

CONTRACT REQUEST FORM (CRF)

CEC-94 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

A) New Agreement 300-15-013 (To be completed by CGL Office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Anthony Ng	51	916-445-5297

C) Contractor's Legal Name	Federal ID Number
ADM Associates, Inc.	94-2564794

D) Title of Project
California Investor-Owned Utility Electricity Load Shapes

E) Term and Amount	Start Date	End Date	Amount
	7/29/2016	3/30/2018	\$ 1,147,406

F) Business Meeting Information			
<input type="checkbox"/> Operational agreement (see CAM Manual for list) to be approved by Executive Director			
<input type="checkbox"/> ARFVTP agreements under \$75K delegated to Executive Director.			
Proposed Business Meeting Date	6/14/2016	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Andrea Gough	Time Needed:	5 minutes
Please select one list serve. EPIC (Electric Program Investment Charge)			

Agenda Item Subject and Description
ADM Associates, Inc. Proposed resolution approving Agreement 300-15-013 with ADM Associates, Inc. for a \$1,147,406 contract to conduct market analysis to characterize existing and future electricity load in the service territories of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company. This information will help overcome technical barriers to achieving California's clean energy goals by providing an accurate assessment of the contributions of clean energy technologies towards reducing peak demand, integrating renewable energy into the grid, and maintaining electricity system reliability as the deployment of clean energy technologies and strategies increases over time. (EPIC Funding) Contact: Andrea Gough. (Staff presentation: 5 minutes).

G) California Environmental Quality Act (CEQA) Compliance
1. Is Agreement considered a "Project" under CEQA? <input checked="" type="checkbox"/> Yes (skip to question 2) <input type="checkbox"/> No (complete the following (PRC 21065 and 14 CCR 15378)): Explain why Agreement is not considered a "Project": Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because
2. If Agreement is considered a "Project" under CEQA: <input checked="" type="checkbox"/> a) Agreement IS exempt. (Attach draft NOE) <input type="checkbox"/> Statutory Exemption. List PRC and/or CCR section number: _____ <input checked="" type="checkbox"/> Categorical Exemption. List CCR section number: <u>Cal. Code Regs., tit 14, § 15306</u> <input type="checkbox"/> Common Sense Exemption. 14 CCR 15061 (b) (3) Explain reason why Agreement is exempt under the above section: Exemption 15306 applies to this project since the work involves basic data collection research, model develop and scenario analysis that do not result in major disturbances to an environmental resource. This project will collect data on energy load, weather, energy price, and other criteria to develop current and project future electric load profiles. A modeling framework will be constructed to develop baseline hourly load profiles and then project the impact of demand-side management strategies on these baseline load profiles. This work will be completed on computers utilizing modeling software and will not involve any physical construction. For these reasons, this work will not result in any significant environmental impact and is therefore exempt under section 15306. <input type="checkbox"/> b) Agreement IS NOT exempt. (Consult with the legal office to determine next steps.) Check all that apply <input type="checkbox"/> Initial Study <input type="checkbox"/> Environmental Impact Report <input type="checkbox"/> Negative Declaration <input type="checkbox"/> Statement of Overriding Considerations <input type="checkbox"/> Mitigated Negative Declaration

CONTRACT REQUEST FORM (CRF)



H) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)				
Legal Company Name:	Budget	SB	MB	DVBE
DAV Energy Solutions, Inc.	\$ 81,490	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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
EPIC	14-15	301.001B	\$ 1,147,406
			\$
			\$
			\$
			\$
			\$
R&D Program Area: EDMFO: EDMF		TOTAL:	\$
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

K) Contractor's Administrator/ Officer				Contractor's Project Manager			
Name:	Sasha Baroiant			Name:	Sasha Baroiant		
Address:	3239 RAMOS CIR			Address:	3239 RAMOS CIR		
City, State, Zip:	SACRAMENTO, CA 95827-2501			City, State, Zip:	SACRAMENTO, CA 95827-2501		
Phone:	916-363-8383 /	Fax:	- -	Phone:	916-363-8383 /	Fax:	- -
E-Mail:	sasha@admenergy.com			E-Mail:	sasha@admenergy.com		

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

Solicitation RFP Solicitation #: RFP-15-322 # of Bids: 5 Low Bid? No Yes

Non Competitive Bid (Attach CEC 96)

Exempt Select Exemption (see instructions)

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:

After careful review of the classifications available within the Energy Commission and other State of California agencies, Energy Commission staff has concluded that the nexus of skills identified in this contract and the RFP from which it resulted, and which are required to provide the deliverables identified in this contract, do not exist within current civil service positions. The RFP sought a contractor with expertise in electricity load forecasting methodology development, collection of load data, load profile development, and varied grid generation and demand scenario analyses. Existing staff has neither the technical knowledge nor the practical experience with electricity loads to carry out this workload. A private contractor, familiar with utilities; markets; grid variables; and consumer behavior patterns, and with a history of experience and a proven track record of delivering the services and products outlined in this contract, is the only option for obtaining the needed deliverables.

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

The rates for personnel to be used in this agreement are lowest among those provided by other private consulting firms that also bid on the solicitation for this project. Additionally, the rates identified in this contract are reasonable because they are comparable with other private firms conducting similar work in energy consulting, based on Energy Commission previous contracting experience and review of similar private-sector work.

s) Disabled Veteran Business Enterprise Program (DVBE)

1. Exempt (Interagency/Other Government Entity)
2. Meets DVBE Requirements DVBE Amount:\$ 81,490.00 DVBE %: 7
 - Contractor is Certified DVBE
 - Contractor is Subcontracting with a DVBE: DAV Energy Solutions, Inc.
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? | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Yes |
| 2. Is the Contractor providing confidential information? | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Yes |
| 3. Is the Contractor going to purchase equipment? | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Yes |
| 4. Check frequency of progress reports
<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> _____ | | |
| 5. Will a final report be required? | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Yes |
| 6. Is the agreement, with amendments, longer than a year? If yes, why? | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Yes |

This project requires complex analytical work that cannot be complete in a satisfactory manner within one year. The work in this contract consists of (1) methodology development, (2) collection of load data, (3) load profile development, and (4) scenario analysis, all of which are highly technical. Sufficient time is required to allow the Contractor to properly plan, collect, and analyze the necessary data for this project, which consists of energy usage data for every hour of the year by multiple end-users (residential homes, commercial buildings, etc.). This represents a huge volume of data that the Contractor must gather, sort, and prepare for use in analysis. Given the recent accessibility to smart meter technology, this type of study has never been done before and both the Expected Level of Effort Table and the Schedule of Deliverables further highlight the time required for each task. For example, Scenario Analysis (Task 6) will take ten months alone and this is merely one factor. Many of the tasks are inter-dependent and so complex that in order to execute all deliverables effectively, substantial time is needed to carry out each step of the project. Once the data is prepared, it can be used to develop energy load profiles which will serve as a baseline for forecasting future energy usage as well as evaluating impacts of different energy policies and strategies. The Contractor will require more than one year to accomplish this highly complex and technical work in a way that will be useful to the Energy Commission.

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

PURPOSE OF THE AGREEMENT

This contract will fund market analysis to characterize existing and future electricity load in the service territories of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company.

KEY WORDS/TERMS

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

Word/Term	Definition
AAEE	Additional Achievable Energy Efficiency
CAM	Commission Agreement Manager, the person designated by the Energy Commission to oversee the performance of an agreement resulting from this contract and to serve as the main point of contact for the Recipient
CAO	Commission Agreement Officer
Contractor	ADM Associates, Inc.
CPUC	California Public Utilities Commission
DSM	Demand Side Management
Energy Commission	California Energy Commission
IOU	Investor-Owned Utility, including Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Edison Co.
Project Manager	The person designated by the contractor to oversee the project and to serve as the main point of contact for the Energy Commission.
State	State of California
TAC	Technical Advisory Committee
WA	Work Authorization

FORMAT/REPORTING REQUIREMENTS

Deliverables/Reports

When creating reports, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Agreement Manager (CAM), the latest version of the Consultant Reports Style Manual published on the Energy Commission's web site:

http://www.energy.ca.gov/contracts/consultant_reports/index.html

Each final deliverable shall be delivered as one original, reproducible, 8 ½" by 11", camera-ready master in black ink. Illustrations and graphs shall be sized to fit an 8 ½" by 11" page and readable if printed in black and white.

Electronic File Format

The Contractor shall deliver an electronic copy (CD ROM or memory stick or as otherwise specified by the CAM) of the full text in a compatible version of Microsoft Word (doc).

The following describes the accepted formats of electronic data and documents provided to the Energy Commission as contract deliverables and establishes the computer platforms, operating systems and software versions that will be required to review and approve all software deliverables.

- 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.

Software Application Development

If this scope of work includes any software application development, including but not limited to databases, websites, models, or modeling tools, contractor shall utilize the following standard Application Architecture components in compatible versions:

- Microsoft ASP.NET framework (version 3.5 and up) Recommend 4.0
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5
- Visual Studio.NET (version 2008 and up) Recommend 2010
- C# Programming Language with Presentation (UI), Business Object and Data Layers
- SQL (Structured Query Language)
- Microsoft SQL Server 2008, Stored Procedures Recommend 2008 R2
- Microsoft SQL Reporting Services Recommend 2008 R2
- XML (external interfaces)

Any exceptions to the Software Application Development requirements above must be approved in writing by the Energy Commission Information Technology Services Branch.

LEVEL OF EFFORT

The table below identifies the total hours that will be expected of the Contractor and the general classifications for each task.

Task-Specific Level of Effort

Task #	Task Name	Level of Effort (Hours)	Level of Effort (% of total contract)	General Classifications for Work by Task
1	Agreement Management	400	5	Administrators
2	Analytic Framework Development	800	10	Engineers, statisticians, modelers, forecasters, scientists, computer programmer
3	Data Gathering	1000	10	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers, database administrators, customer relations representative
4	Baseline Load Profile Development	3333	25	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers
5	Energy Efficiency Load Impact Profiles	1333	10	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers
6	Scenario Analysis	667	5	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers
7	Identification of Research Opportunities	240	3	Engineers, statisticians, data analysts, modelers, forecasters, scientists
8	Training	500	5	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers

Task #	Task Name	Level of Effort (Hours)	Level of Effort (% of total contract)	General Classifications for Work by Task
9	Documentation	667	5	Engineers, statisticians, data analysts, modelers, forecasters, scientists, computer programmers, science writers, administrative managers
10	Evaluation of Benefits of Load Shape Analysis	80	1	Engineers, statisticians, data analytics, modelers, forecasters, scientists, computer programmers, administrative managers
11	Technology/Knowledge Transfer Activities	80	1	Engineers, statisticians, data analytics, modelers, forecasters, scientists, computer programmers, science writers, administrative
12	Project Support (Unanticipated Tasks)	1600	20	All of the above
	Total	10700	100	

ADMINISTRATIVE TASKS

TASK 1- AGREEMENT MANAGEMENT

The Contractor shall manage a team capable of undertaking all work assignments identified in this Scope of Work. For Task 12, no work shall be undertaken unless authorized by the Energy Commission through a specific WA. The CAM will prepare and issue written WAs that define the scope of work, the schedule of deliverables, and the project budget. Final assignment of tasks and maximum payment for individual projects will be described in work authorizations signed by the Contractor and the Energy Commission. Written authorization must be obtained from the Energy Commission before work can begin on any WA.

All project work performed by the Contractor team shall be directed by and coordinated with Energy Commission staff as designated by the CAM. Work performed by the Contractor or its subcontractors beyond the term end date of the contract will not be reimbursed for payment.

Task 1.1 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this contract. The meeting will be held in Sacramento, California and the CAM will designate the specific location, or via Web-Ex or teleconference. The administrative and technical aspects of this Agreement will be discussed at the meeting.

The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the contract;
- Administrative deliverables;

- Project meetings and briefings;
- Match fund documentation (if applicable);
- Permit documentation (if applicable);
- Subcontracts; and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
- An updated Schedule of Deliverables;
- Technical deliverables;
- Progress reports and invoices;
- Final Report;
- Technical Advisory Committee meetings; and
- Any other relevant topics.

The Contractor shall:

- Attend a "kick-off" meeting with the CAM, the Contracts Officer, and a representative of the Accounting Office.
 - The meeting will be held via Web-Ex or teleconference. The Contractor shall include their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the CAM in this meeting. The administrative and technical aspects of this contract will be discussed at the meeting.
- Provide a List of Match Funds, as applicable.
- If necessary, prepare an updated Schedule of Deliverables based on the decisions made in the kick-off meeting.

The CAM shall:

- Arrange the meeting including scheduling the date and time.
- Provide an agenda to all potential meeting participants prior to the kick-off meeting.

Deliverables:

- An Updated Schedule of Deliverables (if applicable)
- A List of Match Funds (if applicable)

Task 1.2 Invoices

The goal of this subtask is to ensure that invoices contain all required information and are submitted in the appropriate format.

The Contractor shall:

- Prepare quarterly invoices for all reimbursable expenses incurred performing work under this Agreement in compliance with the Exhibit B of the Terms and Conditions of the Agreement and in the format provided by the CAM. In addition, each invoice must document and verify:
 - Energy Commission funds received by California-based entities

- Energy Commission funds spent in California (if applicable)
- Match fund expenditures (if applicable)
- Invoices shall be submitted quarterly together with progress reports (subtask 1.3). Invoices must be submitted to the Energy Commission's Accounting Office.

Deliverables:

- Quarterly Invoices

Task 1.3 Quarterly Progress Reports

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

The Contractor shall:

- Prepare progress reports that summarize all Agreement activities conducted by the Contractor and any subcontractors 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 within 15 calendar days after the end of the reporting period. The CAM will provide the format for the progress reports.

Deliverables:

- Quarterly Progress Reports

Task 1.4 Work Authorizations

The goal of this subtask is to develop and manage all technical and budgetary aspects of WAs in accordance with the requirements of this Agreement for work to be performed under Task 12.

The Contractor shall:

- Help prepare WAs in accordance with the contract requirements.
 - The WA format and content shall be specified by the CAM.
 - The WA term end date should be no later than 90 days prior to the termination of the contract. This allows the Contractor time to complete closeout activities for all WAs and to prepare the Final Report.
- Administer WAs.
 - Establish and maintain contractual agreements with entities performing work.
 - Develop a project schedule.
 - Manage subcontractor activities in accordance with the contract terms and conditions.
 - Provide oversight and first-level review of reports and documentation, and comment on the content of deliverables.
 - Review and approve all WA invoices.
 - Provide audit and accounting services for all WAs.
 - Immediately report any significant variances affecting performance of WAs and recommend mitigation actions for consideration by the Energy Commission's Work Authorization Manager (WAM) and CAM. Examples of significant variances include the inability to deliver products by key WA dates, unavailability of key personnel that will effect timely submittal of deliverables, and key technical issues that would require change in scope, budget, redirection of the effort, or discontinuation of the project.

- Coordinate with the CAM to close out completed WAs and remaining unallocated balances.
- Monitor and Track each WA and the Overall Contract
 - Determine the fiscal status of each WA and the overall contract.
 - Prevent accumulation of cost overruns.
 - Determine if each WA is on schedule.
 - Determine whether deliverables have been submitted and accepted.
 - Track the start, progress, and closure of each WA.

Deliverables:

- WAs in a format to be provided by the CAM to include the following but not limited to:
 - Project SOW
 - Project Team
 - Project and Schedule of Deliverables
 - Project Budget

Task 1.5 Manage Subcontractors

The goal of this task is to ensure quality products, to enforce subcontractor Agreement provisions, and in the event of failure of the subcontractor to satisfactorily perform services, recommend solutions to resolve the problem.

The Contractor shall:

- Manage and coordinate subcontractor activities. The Contractor is responsible for the quality of all subcontractor work and the Energy Commission will assign all work to the Contractor. If the Contractor decides to add new subcontractors, they shall 1) comply with the Terms and Conditions of the Agreement, and 2) notify the CAM who will follow the Energy Commission's process for adding or replacing subcontractors.

Task 1.6 Project Meetings and Briefings

The goal of this subtask is to determine whether any modifications must be made to the tasks, products, schedule, or budget. Project meetings provide the opportunity for frank discussions between the Energy Commission and the Contractor. As determined by the CAM, discussions may include project status, challenges, successes, findings, project goals and benefits, recommendations, and final report preparation. Participants will include the CAM and the Contractor, and may include the Commission Agreement Officer (CAO) and any other individuals selected by the CAM to provide support to the Energy Commission.

The Contractor shall:

- Attend or participate in program support and project-related meetings or discussions in person or via WebEx or conference call, as requested by the CAM.
- Respond to e-mails or other written communication requests regarding project management status and issues, as requested by the CAM.
- Prepare meeting notes for each formal meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project, as requested by the CAM.
- Submit the meeting notes to the CAM for review and approval.

Deliverables:

- Responses to written requests on project status.
- Meeting notes for each formal meeting.

Task 1.7 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
 - Technical area expertise;
 - Knowledge of market applications; or
 - Linkages between the Agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the State of California, and provide recommendations as needed to enhance the benefits.

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

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Utility representatives; and
- Members of relevant technical society committees.

The Contractor shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.7.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member to the CAM.

Deliverables:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.8 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Contractor shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

Deliverables:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Task 1.9 Final Report

The goal of this subtask is to prepare a written Final Report that incorporates a comprehensive description of the project and approach, and presents detailed findings and results of the work completed under this Agreement. It must also include a summary of all data collected, technology transfer activities performed during the project, and how the data may be accessed. The Final Report shall be prepared in language easily understood by the public or layperson with a limited technical background.

The Final Report must be completed before the termination date of the Agreement in accordance with the Schedule of Deliverables.

The Final Report shall be a public document. If the Contractor's work on all or part of this project has obtained confidential status from the Energy Commission, then the Contractor must prepare both a public and a confidential version of the Final Report, and the Contractor shall perform the following subtasks for both the public and confidential versions of the Final Report. When creating the Final Report, the Contractor must use a Style Manual provided by the CAM.

Task 1.9.1 Final Report Outline**The Contractor shall:**

- Prepare and submit a draft outline of the Final Report.

- Submit the draft outline of the Final Report to the CAM for review and approval. The CAM will provide written comments to the Contractor on the draft outline. The Contractor shall review the comments and discuss any concerns regarding the recommended changes with the CAM.
- Prepare and submit the final outline of the Final Report, incorporating the CAM's comments.

Deliverables:

- Outline of the Final Report (Draft and Final)

Task 1.9.2 Final Report

The Contractor shall:

- Prepare the draft Final Report for this Agreement in accordance with the approved final report outline.
- Submit the draft Final Report for review and comment. The CAM will provide written comments to the Contractor. The Contractor shall review the comments and discuss any issues with the recommended changes with the CAM.
- Prepare and submit the Final Report, incorporating CAM comments.

Deliverables:

- Final Report (Draft and Final)

Task 1.10 Final Meeting

The goal of this subtask is to discuss closeout of this Agreement and review the project. The meeting will be held in Sacramento, California and the CAM will designate the specific location, or via Web-Ex or teleconference. The administrative and technical aspects of Contract closeout will be discussed at the meeting.

The Contractor shall:

- Meet with Energy Commission staff prior to the term end-date of this Contract. This meeting will be attended by the Contractor Project Manager and the CAM. The CAM will determine any additional appropriate meeting participants. Present findings, conclusions, and recommended next steps (if any) for the Agreement, based on the information included in the Final Report.
- Prepare a written document of meeting agreements and unresolved activities.
- Prepare a schedule for completing the closeout activities for this Agreement, based on determinations made during the meeting.
- Provide ALL Draft and Final written deliverables provided under this Contract on a CD-ROM or USB memory stick, organized by the tasks in the Contract.

Deliverables:

- Written documentation of meeting agreements
- Schedule for completing closeout activities
- CD-ROM or USB memory stick containing ALL draft and final written deliverables provided under this Contract, organized by task

Task 1.11 Match Funds (If applicable)

The goal of this subtask is to ensure that the Contractor obtains any match funds planned for this Contract and applies them to the Contract during the Contract term.

While the costs to obtain and document match funds are not reimbursable under this Contract, the Contractor may spend match funds for this task. The Contractor may only spend match funds during the Contract term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Contractor must obtain any associated commitments before incurring any costs for which the Contractor will request reimbursement.

The Contractor shall:

- If match funds were a part of the Proposal that led to the Energy Commission awarding this Contract, prepare a *Match Funds Status Letter* that documents the match funds committed to this Contract and includes:
 - A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the 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 must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
 - A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at project meetings and briefings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM if receipt of additional match funds is obtained.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Contractor. Reduction of match funds may trigger a project meeting.

Deliverables:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter (if applicable)
- Match Funds Reduction Notification Letter (if applicable)

TECHNICAL TASKS

Products that require a draft version are indicated by marking “(Draft and Final)” after the product name in the “Deliverables” section of the task. If “(Draft and Final)” does not appear after the deliverable name, only a final version of the deliverable is required.

For deliverables that require a draft version:

- Submit all draft products to the CAM for review and comment in accordance with the project schedule. The CAM will provide written comments to the Contractor about the draft deliverable within 15 days of receipt, unless otherwise specified in the task for which the deliverable is required.

- Consider incorporating all CAM comments into the final deliverable. If the Contractor disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final deliverable.
- Submit the revised deliverable and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For deliverables that require a final version only:

- Submit the deliverable to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

Task 2 Analytic Framework Development

The goal of this task is to work with Energy Commission staff to identify and develop critical components of analytic work to be performed in subsequent tasks. Specifically, the work products resulting from this task will serve both as a guideline for and benchmark against which to measure the progress of work performed under Tasks 3 through 7.

The combination of all final deliverables identified in this task may be referred to collectively as the “analytic framework” in subsequent tasks.

This task involves proposing methods for completing analytic work. Any such proposals must not require the purchase of proprietary models either for immediate use or for continuation of the work in future analyses. Instead, any models created or used must be available for Energy Commission staff to re-use in the future without cost. Models also must be transparent and well documented.

The Contractor shall:

- Review Energy Commission peak load forecasting methods and models, current end use load profiles, and prior methods of end-use load profile development.
- Review the most recent California Public Utilities Commission (CPUC) Energy Efficiency Potential and Goals Study.¹
- Review Energy Commission’s methods for developing estimates of additional achievable energy efficiency (AAEE)²
- Review national studies that may provide data or findings specific to California end use load shapes, such as the DOE Office of Energy Efficiency and Renewable Energy’s building simulations.
- Participate in discussions with staff from the CPUC and California ISO, as directed by the Energy Commission, to identify any other data sources or analytic needs that may be relevant to the analytic framework.
- Work with Energy Commission staff to create a *Data Plan* that identifies data requirements relevant to Tasks 4, 5 and 6, such as weather data; electricity prices; hourly electric loads; and typical building and appliance characteristics. The *Data Plan* should at a minimum:

¹ For example, see Navigant, February 2014. *2013 California Energy Efficiency Potential and Goals Study*. <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M088/K661/88661468.PDF>. See <http://www.cpuc.ca.gov/General.aspx?id=2013> for most recent information.

² http://www.energy.ca.gov/2015_energypolicy/documents/2016-01-27_additional_aee.php

- Identify sources, a method, and a schedule for acquiring this data. The Energy Commission will work with utilities to acquire the interval meter data needed to support the proposed analytical work. The Contractor will participate in any data acquisition meetings scheduled and facilitated by the CAM.
- At a minimum, the data to be collected in Task 3 should include the following fields:
 - Account identifier including meter identifier for all meters per account.
 - Street address associated with the meter(s) per account for non-residential accounts. ZIP code associated with the meter(s) per account for residential accounts.
 - For non-residential accounts, the name, North American Industry Classification System and or Standard Industrial Classification code, and contact information associated with the account.
 - Identify the utility baseline zone associated with the account for residential customers.
 - For each meter per account, the sub-hourly electricity usage.
 - For residential accounts, identify if the account is part of a multifamily unit.
 - For residential accounts, identify if the account uses electricity for space heating.
 - Identify the utility tariff associated with each meter per account.
 - Identify if the account participates or has participated in a utility sponsored program such as net metering, energy efficiency, demand response etc. Identify the program(s) and the date participation started for each program.
 - Identify if the account and meter(s) has on-site generation such as photovoltaic. Identify the technology used for on-site generation, electrical generation capacity, and date of operation.
- Consider data required for further disaggregation of loads, and additional fields that may be needed to meet the objectives of this project. These fields would be part of the overall utility distribution system topology. The specific fields to be collected will be determined by the CAM based on the needs of the Energy Commission and other stakeholders.
- Detail storage requirements for data supporting the development of end-use load profiles.
- Detail primary data requirements and sources for the development of hourly end-use load shapes.
- Propose and document, in the *Data Plan*, the procedure for obtaining data.
- Provide detail of any agreements needed to obtain data. To the extent that residential data is acquired, it shall not be collected directly from individuals.
- Detail the hardware and software required to support the implementation of the hourly load shape development. Details shall include:
 - Why proposed hardware and software best meets contract objectives.
 - Software version required to support the implementation of the hourly load shape development.
 - Number and types of software licenses needed.
 - Recommended minimum software training for new staff.

- Hardware specifications, including data storage requirements.
 - Identification of potential issues that the Energy Commission may face when using the proposed hardware and software to implement the hourly load shape development.
- Propose and document, in a *Base Year End Use Load Profile Method*, a method by which data described by the *Data Plan* may be used to develop detailed hourly end-use load profiles: 1) for each end use employed by the Energy Commission's peak demand model; and 2) that reflect technology and end-user consumption patterns in place during the base year. The proposal must, at minimum:
 - Identify the most recent calendar year for which end-user consumption patterns can be accurately reflected by the newly developed load profiles in Task 4 (to be referred to as the "base year" in this and subsequent tasks).
 - Detail how the method will accurately estimate end-use load profiles by utility, forecasting zone, sector, and building type.
 - Detail, for weather-sensitive end uses, how the method will accurately estimate end-use load profiles by climate zone.
 - Describe how load profile projections will account for behind-the-meter photovoltaic (PV), energy storage (ES), and combined heat and power systems (CHP):
 - Propose a methodology for using historical weather data to estimate PV production and simulating PV production for the forecast period including a methodology for reconciling metered PV production data available online and to Energy Commission staff.
 - Detail how this methodology will be used to estimate generation, including decomposing generation between onsite usage and export to the grid, for the existing fleet of PV, ES, and CHP systems and additions forecasted to come online over the forecast period.
 - Describe the format by which load profiles will be provided so that they may interact with the Energy Commission's demand forecasting models.
- Propose and document, in a *Load Profile Projection Method*, a method by which data described in the *Data Plan* may be used to project future hourly load profiles by, at a minimum, utility; forecasting zone; building type; and customer sector for each year through 2030. The proposal should:
 - Detail any further level of disaggregation below utility territory, forecasting zone, building type, and customer sector for which load profiles may be reasonably projected, given data constraints.
 - Describe how load profile projections will account for the impact of emerging demand side management (DSM) activities, trends in technology development, existing or anticipated policy or regulation changes, and other trends, such as patterns in end-user consumption habits.
 - Describe how the method may be used to produce multiple scenarios as a way to assess uncertainties associated with future DSM strategies, technology development, policy, and other emerging trends.
 - Describe the format by which projected future load profiles will be provided so that they may interact with the Energy Commission's demand forecasting models.

- Propose and document, in *Energy Efficiency Load Impact Profile Method*, a method by which data described in the *Data Plan* may be used to develop detailed hourly load impact profiles for categories of energy efficiency measures considered in the CPUC's most recent energy efficiency potential and goals study.³ The proposal should:
 - Detail the measurement categories, customer classes, and geographic boundaries to be employed by the method.
 - Describe how the load impact profiles may be used to produce hourly estimates of demand reduction relative to the Energy Commission's baseline demand forecast resulting from a given AEE scenario.
- Discuss draft deliverables with CAM and incorporate CAM comments into final deliverables.

Deliverables:

- Data Plan (Draft and Final)
- Base Year End Use Load Profile Method (Draft and Final)
- Load Profile Projection Method (Draft and Final)
- Energy Efficiency Load Impact Profile Method (Draft and Final)

Task 3 Data Gathering

The goal of this task is to acquire the data necessary to successfully implement Tasks 4, 5, 6, and 7 consistent with the analytic framework. The data acquired as part of this agreement should be extensive in detail, accurate, submitted timely to the CAM according to the Schedule of Deliverables and Due Dates, and comprehensively inclusive of all information needed to perform the required analysis of characterizing existing and future electricity load service territories of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company..

The Contractor shall:

- Acquire primary data as prescribed by the *Data Plan* developed in Task 2.
- To the extent primary data cannot be obtained, recommend which of the alternative data sources, identified in Task 2, should be acquired. Acquire secondary data as directed by Energy Commission staff.
- Revise the analytic framework if necessary. Revisions shall incorporate any modifications approved by the CAM. This includes:
 - *Data Plan*. This shall include a summary of collected data stored and managed by contractor-owned resources
 - *Base Year End Use Load Profile Method*
 - *Load Profile Projection Method*
 - *Energy Efficiency Load Impact Profile Method*

³ For example, see *2013 California Energy Efficiency Potential and Goals Study*, published by Navigant for the California Public Utilities Commission, files March 03, 2014, and available at <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M088/K661/88661468.PDF>. See <http://www.cpuc.ca.gov/General.aspx?id=2013>.

- Store and manage collected data using contractor-owned resources up until the point at which data is fully transferred to the Energy Commission.
- Transfer collected data to the Energy Commission.

Deliverables:

- Revised *Data Plan*
- Revised Base Year End Use Load Profile Method
- Revised Load Profile Projection Method
- Revised Energy Efficiency Load impact Profile Method
- Collected data prescribed by the Revised Data Plan

Task 4 Baseline Load Profile Development

The goal of this task is to develop hourly load profiles for electric end uses employed by the Energy Commission's peak load forecasting model. This effort will use the data and analytic framework developed in previous tasks. The load profiles developed in this task will serve as direct input for the Energy Commission's peak load forecasting model.

The Contractor shall:

- Prepare relevant data collected in Task 3 for use in Task 4 by identifying and remedying data quality issues.
- Propose and document, in a *Baseline Load Profile Data Quality Issues*, the data quality issues and proposed mitigation steps.
- Using the base year and method identified in the *Base Year End Use Load Profile Method (Final)*, estimate preliminary hourly electric load profiles for utility territories; customer sectors; forecasting zones; building types; and end uses described in the *Data Plan (Final)*.
- Format hourly load profiles as input for the Energy Commission's peak load forecasting models.
- Finalize hourly load profiles after responding to any concerns identified by the CAM. This step may require multiple iterations as staff run the Energy Commission's peak load models to ensure that the newly developed load profiles produce a backcast that is reasonably close to recorded peak load.
- Propose and document, in an *Baseline Load Profile Electric End-Use Hourly Load Profiles*, the preliminary and final hourly load profiles as input for the Energy Commission's peak load forecasting models

Deliverables:

- Baseline Load Profile Data Quality Issues (Draft and Final)
- Baseline Load Profile Electric End-Use Hourly Load Profiles (Preliminary and Final)

Task 5 Energy Efficiency Load Impact Profiles

The goal of this task is to develop hourly load impact profiles for categories of energy efficiency measures considered in the CPUC's most recent Energy Efficiency Potential and Goals Study.⁴ The resulting profiles will allow the Energy Commission to estimate, for any given AAEE scenario, an appropriate reduction to the Energy Commission's demand forecast at every hour of the year. This effort will use the data and analytic framework developed in Tasks 2 and 3 and the baseline end-use hourly load profiles developed in Task 4.

The Contractor shall:

- Prepare relevant data collected in Task 3 and baseline load profiles developed in Task 4 for use in Task 5 by:
 - Describing data quality issues and proposing mitigation steps in *Energy Efficiency Profile Data Quality Issues*
 - Remedying data quality issues after CAM reviews *Energy Efficiency Profile Data Quality Issues* and approves mitigation steps.
- Estimate preliminary hourly electric load impact profiles for categories of energy efficiency measures as prescribed by the analytic framework (see Tasks 2 and 3) and, using those load impact profiles, produce hourly estimates of impacts from each AAEE scenario developed by the Energy Commission.
- Finalize hourly load impact profiles and AAEE impact estimates after responding to any concerns identified by the CAM.
- Prepare and document, in *Energy Efficiency Electric End-Use Hourly Load Profiles*, the preliminary and final load profiles and AAEE impact estimates.

Deliverables:

- Energy Efficiency Profile Data Quality Issues (Draft and Final)
- Energy Efficiency Electric End-Use Hourly Load Profiles (Draft and Final)

Task 6 Scenario Analysis

The goal of this task is to project hourly load profiles, taking into account changes to end-use consumption patterns that may occur as the result of DSM activities and other trends. The work performed under this task will be an implementation of the load shape projection methodology developed in Task 2 and will utilize data, baseline load profiles, and energy efficiency load impact profiles developed in Task 3, Task 4, and Task 5. Any models developed in the implementation must not be proprietary and must be available to the Energy Commission for use in future analyses.

The Contractor shall:

- Prepare relevant data collected in Task 3 for use in Task 6 by identifying and remedying data quality issues. The identified issues and remedies will be documented in *Scenario Data Quality Issues*.

⁴ For example, see Navigant, February 2014. *2013 California Energy Efficiency Potential and Goals Study*. <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M088/K661/88661468.PDF>. See <http://www.cpuc.ca.gov/General.aspx?id=2013> for most recent information.

- Work with Energy Commission staff to identify and document, in a *Scenario Analysis*, DSM activities, trends in technology development, existing or anticipated policy or regulation changes, and other trends. Considerations must include at a minimum:
 - Efficiency measures considered in the CPUC's most recent Energy Efficiency Potential and Goals Study⁵
 - Consultation with Energy Commission technical staff in the Energy Research and Development Division on trends in technology development for energy efficiency.
 - Review of technical trends in U.S. Department of Energy National Laboratory reports or other U.S. Department of Energy Reports on energy efficiency.
 - Any final decisions regarding time-of-use rate structures made as part of the CPUC's R.12-06-013 residential rate setting proceeding.
 - Any utility plans for the strategic deployment of efficiency and distributed generation resources filed with the CPUC as part of the utility's Distribution Resource Plan Proposal⁶ and that could have a localized impact on load shapes.
 - Consultation with Energy Commission technical staff in the Energy Research and Development Division on trends in technology development for distributed generation.
 - Review of technical trends in U.S. Department of Energy National Laboratory reports or other U.S. Department of Energy Reports on distributed generation.
- Work with Energy Commission staff to develop scenarios encompassing multiple policies, trends, and DSM activities that may occur in combination. These findings shall be included in the *Scenario Analysis* document.
- Implement the method described in Task 2 for projecting load profiles for each forecast year up to 2030, accounting for the policies; trends; and DSM activities identified in this task.
- Project hourly load profiles out to year 2030, at the level of disaggregation identified in the analytic framework (see Task 2). For each DSM activity, trend, policy, and scenario identified in this task, a distinct projection should be developed which reflects changes to end use consumption patterns that are expected to result from that DSM activity, trend, technology innovation, or scenario.

Deliverables:

- Scenario Data Quality Issues (Draft and Final)
- Scenario Analysis (Draft and Final)

Task 7 Identification of Research Opportunities

The goal of this task is to use the results of previous tasks to identify benchmarks for ramp rates and other energy product characteristics that preferred resources such as energy efficiency, demand response, distributed and utility-scale renewable generation and energy storage should strive to meet to address anticipated changes in load shapes. This may involve identifying strategies to expand the range of low-cost, low-emission options to integrate wind energy, solar energy, and wide-scale electric vehicle charging in the California ISO balancing area, including strategies and technologies to lower the risk of mid-day overgeneration, balance rapid swings in generation, and lower the late afternoon peak, especially in spring.

⁵ For example, see Navigant, February 2014. *2013 California Energy Efficiency Potential and Goals Study*. <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M088/K661/88661468.PDF>. See <http://www.cpuc.ca.gov/General.aspx?id=2013> for most recent information.

⁶ For more information, see <http://www.cpuc.ca.gov/General.aspx?id=5071>.

The Contractor shall:

- Prepare and document in an *Insights from Load Shape Analysis: Research Opportunities for Clean Energy* report, a summarization of the insights gained from Tasks 3 through 6 on research opportunities to expand the range of low-cost, low-emission options to integrate wind energy; solar energy; and wide-scale electric vehicle charging in the California ISO balancing area, including strategies and technologies to lower the risk of mid-day overgeneration; balance rapid swings in generation; and lower the late afternoon peak, especially in spring.
- Develop *Research Opportunities* presentation
- Present and discuss findings at one or more Public Workshops organized or identified by Energy Commission staff.
- Develop and document in a *Summary of Comments*, written comments from the workshop and recommended responses. Review and consider public comments and recommend, to CAM, responses.

Deliverables:

- Insights from Load Shape Analysis: Research Opportunities for Clean Energy (Draft and Final)
- Research Opportunities Presentation (Draft and Final)
- Summary of Comments (Draft and Final)

Task 8 Training

The goal of this task is to transfer knowledge to Energy Commission staff responsible for ongoing load profile analysis.

The Contractor shall:

- Prepare detailed *Training Material* and *Presentation Material*.
- Conduct one or more live demonstrations, in person; remotely through WebEx; or via another method approved by the CAM, on the use of analytic tools developed in Tasks 4, 5, or 6, such as spreadsheets; databases; models; or other software applications.
- Facilitate one or more classroom style training sessions at either the Energy Commission or a location determined by the Energy Commission staff, covering topics identified by the CAM.

Deliverables:

- Presentation Material (Draft and Final)
- Training Materials (Draft and Final)

Task 9 Documentation

The goal of this task is to prepare technical documentation of the methodology, data sources, and analytic tools used by the contractor in the completion of Tasks 4, 5 and 6. Documentation may leverage the analytic framework developed in Task 2, but should be provided in sufficient detail to allow a third party to replicate the analysis, given similar resources.

The Contractor shall:

- Prepare a *Technical Manual* of the technical elements of all tasks completed under this contract.
- Transfer, via CD, to the Energy Commission fully developed analytic tools used in the completion of Tasks 4, 5 and 6, such as spreadsheets, databases, models, and other software applications, as well as all processed data used as input to these tools. If applicable, also document, in *Computer Code Documentation*, and transfer all computer code used in the development of these tools.
- Participate in one or more pilot demonstration activities, as requested by the CAM, to demonstrate the successful implementation at the Energy Commission of fully-functional analytic tools used in the completion of Tasks 4, 5 and 6.

Deliverables:

- Technical Manual (Draft and Final)
- CD with Analytical Tools (Draft and Final)
- Computer Code Documentation (Draft and Final)

Task 10 Evaluation of Benefits of Load Shape Analysis

The goal of this task is to report the estimated benefits resulting from the final deliverables from this contract.

The Contractor shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Develop a methodology to estimate the benefits of the final deliverables of this contract to IOU ratepayers: The Contractor will describe how the final deliverables of this contract will help achieve these benefits by doing the following:
 - Estimated benefits of high quality information to support the identification and accurate characterization of opportunities for demand-side management including:
 - Energy efficiency
 - Demand response
 - Load shifting
 - Distributed generation, including determination of (1) appropriate sizing of thermal and electrical output of cogeneration, and (2) optimum geographic orientation of solar panels.
 - Estimated benefits of information to support accurate load forecasting to:
 - Avoid unnecessary or insufficient investments in generation, transmission, and distribution capacity in long-term planning.
 - Ensure reliability in day-to-day grid management through improved forecasting of end-use load shapes.
 - Estimate the impact of policies affecting electricity load shapes.
 - Include information to support traditional uses of the electricity load shapes.

- Prepare a summary of electricity load shape research costs. The Contractor will provide an estimate or range of estimates of the likely total cost and cost per unit of obtaining the level of information the Contractor will be proposing.
- Respond to CAM questions regarding responses to the questionnaires.

Deliverables:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire
- Methodology to Estimate Benefits of Electricity Load Shape Analysis (Draft and Final)
- Estimated Research Costs of Electricity Load Shape Analysis (Draft and Final)

Task 11 Technology/Knowledge Transfer Activities

The goal of this task is to develop a plan to make the knowledge gained, and lessons learned available to the public and key decision makers.

The Contractor shall:

- Prepare a draft *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM. Submit draft *Initial Fact Sheet* to CAM for comment.
- Prepare final *Initial Fact Sheet* incorporating CAM feedback.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a draft *Technology/Knowledge Transfer Plan* for CAM review that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
 - A description of the intended use(s) for and users of the project results.
 - Published documents, including date, title, and periodical name.
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
 - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
 - The number of website downloads or public requests for project results.
- Prepare a final *Technology/Knowledge Transfer Plan* incorporating CAM's feedback.
- Conduct technology transfer activities in accordance with the CAM-approved *Technology/Knowledge Transfer Plan*. These activities will be reported in the Progress Reports. Documents shall include the Legal Notice required in the terms and conditions as appropriate. The CAM, as well as Energy Commission legal and media office staff, must review and approve all publications before they are submitted for dissemination.
- Develop draft presentation materials for an Energy Commission-sponsored conference/workshop (at the direction of the CAM) and/or the Final Contract Meeting on the results of the project for CAM's review.
- Develop final presentation materials incorporating CAM's feedback.
- Conduct public workshop with input and direction from CAM.

- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Deliverables:

- Initial Fact Sheet (Draft and Final)
- Technology/Knowledge Transfer Plan (Draft and Final)
- Presentation Materials (Draft and Final)
- Final Project Fact Sheet (Draft and Final)

Task 12 Project Support (Unanticipated Tasks)

This is a Work Authorization Task and no work shall be undertaken unless authorized by the Energy Commission through a specific written document called a Work Authorization. The Contract Agreement Manager (CAM) for this contract will prepare and issue the written Work Authorizations which define the scope of work, the schedule of deliverables and the project budget.

The goal of this task is to support project activities ensuring successful implementation of the contract. Support will be provided through defined work authorizations approved by the CAM.

The Contractor shall:

- Perform work authorization-based tasks to support goals and objectives of this agreement, including technical assessment, analysis, and reports to:
 - Identify research opportunities to expand the range of low-cost, low-emission options to integrate wind energy, solar energy, and wide-scale electric vehicle charging in the California ISO balancing area, including strategies and technologies to lower the risk of mid-day overgeneration, balance rapid swings in generation, and lower the late afternoon peak, especially in spring.
 - Provide end-use load shape characterization of electricity demand from existing energy technologies and end-users.
 - Provide end use load profiles for additional geographic areas and/or forecast zones
 - Analyze how changes in technology mix and end user consumption patterns might impact load shapes over time.
 - Assess how rate designs (such as time-of-use) and other demand response activities might impact load shapes over time.
 - Collect data that enhance end use load shape characterization from sources discovered while addressing Tasks 2 through 9.

SCHEDULE OF DELIVERABLES AND DUE DATES

Task	Deliverable	Due Date
1	Agreement Management	
1.1	<ul style="list-style-type: none"> • Updated schedule of deliverables (if applicable) • A list of Match Funds (if applicable) 	<ul style="list-style-type: none"> • 1 week following the Kick-off meeting • At the Kick-off meeting
1.2	Quarterly Invoices	Quarterly with Progress Reports
1.3	Quarterly Progress Reports	Quarterly with Invoices
1.4	WAs for Task 12	As requested by CAM
1.6	<ul style="list-style-type: none"> • Responses to written requests on project status • Meeting notes 	As requested by CAM
1.7	<ul style="list-style-type: none"> • List of Potential TAC Members • List of TAC Members • Documentation of TAC Member Commitment 	<ul style="list-style-type: none"> • At the Kick-off meeting • 1 week following the finalization of the TAC • 2 weeks following the finalization of the TAC.
1.8	<ul style="list-style-type: none"> • Draft TAC Meeting Schedule • Final TAC Meeting Schedule • Draft TAC Meeting Agendas • Final TAC Meeting Agendas • TAC Meeting Back-up Materials • TAC Meeting Summaries 	<ul style="list-style-type: none"> • 1 week after Kick-off meeting. • 1 week after receipt of approved TAC Members. • 1 week prior to TAC meeting. • 1 day following receipt of CAM edits to draft agenda. • 1 week prior to TAC meeting • 2 days following TAC meeting.
1.9.1	<ul style="list-style-type: none"> • Draft outline of final report • Final outline of final report 	<ul style="list-style-type: none"> • 6 months prior to contract end-date. • 2 days following receipt of CAM approval.
1.9.2	<ul style="list-style-type: none"> • Draft Final Report • Final Report 	<ul style="list-style-type: none"> • 4 months prior to contract end-date. • 2 months prior to contract end-date
1.10	<ul style="list-style-type: none"> • Schedule for completing closeout activities • Written documentation of meeting agreements • CD-ROM or USB memory stick containing all draft and final written deliverables provided under the contract, organized by task. 	<ul style="list-style-type: none"> • 8 months prior to contract end-date • 6 months prior to contract end-date • 2 months prior to contract end-date
1.11	<ul style="list-style-type: none"> • Match Funds Status Letter 	<ul style="list-style-type: none"> • Kick-off Meeting

Task	Deliverable	Due Date
	<ul style="list-style-type: none"> Supplemental Match Funds Notification Letter (if applicable) Match Funds Retention Notification Letter (if applicable) 	<ul style="list-style-type: none"> Within 2 days of receiving notification of additional funds being matched or being reduced (as applicable).
2	Analytic Framework Development	
	<ul style="list-style-type: none"> Draft data plan Final data plan 	<ul style="list-style-type: none"> 4 weeks after Kickoff meeting 6 weeks after Kickoff meeting
	<ul style="list-style-type: none"> Draft proposal for base year end use load profile estimation method Final proposal for base year end use load profile estimation method 	<ul style="list-style-type: none"> 4 weeks after Kickoff meeting 6 weeks after Kickoff meeting
	<ul style="list-style-type: none"> Draft proposal for energy efficiency load impact profile estimation method Final proposal for energy efficiency load impact profile estimation method 	<ul style="list-style-type: none"> 4 weeks after Kickoff meeting 6 weeks after Kickoff meeting
	<ul style="list-style-type: none"> Draft proposal for load profile projection method Final proposal for load profile projection method 	<ul style="list-style-type: none"> 4 weeks after Kickoff meeting 6 weeks after Kickoff meeting
3	Data Gathering	
	Revised analytic framework	11/18/2016 (if applicable)
	Summary of collected data stored and managed by contractor-owned resources prescribed by the (revised) data plan	1/6/2017
	Transfer of collected data prescribed by the (revised) data plan	11/24/2017
4	Baseline Load Profile Development	
	<ul style="list-style-type: none"> Draft description of data issues and proposed mitigation steps Final description of data issues and proposed mitigation steps 	<ul style="list-style-type: none"> 10/21/2016 11/18/2016
	<ul style="list-style-type: none"> Preliminary end-use hourly load profiles Final end-use hourly load profiles 	<ul style="list-style-type: none"> 2/10/2017 3/24/2017
5	Energy Efficiency Load Impact Profiles	
	<ul style="list-style-type: none"> Draft description of data issues and proposed mitigation steps Final description of data issues and proposed mitigation steps 	<ul style="list-style-type: none"> 10/21/2016 11/18/2016

Task	Deliverable	Due Date
	<ul style="list-style-type: none"> Preliminary electric end-use hourly load impact profiles and AAEE impact estimates Final electric end-use hourly load impact profiles and AAEE impact estimates 	<ul style="list-style-type: none"> 5/5/2017 6/16/2017
6	Scenario Analysis	
	<ul style="list-style-type: none"> Draft description of data issues and proposed mitigation steps Final description of data issues and proposed mitigation steps 	<ul style="list-style-type: none"> 10/21/2016 11/18/2016
	<ul style="list-style-type: none"> Draft description of policies, DSM activities, and trends to be analyzed Final description of policies, DSM activities, and trends to be analyzed 	<ul style="list-style-type: none"> 1/13/2017 1/27/2017
	<ul style="list-style-type: none"> Draft description of scenarios Final description of scenarios 	<ul style="list-style-type: none"> 4/21/2017 5/5/2017
	<ul style="list-style-type: none"> Preliminary electric hourly load profile projections Final electric hourly load profile projections 	<ul style="list-style-type: none"> 7/7/2017 8/4/2017
7	Identification of Research Opportunities	
	<ul style="list-style-type: none"> Draft report on Insights from Load Shape Analysis: Research Opportunities for Clean Energy Final report on Insights from Load Shape Analysis: Research Opportunities for Clean Energy, incorporating staff comments 	<ul style="list-style-type: none"> 9/1/2017 11/24/2017
	<ul style="list-style-type: none"> Draft presentation summarizing key points from the draft report Final presentation incorporating comments from staff 	<ul style="list-style-type: none"> 9/1/2017 9/29/2017
	<ul style="list-style-type: none"> Present and discuss findings at a public workshop organized and/or identified by Energy Commission staff 	<ul style="list-style-type: none"> Week of October 2, 2017
	<ul style="list-style-type: none"> Summary of written comments from the workshop and recommended responses for discussion with staff 	<ul style="list-style-type: none"> 11/3/2017

Task	Deliverable	Due Date
8	Training	
	<ul style="list-style-type: none"> • Presentation materials 	<ul style="list-style-type: none"> • Prior to training sessions
	<ul style="list-style-type: none"> • Draft training materials 	<ul style="list-style-type: none"> • As requested
	<ul style="list-style-type: none"> • Final training materials 	<ul style="list-style-type: none"> • As requested
9	Documentation	
	<ul style="list-style-type: none"> • Draft technical manual 	<ul style="list-style-type: none"> • 9/8/2017
	<ul style="list-style-type: none"> • Final technical manual 	<ul style="list-style-type: none"> • 9/29/2017
	<ul style="list-style-type: none"> • Fully developed analytic tools 	<ul style="list-style-type: none"> • 9/29/2017
	<ul style="list-style-type: none"> • Computer code used in the development of analytic tools 	<ul style="list-style-type: none"> • 9/29/2017
	<ul style="list-style-type: none"> • Input data 	<ul style="list-style-type: none"> • 9/29/2017
10	Evaluation of Benefits of Load Shape Analysis	
	<ul style="list-style-type: none"> • Kick-off Meeting Benefits Questionnaire • Mid-term Benefits Questionnaire • Final Meeting Benefits Questionnaire 	<ul style="list-style-type: none"> • Within 10 business days following the Kick-off Meeting. • May 2017 • Within 10 business days following the Final Meeting.
	<ul style="list-style-type: none"> • Draft Methodology to Estimate Load Shape Analysis Benefits • Final Methodology to Estimate Load Shape Analysis Benefits 	<ul style="list-style-type: none"> • Draft Methodology to Estimate Load Shape Analysis Benefits due 2 weeks after Kick-off Meeting • Final due 1 week after receipt of CAM comments
	<ul style="list-style-type: none"> • Draft Estimated Research Costs • Final Estimated Research Costs 	<ul style="list-style-type: none"> • Draft Schedule and Data for Load Shape Analysis Benefits Estimates due 2 weeks after approval of Task 9 deliverables • Final due 1 week after receipt of comments from CAM
11	Technology/Knowledge Transfer Activities	
	<ul style="list-style-type: none"> • Draft Initial Fact Sheet • Final Initial Fact Sheet 	<ul style="list-style-type: none"> • Draft Initial Fact Sheet due 2 business days after Kick-off Meeting • Final due 2 business days after receipt of comments from CAM

Task	Deliverable	Due Date
	<ul style="list-style-type: none"> • Draft Technology/Knowledge Transfer Plan • Final Technology/Knowledge Transfer Plan 	<ul style="list-style-type: none"> • Draft Technology/ Knowledge Transfer Plan due 6 months prior to contract end-date. • Final due 4 months prior to contract end-date.
	<ul style="list-style-type: none"> • Draft Presentation Materials • Final Presentation Materials 	<ul style="list-style-type: none"> • Draft presentation materials due 2 weeks before Final Meeting • Final presentation materials due 3 business days before Final Meeting
	<ul style="list-style-type: none"> • Draft Final Project Fact Sheet • Finalized Final Project Fact Sheet 	<ul style="list-style-type: none"> • Draft Final Project Fact Sheet due 2 business days after Final Meeting • Final due 2 days after receipt of comments from CAM
12	Project Support (Unanticipated Tasks)	
	<ul style="list-style-type: none"> • Deliverables as defined in approved work authorizations 	If applicable

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ADM ASSOCIATES, INC.

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

RESOLVED, that the Energy Commission approves Agreement 300-15-013 with ADM Associates, Inc. for a \$1,147,406 contract to conduct analysis to characterize existing and future electricity load shapes in the service territories of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company. This information will help overcome technical barriers to achieving California's clean energy goals by providing an accurate assessment of the contributions of clean energy technologies in reducing peak demand, integrating renewable energy into the grid, and maintaining electricity system reliability as the development of clean energy technologies and strategies increases over time; 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 June 14, 2016.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat