life Cycle Costs and Energy Analysis Report for Reach Nonresidential Standards

Task 7 - Standards, Reference Appendices, and Nonresidential ACM Manual

A. At the direction of the Commission Contract Manager, the Contractor will draft specific mark-ups to language (building on the Measure Identification and Analysis Plan in Task 3) for revisions to the Standards, Reference Appendices, and Nonresidential ACM Manuals (documents), consistent with the work in Tasks 2-7. The scope of this task covers both the mandatory and the reach levels of the Standards. The Contractor will prepare draft documents that delineate all draft revisions. The Commission Contract Manager will instruct the Contractor as to the format of these documents. Upon the Commission Contract Manager's review and approval of the draft documents, or sooner if the Commission Contract Manager deems it appropriate, the Commission Contract Manager and the Contractor shall agree on a date and location for a workshop for public review. The Contractor will present the draft documents at the workshop. If the Commission Contract Manager deems it necessary, the Contractor will prepare supplements to address additional measures or issues identified in later workshops or hearings on the proposed ~~2011~~2013 Standards. The Contractor will prepare the final documents: ~~2011~~2013 Standards, Reference Appendices, and Nonresidential ACM Manuals.

B. Contractor will initiate development of on-line forms used to comply with Standards

C. To develop the specifications for and plans to collect a suite of acceptable modeling results for specific nonresidential building types, energy systems and efficiency measures for use as the 2013 Nonresidential ACM Reference Method.

Deliverables:

- Three (3) Draft Documents: ~~2011~~2013 Standards, Reference Appendices, and Nonresidential ACM Manual

- Three (3) Final Documents: [2011](#)~~2013~~ Standards, Reference Appendices, and Nonresidential ACM Manual
- [Placeholder](#)

Task 8 - Impact Analysis Report for Mandatory Nonresidential Standards

The Contractor will provide the Commission Contract Manager with a written draft Impact Analysis Report for Mandatory Nonresidential Standards summarizing the statewide energy savings of the mandatory level of the proposed [2011](#)~~2013~~ Standards to the Commission Contract Manager. The Commission Contract Manager will advise the Contractor on the methodology for estimating the statewide energy savings.

After the Commission Contract Manager has reviewed and approved the draft Impact Analysis Report for Mandatory Nonresidential Standards, the Contractor will present it at a designated workshop and will address issues raised at the workshop in a revised draft report; if the Commission Contract Manager deems it necessary. At the Commission Contract Manager's direction, the Contractor will prepare supplements to the draft Impact Analysis Report for Mandatory Nonresidential Standards to address additional measures or issues identified in later workshops or hearings on the proposed [2011](#)~~2013~~ Standards. The Contractor will prepare the final Impact Analysis Report for Nonresidential Mandatory Standards,

Deliverables:

- Draft Impact Analysis Report for Mandatory Nonresidential Standards
- Final Impact Analysis Report for Mandatory Nonresidential Standards

Task 9 - Impact Analysis Report for Reach Nonresidential Standards

The Contractor will provide the Commission Contract Manager with a written draft Impact Analysis Report for Reach Standards summarizing the statewide energy savings of the voluntary or reach level of the proposed [2011](#)~~2013~~ Standards to the Commission Contract Manager. The Commission Contract Manager will advise the Contractor on the methodology for estimating the statewide energy savings.

After the Commission Contract Manager has reviewed and approved the draft Impact Analysis Report for Reach Nonresidential Standards, the Contractor will present it at a designated workshop and will address issues raised at the workshop in a revised report if the Commission Contract Manager deems it necessary. At the Commission Contract Manager's direction, the Contractor will prepare supplements to the draft Impact Analysis Report for Reach Nonresidential Standards to address additional measures or issues identified in later workshops or hearings on the proposed [2011](#)~~2013~~ Standards. The Contractor will prepare the final Impact Analysis Report for Reach Nonresidential Standards,

Deliverables:

- Draft Impact Analysis Report for Reach Nonresidential Standards
- Final Impact Analysis Report for Reach Nonresidential Standards

Task 10 - Participate in Rulemaking Proceeding

The Contractor will participate in rulemaking hearings to support the draft Standards and related documents developed in Tasks 8, 9 and 10. Contractor participation shall include, but may not be limited to:

- The presentation of the life cycle reports and other analyses that are the basis of the draft Standards.

The Commission Contract manager will review and approve the presentation materials before the rulemaking hearing.

Deliverables:

- Participation in Rulemaking Hearings
- Power Point presentation materials

Task 11 - Nonresidential Compliance Manual

The Contractor shall identify any necessary revisions to the Nonresidential Compliance Manual and prepare the draft Manual that contain those revisions. The scope of this task covers both the mandatory and the reach Standards. The Contractor will discuss with and obtain approval from the Commission Contract Manager on how best to incorporate the information on the reach Standards (e.g., a compliance manual supplement vs. a separate manual). With assistance from the Commission Contract Manager, the Contractor shall work with their subcontractors, the utilities' CASE initiative consultants, and other entities who worked on updating the Standards and ACM Manuals to update the Compliance Manual.

The Contractor shall submit the draft manual to the Commission Contract Manager for review and approval. When the Commission Contract Manager has reviewed and approved the draft Nonresidential Compliance Manual, or sooner if the Commission Contract Manager deems it appropriate, the Commission Contract Manager and the Contractor shall agree to a strategy for accepting public comments on the Compliance Manual. This may include one or more public workshop(s) as well as public comments received through mail, emails, and phone calls. The Contractor shall work with the Commission Contract Manager to address these public comments in a revised version of the draft Nonresidential Compliance Manual. The Contractor will prepare the final Nonresidential Compliance Manual.

Deliverables:

- Draft Nonresidential Compliance Manual
- Final Nonresidential Compliance Manual

Task 12 - Contingencies and Additional Topic Areas

The Contractor shall assist with work to review, research, and develop recommendations for ~~2011~~2013 Standards code change proposals initiated by Energy Commission staff but are not included in the Key Topic Areas. The Contractor shall provide technical support to the Energy Commission in determining the statewide costs

and environmental impacts of the proposed ~~2011~~2013 Standards. The Contractor shall provide technical expertise to conduct unexpected research and analytic needs to develop ~~2011~~2013 Standards code change proposals as they arise throughout the Agreement period.

Deliverables:

- Will be defined as needed through Work Authorizations

Task 13 – Contract Management

Monthly Progress Report

The Contractor shall prepare a monthly progress report which summarizes all activities conducted by the Contractor and their subcontractors. This monthly progress report shall include a summary of Agreement expenditures to date. The monthly progress report is due to the Commission Contract Manager within 15 working days after the end of the month. The Commission Contract Manager will specify the report format and the number of copies to be submitted. All monthly progress reports will coincide with the invoice period.

Invoice

The Contractor shall prepare a monthly invoice for all Agreement expenses performed for assigned work authorizations. An advance copy of the invoice shall be sent to the Commission Contract Manager to ensure that all records are included and the invoice is for authorized work. The official invoice is to be submitted to the Commission Accounting Office. The Commission Contract Manager will specify the invoice format.

Program Meetings and Briefings

At the request of the Commission Contract Manager, the Contractor and their 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.

Manage Work Authorizations and Subcontractors

In conjunction with the Commission Contract Manager, the Contractor shall issue Energy Commission prepared work authorizations which define the scope of work, the schedule of deliverables and the project budget to the 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.

Deliverables:

- Monthly Progress Reports
- Invoices – Advance copy
- Written briefings as requested

**Nonresidential Building Energy Efficiency
Standards for ~~2011~~2013**

APPENDIX TO EXHIBIT A

Key Topic Areas

The Energy Commission is seeking to contract with a team of consultants for technical support to revise the 2008 California Nonresidential Building Efficiency Standards for ~~2011~~2013. It will be the responsibility of the Contractor to become thoroughly familiar with each of the following key topic areas that are relevant to the nonresidential building sector, the status of ongoing work in each nonresidential topic area outside this Agreement, and additional work necessary to further develop and evaluate options in each nonresidential topic area for possible inclusion in the ~~2011~~2013 Standards. The Energy Commission staff will help identify outside research on these topic areas.

Through the course of this Agreement, some topic areas will continue to be researched in other contracts or in work sponsored by other stakeholders. It will be the responsibility of the Contractor, working with the Commission Contract Manager, to coordinate with other researchers or stakeholders to stay current on the work in each topic area and to build on that work in carrying out the tasks in this Agreement. Some topic areas may become de-emphasized as the Agreement progresses. The Commission Contract Manager will direct the Contractor regarding the relative priority of topic areas and the necessity for continued work in each topic area during the course of this Agreement.

For all topic areas being addressed for the ~~2011~~2013 Standards, the Contractor must complete the basic tasks described in the Scope of Work. For each identified measure to save energy and/or water, the Contractor shall consider both mandatory and reach levels of Standards change proposals. To complete these tasks, the Contractor will determine to what extent work by others on the Key Topic Areas provides sufficient information that can be used directly to complete the tasks, and to what extent additional research and analysis by the Contractor will be necessary to complete the tasks. The Commission Contract Manager may also identify additional research and analysis that the Contractor will be required to complete. The Commission Contract Manager will approve additional research and analysis to be performed by the Contractor that is necessary to complete each task for each topic area.

The Contractor will include individuals on its team who are knowledgeable about the nonresidential key topic areas. Additional topic areas may be identified by the Energy Commission staff or proposed by the public through workshops, hearings, or other comment avenues. The Commission Contract Manager will direct the Contractor on how to proceed on these additional topic areas. The Commission Contract Manager may direct additional technical expertise be recruited for by the Contractor to address these topic areas or additional topic areas added subsequently. These key topic areas include but are not limited to the following:

- A. Progression to Zero Net Energy Standards**
- B. Reach Standards**

- C. Scenario Analyses for Standards Impacts
- D. Water Efficiency
- E. Greenhouse Gas Performance Standards for Supermarkets
- F. Time Dependent Valuation of Energy, Water and GHG Emissions
- G. Weather Data
- H. Reference Computer Programs and Performance Compliance Rules
- I. Envelope Performance
- J. Ventilation for Indoor Air Quality
- K. Water Heating
- L. HVAC Performance
- M. Roofing System Performance
- N. Ducts & Duct Tape
- O. Design Phase Commissioning
- P. Performance Verification/Acceptance Requirements
- Q. Efficient Design of Laboratories and Data Centers
- R. Occupancy Control Applications
- S. Code Compliance for Large Scale Building Projects
- T. Demand Response
- U. Federal Requirements for State Building Energy Codes
- V. Codes and Standards Enhancement Initiatives
- W. Utility Measurement, Assessment and Evaluation Studies (MA&E)
- X. Feedback on and Refinement of 2008 Standards