

CONTRACT AMENDMENT REQUEST FORM (CARF)

CEC-276 (Revised 02/13)

CALIFORNIA ENERGY COMMISSION



Original Agreement #	600-11-005	Amendment #	1
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Division	Agreement Manager:	MS-	Phone
600 Fuels and Transportation Division	Jim McKinney	44	916-654-3999

Contractor's Legal Name	Federal ID Number
The Regents of the University of California, Davis	94-6036494

Revisions: (check all that apply)		
<input type="checkbox"/> Term Extension	New End Date: / /	Include revised schedule and complete items A, B, C, D, & H below.
<input checked="" type="checkbox"/> Budget Augmentation	Amendment Amount: \$ 117,154	Include revised budget and complete items A, B, C, D, E, F, & H below.
<input type="checkbox"/> Budget Reallocation		Include revised budget and complete items A, B, C, D, & H below.
<input checked="" type="checkbox"/> Scope of Work Revision		Include revised scope of work and complete items A, B, C, D, & H below.
<input type="checkbox"/> Change in Project Location or Demonstration Site		Include revised scope of work and complete items A, B, C, D, G, & H below.
<input type="checkbox"/> DVBE Replacement		Include revised scope of work and complete items A, B, C, D, F, & H below.
<input type="checkbox"/> Novation/Name Change of Prime Contractor/Recipient		Include novation documentation and complete items A, C, D, & H below.
<input type="checkbox"/> Terms and Conditions Modification		Include applicable exhibits with bold/underline/strikeout and complete items A, B, C, D, & H below.

A) Business Meeting Information**Business Meeting approval is not required for the following types of Agreements:**

- Operational agreement (see CAM Manual for list) to be approved by Executive Director
- ARFVTP minor amendments delegated to Executive Director.

Proposed Business Meeting Date	08 / 14 / 2013	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Leslie Baroody	Time Needed:	5 minutes

Please select one list serve. Altfuels (AB118- ARFVTP)

Agenda Item Subject and Description

Possible approval of Amendment 1 to Contract 600-11-005 with UC Davis NEXTSTEPS to augment the agreement by \$117,154 for a new total agreement amount of \$2,887,227 to conduct a research study on the Plug-in Hybrid and Electric vehicle (PEV) Dealership Experience. The study will examine the relationship and transactions between new car dealers and owners of PEVs to inform policies for market development of PEVs in the state. The study will achieve the goals of the Governor's Zero-Emission Vehicle (ZEV) Action Plan by encouraging and supporting auto dealers to increase sales and lease of ZEVs, support expanded ZEV education of sales staff, and encourage existing public-private ZEV-focused partnerships to include leaders from the auto dealership sector in their efforts and organizations. (ARFVTP funding)

B) Amendment Justification (For contract amendments only)

- Non Competitive Bid (Attach CEC 96)
- Exempt Interagency

C) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	Budget	SB	MB	DVBE
	\$ 0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$ 0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$ 0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

Legal Company Name:

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E) Budget Information (only include amendment amount information)			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
ARFVTF	12/13	600.118B	\$117,154
Funding Source			\$
R&D Program Area:	Select Program Area	TOTAL:	\$117,154
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

F) Disabled Veteran Business Enterprise Program (DVBE)

- Exempt (Interagency/Other Government Entity)
- Meets DVBE Requirements DVBE Amount:\$ _____ DVBE %: _____
 - Contractor is Certified DVBE
 - Contractor is Subcontracting with a DVBE: Name of DVBE Company
- Contractor selected through CMAS or MSA with no DVBE participation.
- Requesting DVBE Exemption (attach CEC 95)

G) California Environmental Quality Act (CEQA) Compliance

- Is Agreement considered a "Project" under CEQA?
 - Yes (skip to question 2)
 - 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 _____
- If Agreement is considered a "Project" under CEQA:
 - a) Agreement **IS** exempt. (Attach draft NOE)
 - Statutory Exemption. List PRC and/or CCR section number: _____
 - Categorical Exemption. List CCR section number: _____
 - Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section: _____
 - 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	

H) The following items should be attached to this ARF (as applicable)

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

Agreement Manager _____ Date _____ Office Manager _____ Date _____ Deputy Director _____ Date _____

**Exhibit A
SCOPE OF WORK**

TASK LIST

Task #	Task Name
1	Agreement Management
2	Transition Scenarios for Alternative Fuels and Vehicles in California
3	Consumer Behavior and Vehicle Choice: Longitudinal Tracking Study
4	Biofuel Investment Strategies
5	Best Policy and Incentive Strategies
6	Fuel Availability and Choice
7	Technology Training for Transportation Division Staff
8	Low Carbon Options for Non-Light Duty Vehicles (LDVs)
9	Detailed Assessment of Natural Gas as a Transportation Fuel
10	Biorefinery Case Studies for Biofuels Production in California
11	Plug-in hybrid & Electric Vehicle (PEV) Dealership Study

ACRONYMS/GLOSSARY

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

Term/Acronym	Definition
AB 32	Assembly Bill 32: California Global Warming Solutions Act of 2006
ARFVTP	Alternative and Renewable Fuels and Vehicle Technology Program
CBCAM	California Bioenergy Crop Adoption Model
CCM	Commission Contract Manager
Energy Commission	California Energy Commission
Contractor	Regents of the University of California, Davis
CNG	Compressed natural gas
DPR	Department of Pesticide Regulation
GBSM	Geospatial Biorefinery Siting Model
GIS	Geographic information system
LDV	Light duty vehicle
LNG	Liquefied natural gas
NextSTEPS	A four-year (2011-2014) multidisciplinary research consortium that is part of the Institute of Transportation Studies at the University of California, Davis.
STEPS	Sustainable Transportation Energy Pathways

BACKGROUND/PROBLEM STATEMENT

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). The statute, subsequently amended by AB 109 (Núñez, Chapter 313, Statutes of 2008), authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. The Energy Commission has an annual program budget of approximately \$100 million and provides financial support for projects that:

- Develop and improve alternative and renewable low-carbon fuels;
- Optimize alternative and renewable fuels for existing and developing engine technologies;
- Produce alternative and renewable low-carbon fuels in California;
- Decrease, on a full fuel cycle basis, the overall impact and carbon footprint of alternative and renewable fuels and increase sustainability;
- Expand fuel infrastructure, fueling stations, and equipment;
- Improve light-, medium-, and heavy-duty vehicle technologies;
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets;
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors; and
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

To implement the ARFVTP, the Energy Commission annually updates and adopts an Investment Plan. The Investment Plan communicates the Energy Commission's strategic vision and priorities with respect to the development of alternative and renewable fuel and vehicle technologies, and provides an analytic rationale for its funding allocations, particularly those to specific technologies or policy initiatives. The Energy Commission provides the first draft of the proposed Investment Plan each January consistent with the Governor's proposed budget, and adopts the final Investment Plan for the upcoming fiscal year each May, consistent with the Governor's budget revision.

NextSTEPS is a four-year (2011-2014) multidisciplinary research consortium that is part of the Institute of Transportation Studies at the University of California, Davis. NextSTEPS builds upon the Sustainable Transportation Energy Pathway (STEPS) program, which ran from 2007 to 2010. The overarching program goals of the NextSTEPS program are to generate new insights about the transitions to a sustainable transportation energy future, and disseminate that knowledge to decision-makers in the private sector and governmental agencies so that they can make informed technology, investment, and policy choices. The program draws upon research methods from a broad range of academic fields including: vehicle engineering and design, systems analysis and operations research, chemical and mechanical engineering, lifecycle cost and emissions analysis, market research, sociology and anthropology, economics and business strategy, and policy analysis.

Through this project, NextSTEPS will help the Energy Commission to compare the value, benefits, and drawbacks of all types of alternative fuels and fuel uses and further the Energy Commission's goals of promoting and utilizing environmentally responsible fuels and vehicles and reducing greenhouse gas emissions (GHGs) in California. The research on scenarios and transition strategies provided by the NextSTEPS program is critical to informing the Energy Commission's funding allocations and opportunities for the ARFVTP. NextSTEPS is well-positioned to identify and address the technical, operational, logistical, and strategic issues related to the transition to an alternative fuel-based economy. Information and analysis developed from this agreement will be used to inform the development of future ARFVTP Investment Plans.

GOALS / OBJECTIVES OF THE AGREEMENT

The goal of this agreement is to help the Energy Commission to compare the value, benefits, and drawbacks of all types of alternative fuels and fuel uses and further the Energy Commission's goals of promoting and utilizing environmentally responsible fuels and vehicles and reducing GHGs in California.

The objectives of this agreement are to:

- Provide the Energy Commission with two overarching research updates on scenarios and transition strategies of the planned and potential rollouts of alternative vehicles and fuels in California, with a goal of helping inform the Energy Commission's investment decisions for the ARFVTP
- Provide the Energy Commission with critical data on consumer perceptions and use of light-duty alternative vehicles over time, which can be used as input to develop strategies for market growth and infrastructure development
- Provide information and develop scenarios for biofuel investments and deployment in California, to help inform the Energy Commission's work on meeting national and state mandates for low carbon fuels
- Advise the Energy Commission on possible policy tools to address ARFVTP goals and to spur the successful early stage development of alternative vehicles and fuels
- Inform the Energy Commission on the role of refueling and recharging infrastructure scenarios in driving consumer behavior and adoption of alternative vehicles (e.g., electric vehicles (EV), plug-in hybrid electric vehicles (PHEVs), and biofuel vehicles) in California
- Provide two training workshops to Energy Commission staff to build technology awareness and expertise on alternative transportation fuels and vehicles
- Assess low carbon options for all non-light duty vehicle (LDV) subsectors (e.g., trucks, buses, rail, marine, and aviation), to help the Energy Commission's deliberations in addressing ARFVTP goals for non-LDV subsectors.
- Provide the Energy Commission with a detailed assessment of natural gas – including CNG, LNG, propane, and biogas – as a transportation fuel in California.
- Provide the Energy Commission with case studies of potential biomass feedstock sources in California

FORMAT/REPORTING REQUIREMENTS

Deliverables/Reports

When creating reports, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager (CCM), 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 CCM) 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 Electronic File Format requirements above must be approved in writing by the Energy Commission Information Technology Services Branch.

TASK 1- AGREEMENT MANAGEMENT

Task 1.1 Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement.

The Contractor shall:

- Attend a “kick-off” meeting with the CCM, the Contracts Officer, and a representative of the Accounting Office. The meeting will be held in Sacramento, CA and the CCM will designate the specific location. The Contractor shall include their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the CCM in this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting.
- If necessary, prepare an updated Schedule of Deliverables based on the decisions made in the kick-off meeting.

The CCM 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)

Task 1.2 Invoices

The Contractor shall:

- Prepare 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. Invoices shall be submitted with the same frequency as progress reports (task 1.4). Invoices must be submitted to the Energy Commission’s Accounting Office.

Deliverables:

- Invoices

Task 1.3 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 solution 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 CCM who will follow the Energy Commission’s process for adding or replacing subcontractors.

Task 1.4 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 which summarize all Agreement activities conducted by the Contractor for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due within 15 calendar days after the end of the reporting period. The CCM will provide the format for the progress reports.

Deliverables:

- Quarterly Progress Reports

Task 1.5 Final Report

The goal of this task is to prepare a comprehensive written Final Report that describes the original purpose, approach, results and conclusions of the work completed under this Agreement. 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 has obtained confidential status from the Energy Commission and will be preparing both a public and a confidential version of the Final Report, the Contractor shall perform the following subtasks for both the public and confidential versions of the Final Report.

Task 1.5.1 Final Report Outline

The Contractor shall:

- Prepare and submit a draft outline of the Final Report for review and approval. The CCM will provide written comments to the Contractor on the draft outline. The Contractor shall review the comments and discuss any issues with the recommended changes with the CCM.
- Prepare and submit the final outline of the Final Report, incorporating CCM comments.

Deliverables:

- Draft Outline of the Final Report
- Final Outline of the Final Report

Task 1.5.2 Final Report

The Contractor shall:

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

Deliverables:

- Draft Final Report
- Final Report

Task 1.6 Final Meeting

The goal of this task is to discuss closeout of this Agreement and review the project.

The Contractor shall:

- Meet with Energy Commission staff prior to the term end date of this Agreement. The meeting will be held in Sacramento, CA and the CCM will designate the specific location. This meeting will be attended by the Contractor Project Manager and the CCM. The CCM will determine any additional appropriate meeting participants. The administrative and technical aspects of Agreement closeout will be discussed at the meeting.
- 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 within the meeting.

Deliverables:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.7 Identify and Obtain Required Permits

The goal of this task is to verify all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. While the budget for this task will be zero dollars, the Contractor may show match funds for this task. Permits must be identified in writing and obtained before the Contractor can incur any costs related to the use of the permits for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it at least 2 working days prior to the kick-off meeting. Provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - A schedule the Contractor will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting. The implications to the Agreement if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in the progress reports.

- If during the course of the Agreement additional permits become necessary, then provide the appropriate information on each permit and an updated schedule to the CCM.
- As permits are obtained, send a copy of each approved permit to the CCM if requested.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CCM within 5 working days.

Deliverables:

- A letter documenting the permits and schedule
- Updated list of permits and schedule (as necessary)
- A copy of each approved permit (if requested)

Task 1.8 Conduct Research Update Meetings

The goal of this task is to conduct a First Research Update Meeting and a Final Research Update Meeting between the NextSTEPS management team and Energy Commission staff to discuss the progress and/or results of research performed.

The Contractor shall:

For the First Research Update Meeting:

- Prepare and submit a progress report to the CCM. The progress report shall include, but not be limited to, the following:
 - a summary of all research performed to date
 - detailed information derived from preliminary research results that is relevant to Energy Commission staff, so that they can make informed Investment Plan allocation decisions
 - descriptions of the research approaches used
- Conduct a meeting with Energy Commission Staff to:
 - present the preliminary results of research performed to date
 - present information relevant to the Energy Commission for Investment Plan funding allocations based on preliminary research results
- Prepare and submit a research update meeting summary to the CCM, which shall include a summary of items discussed at the research update meeting

For the Final Research Update Meeting, which will be conducted as part of the Task 1.6 Final Meeting:

- Prepare and submit a Final Report to the CCM (see Task 1.5 for details)
- Conduct a meeting with Energy Commission Staff to:
 - present the results of research performed
 - present detailed information derived from final research results that is relevant to Energy Commission staff, so that they can make informed Investment Plan allocation decisions
- Prepare and submit a research update meeting summary to the CCM, which shall include a summary of items discussed at the research update meeting

Deliverables:

- First Research Update Progress Report
- First Research Update Meeting Summary
- Final Research Update Meeting Summary

TECHNICAL TASKS

Task 2. Transition Scenarios for Alternative Fuels and Vehicles in California

The goal of this task is to provide the Energy Commission with two overarching research updates on scenarios and transition strategies of the planned and potential rollouts of alternative vehicles and fuels in California, in order to help inform the Energy Commission's investment decisions.

The Contractor shall:

- Complete a Transition Scenarios for Alternative Fuels and Vehicles study, to include the following:
 - Identify, analyze, and compare transition issues for alternative fuel and vehicle pathways, including biofuels, electricity, natural gas, propane and hydrogen.
 - Develop integrated "portfolio" strategies that combine energy efficiency and diverse types of low carbon fuels and vehicles to meet GHG reduction goals.
 - Characterize the design of fuel supply chains for different alternative fuels in California, and estimate the investments needed, from the different stakeholders, for each pathway.
 - Develop scenarios for public funding supporting the implementation of specific alternative fuels and vehicles.
 - Identify current and foreseeable barriers to the rate of deployment of each pathway.
 - Identify the risks, values, and tradeoffs of each pathway.
 - Determine the ideal scenario "mixes" for alternative fuel and vehicle pathways – hydrogen/fuel cells, electricity, biofuels, propane, natural gas (from renewable or non-renewable sources), and fossil fuels – in all regions of California.
 - Determine, through a portfolio approach, how different fueling infrastructures complement or compete with each other.
 - Analyze how the future displacement of petroleum is expected to vary over time.
 - Analyze how future GHG emissions are expected to vary over time.
 - Analyze infrastructure deployments for first generation biofuels, such as E85 and biodiesel, to understand how they mesh with a longer term strategy incorporating advanced biofuels.
 - Analyze the needs for fast charging networks for EVs.
- Prepare and submit a draft Transition Scenarios report which shall include the results of the Transition Scenarios for Alternative Fuels and Vehicles study.
- Prepare and submit a final Transition Scenarios Report, addressing comments from the CCM.

Deliverables:

- Draft Transition Scenarios Report
- Final Transition Scenarios Report

Task 3. Consumer Behavior and Vehicle Choice: Longitudinal Tracking Study

The goal of this task is to provide the Energy Commission with critical data on consumer perceptions and use of light-duty alternative vehicles over time, which can be used as input to develop strategies for market growth and infrastructure development. Ultimately, the management tools recommended by this study will inform the Commission's mission to forecast transportation fuel demand, retail fuel prices, and shifts in fuel types and vehicle types.

The Contractor shall:

- Develop a longitudinal survey that includes:
 - a sampling design that combines a modified panel and a repeated cross-section
 - the approach of engaging consumers in design processes
- Deploy the longitudinal survey to:
 - measure consumers' changing awareness, knowledge, consideration, purchase, and use of alternative vehicles and fuels over time
 - engage consumers in the process of designing these future mobility systems
 - test the attractiveness and efficacy of incentives, information campaigns, infrastructure designs, pricing strategies, and other state and federal policy tools to manage transitions to non-petroleum based fuels.
- Prepare and submit a draft Consumer Behavior Report which shall include the results of the longitudinal survey.
- Prepare and submit a final Consumer Behavior Report, addressing comments from the CCM.

Deliverables:

- Draft Consumer Behavior Report
- Final Consumer Behavior Report

Task 4. Biofuel Investment Strategies

The goal of this task is to provide information and develop scenarios for biofuel investments and deployment in California, to help inform the Energy Commission's investments and policies to help California meet national and state mandates for low carbon fuels.

The Contractor shall:

- Complete a Biofuel Investment Strategies study to include the following:
 - Assess biofuels production and use in California and nationally, including first generation and advanced liquid biofuels and biogas.
 - Develop insights for understanding investment paths for biofuels.
 - Analyze and compare how biomass is used in the energy economy, in particular for power generation, heating or to make biofuels.
 - Develop technology learning curves and project development timelines associated with biofuel production and delivery.
 - Compare different technologies and sources for biofuels.
 - Analyze biomass and biofuel pathways and conduct a technology assessment of drop-in biofuels.
 - Examine the factors that affect biofuels investment decisions, measure carbon credit effects on firm-level cash flows, research financing options, and design policies that incentivize the optimal investment paths for biofuels.
- Prepare and submit a draft Biofuel Investment Strategies Report, which shall include the results of the Biofuel Investment Strategies study.

- Prepare and submit a final Biofuel Investment Strategies Report, addressing the comments from the CCM.

Deliverables:

- Draft Biofuel Investment Strategies Report
- Final Biofuel Investment Strategies Report

Task 5. Best Policy and Incentive Strategies

The goal of this task is to advise the Energy Commission on possible policy tools to address ARFVTP goals and to spur the successful early stage development of alternative vehicles and fuels.

The Contractor shall:

- Complete a Best Policy and Incentive Strategies study, which shall include the following:
 - Determine which policy levers matter in incentivizing alternative fuel and vehicle purchasing in upcoming years.
 - Analyze the decision-making of automakers and consumers over time.
 - Identify which policy incentives and programs influence consumer and automaker decisions on new advanced technologies and remain most critical over time.
 - Assess how incentives could be phased out over time.
- Prepare and submit a draft Best Policy and Incentive Strategies Report, which shall include the results of the Best Policy and Incentive Strategies study.
- Prepare and submit a final Best Policy and Incentive Strategies Report, addressing the comments from the CCM.

Deliverables:

- Draft Best Policy and Incentive Strategies Report
- Final Best Policy and Incentive Strategies Report

Task 6. Fuel Availability and Choice

The goal of this task is to inform the Energy Commission on the role of refueling and recharging infrastructure scenarios in driving consumer behavior and adoption of alternative vehicles (e.g., EVs, PHEVs, natural gas, biofuel, and natural gas vehicles) in California.

The Contractor shall:

- Complete a Fuel Availability and Choice study by developing and deploying a small-sample study of drivers and non-drivers of a variety of on-road alternative fuel vehicles (EVs, PHEVs, and biofuel vehicles) which shall explore the ramifications for marketability of different types of alternative fuel vehicles. At a minimum, the following two methods shall be used:
 - Collect refueling/recharging diaries and conduct detailed interviews of at least 15 and up to 25 people for at least three different vehicle types in order to develop rules for optimal infrastructure development.
 - Conduct three workshops (one for each vehicle type) for up to 20 people each to gather information on the effect of refueling infrastructure on consumer choice, consumer solutions to overcoming limited refueling barriers, and other information relevant to this task. The workshops will engage alternative fuel vehicle consumers with consumers who do not have these experiences, producing:

- understandings of whether and how the experiences of alternative fuel vehicles can be conveyed to drivers of conventional vehicles
 - designs of fueling/charging infrastructures that address the aspirations of experienced drivers and the concerns of inexperienced households.
- Prepare and Submit a draft Fuel Availability and Choice Report, which shall report the results of the Fuel Availability and Choice study.
- Prepare and submit a final Fuel Availability and Choice Report, addressing comments from the CCM.

Deliverables:

- Draft Fuel Availability and Choice Report
- Final Fuel Availability and Choice Report

Task 7. Technology Training for Transportation Division Staff

The goal of this task is to provide two training workshops for up to 50 Energy Commission staff members to build technology awareness and expertise on alternative transportation fuels and vehicles.

The Contractor shall:

- Host a one-day workshop and another half-day workshop for Energy Commission staff. The time and location of the workshops shall be chosen in consultation with Energy Commission staff. The workshops shall, at a minimum, include presentations on the latest research related to the adoption of alternative and renewable fuels and vehicle technologies.
- Prepare and submit a draft workshop agenda for each workshop.
- Prepare and submit a copy of workshop training materials
- Prepare and submit a final workshop agenda for each workshop, incorporating comments from the CCM.

Deliverables:

- Draft Workshop agendas
- Workshop training materials
- Final Workshop agendas

Task 8. Low Carbon Options for Non-Light Duty Vehicle (LDV) Subsectors

The goal of this task is to assess low carbon options for all non-light duty vehicle (LDV) subsectors (e.g., trucks, buses, rail, marine, and aviation), to help the Energy Commission's deliberations in addressing ARFVTP goals for non-LDV transportation sub-sectors.

The Contractor shall:

- Complete a Low Carbon Options for non-LDV Subsectors study which shall include the following:
 - Assess low carbon options available for non-LDV transport subsectors, focusing on medium- and heavy-duty trucks, rail, marine, and aviation. Fuel options studied will include biofuels, compressed natural gas (CNG)/liquefied natural gas (LNG), electricity, and hydrogen
 - Analyze technology status, cost, performance, and well-to-wheel GHGs.
 - Examine scenarios (including increased use of biofuels, CNG/LNG, electricity, and hydrogen) out to 2050 for non-LDV transportation GHGs in California.

- Prepare and submit a draft Low Carbon Options for non-LDV Subsectors Report, which shall include the results of the Low Carbon Options for non-LDV Subsectors study.
- Prepare and submit a final Low Carbon Options for non-LDV Subsectors Report, addressing comments from CCM.

Deliverables:

- Draft Low Carbon Options for non-LDV Subsectors Report
- Final Low Carbon Options for non-LDV Subsectors Report

Task 9. Detailed Assessment of Natural Gas as a Transportation Fuel

The goal of this task is to provide the Energy Commission with a detailed assessment of natural gas - including CNG, LNG, propane, and biogas - as a transportation fuel in California. This assessment will help the Energy Commission to estimate natural gas demand as a transportation fuel under various scenarios.

The Contractor shall:

- Develop and conduct a Natural Gas Vehicle Modeling Study to better understand different high efficiency options for using natural gas in light duty, medium duty, and heavy duty vehicles, including biogas. The vehicle modeling study shall include the following:
 - Review CNG and LNG engine models and formulate hybrid vehicle simulations.
 - Assess CNG and LNG storage on board the vehicle and compare to storage of hydrogen.
 - Simulate hybrid vehicles using CNG and LNG and compare with gasoline simulations.
 - Compare economics of CNG and LNG and gasoline or diesel fueled vehicles.
 - Develop scenarios for natural gas transportation infrastructure development, including costs and stakeholder analysis. Assess who might provide the infrastructure investment and how much it would cost.
 - Discuss potential supplies of natural gas in California, including unconventional gas and biogas
 - Assess sustainability and carbon intensity issues with natural gas produced from hydraulic fracturing.
 - Use energy-economic models of California to analyze the role of natural gas in different transportation applications and throughout the energy economy (electricity generation, industry and buildings as well as for transportation).
 - Examine whether the present interest in CNG (and resurging interest in LNG) is likely to persist in the long term or serve as a “bridge” to renewable fuel (excluding NG) vehicles or hydrogen vehicles.
 - Determine and compare the costs of transitional and long-term use of natural gas.
 - Assess natural gas’s role in meeting the State’s low carbon fuel standard.
- Prepare and submit a draft Natural Gas Vehicle Modeling Study report, which shall include the results of the Natural Gas Vehicle Modeling Study.
- Prepare and submit a final Natural Gas Vehicle Modeling Study Report, addressing comments from the CCM.

Deliverables:

- Draft Natural Gas Vehicle Modeling Study Report
- Final Natural Gas Vehicle Modeling Study Report

Task 10. Biorefinery Case Studies for Biofuels Production in California

The goal of this task is to provide the Energy Commission with case studies of potential biomass feedstock sources in California. Case studies will be suggested by Energy Commission, suggested by potential biomass businesses in California, or indicated by important potential policy changes affecting biomass energy in California or at the federal level. Final selection of case studies must be approved by the Energy Commission CCM.

The Contractor shall:

- Analyze current Department of Pesticide Regulation (DPR) crop choice data, using cluster analysis techniques.
- Update costs and prices in UC Davis's California Bioenergy Crop Adoption Model (CBCAM) and feedstock and infrastructure data for the open, multi-stakeholder Geospatial Biorefinery Siting Model (GBSM). (Note: both models are available to the public and are housed at UC Davis.
- Carry out specific feedstock and/or location-specific analyses of potential biomass feedstock sources in California.
- Update the California biomass resource and infrastructure data and acquire technology-specific performance data for the case studies.
- Integrate the CBCAM and GBSM with each other.
- Evaluate the role of different types and scales of feedstock transformation technologies in promoting the use of diverse biomass sources to produce fuel and power in California.
- Compare both centralized and distributed biorefinery models and technologies as specified by the CCM.
- Prepare and submit a draft Biorefinery Case Study Report, which shall include the results from the work conducted under this task.
- Prepare and submit a final Biorefinery Case Study Report, addressing comments from the CCM.

Deliverables:

- Draft Biorefinery Case Study Report
- Final Biorefinery Case Study Report

Task 11. Plug-in hybrid & Electric Vehicle (PEV) Dealership Study

The goal of this task is to inform the Energy Commission on the role of new car dealerships in the development of a market for PEVs. New car dealerships, which interface directly with customers, could play a key role in the market development of PEVs and other Zero Emission Vehicles (ZEVs). Yet dealership practices are not well understood. The study aims to understand the business drivers affecting dealer participation in PEV sales, the impact of incentive policies and programs on consumer demand vis-à-vis dealership business practices, and to assess the potential for dealerships to contribute to PEV market growth. Ultimately, the study aims to identify a set of targeted policies for aligning incentive policies and programs with dealer-level incentives to engage dealerships in activities crucial for development of a growth market for ZEVs in the state.

The Contractor shall:

- **Complete a Dealership Experience and Best Practices study, which shall include the following:**

- An innovation system-level analysis that examines the role of California new car dealerships in the PEV market
 - Capture opinions and attitudes toward the dealership experience related to the purchase or lease of PEVs from the perspective of new car dealers and consumers
 - Identify the set of activities for growing the PEV market that are relevant to dealerships and assess the extent to which dealerships are participating in these activities
 - Identify 'dealer innovators' and methods and attributes that support promulgation of best practices
 - Identify key policy issues and develop targeted policy interventions to align and encourage effective dealer participation in PEV market development
 - Conduct a final workshop comprised of representatives of new car dealers statewide
 - Prepare and submit a draft PEV Dealership Study Report
- Deliverables:
- Draft PEV Dealership Study Report
 - Final PEV Dealership Study Report

SCHEDULE OF DELIVERABLES AND DUE DATES

Task Number	Deliverable	Due Date
1		
1.1	An Updated Schedule of Deliverables	If applicable
1.2	Invoices	Quarterly
1.4	Quarterly Progress Reports	Quarterly
1.5.1	Draft Outline of the Final Report Final Outline of the Final Report	May 1, 2014 June 1, 2014
1.5.2	Draft Final Report Final Report	July 1, 2014 July 30, 2014
1.6	Written documentation of meeting agreements Schedule for completing closeout activities	September 15, 2014 September 15, 2014
1.7	A letter documenting the permits and schedule Updated list of permits and schedule A copy of each approved permit (if requested)	September 1, 2012 As necessary As requested
1.8	First Research Update Progress Report	June 1, 2013
	First Research Update Meeting Summary	July 1, 2013
	Final Research Update Meeting Summary	July 1, 2014
2		
	Draft Transition Scenarios Report	May 1, 2014
	Final Transition Scenarios Report	June 1, 2014
3		
	Draft Consumer Behavior Report	May 1, 2014
	Final Consumer Behavior Report	June 1, 2014
4		
	Draft Biofuel Investment Strategies Report	May 1, 2014
	Final Biofuel Investment Strategies Report	June 1, 2014
5		
	Draft Best Policy and Incentive Strategies Report	May 1, 2014
	Final Best Policy and Incentive Strategies Report	June 1, 2014
6		

	Draft Fuel Availability and Choice Report	May 1, 2014
	Final Fuel Availability and Choice Report	June 1, 2014
7		
	Draft Workshop Agenda (First Workshop)	September 1, 2012
	Final Workshop Agenda (First Workshop)	September 15, 2012
	Workshop Materials (First Workshop)	September 30, 2012
	Draft Workshop Agenda (Second Workshop)	September 1, 2012
	Final Workshop Agenda (Second Workshop)	September 15, 2012
	Workshop Materials (Second Workshop)	October 30, 2012
8		
	Draft Low Carbon Options for non-LDV Subsectors Report	May 1, 2014
	Final Low Carbon Options for non-LDF Subsectors Report	June 1, 2014
9		
	Draft Natural Gas Vehicle Modeling Study Report	May 1, 2014
	Final Natural Gas Vehicle Modeling Study Report	June 1, 2014
10		
	Draft Biorefinery Case Study Report	May 1, 2014
	Final Biorefinery Case Study Report	June 1, 2014
11		
	<u>Draft PEV Dealership Study Report</u>	<u>February 28, 2014</u>
	<u>Final PEV Dealership Study Report</u>	<u>March 31, 2014</u>