

## CONTRACT REQUESTS FOR QUOTE (CRF)

CEC-94 (Revised 5/11)

CALIFORNIA ENERGY COMMISSION


 New Contract 2010-11-003  Amendment to Existing Contract: \_\_\_\_\_ Amendment Number: \_\_\_\_\_

Division	Contract Manager:	MS-	Phone	CM Training Date
Fuels and Transportation	John Mathias	43	916-327-2381	10/18/2007

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

Title of Project
NextSTEPS (Sustainable Transportation Energy Pathways) Inst. of Transportation Studies, University of California

Term	Start Date	End Date	Amount
New/Original Contract	6/29/2012	12/31/2014	\$ 2,770,072

Line up the Amendment information as best as possible within the following table.

Amendment #	End Date (mm/dd/yy)	Amount

#### Business Meeting Information

Proposed Business Meeting Date	6/13/2012	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	John Mathias	Time Needed:	5 minutes

#### Agenda Item Subject and Description

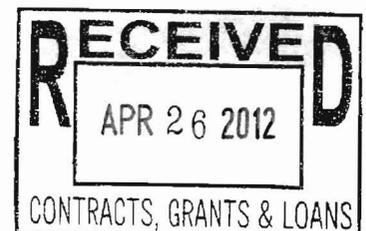
Possible approval of contract with The Regents of the University of California, Davis to conduct research comparing the value, benefits, and drawbacks of all types of alternative fuel uses in California, including updates on rollout scenarios and transition strategies, research on consumer perceptions, research on biofuel investment and deployment scenarios, assessment of low carbon options for the light duty vehicle sector, an assessment of natural gas as a transportation fuel, and development of case studies of potential biomass feedstock sources in California. (ARFVTP funding) Contact: John Mathias.

**Business Meeting approval is not required for the following types of contracts:** *Executive Director's signature is required in all cases.*

- Contracts less than \$10k (*Policy Committee's signature is also required*)
- Amendment for a no-cost time extension. Must be first extension, less than one year and original contract less than \$100k.
- Contracts less than \$25k for Expert Witness in Energy Facility licensing cases and amendments.

#### Purpose of Contract or Purpose of Amendment, if applicable

Through this project, the UC Davis NextSTEPS program will provide the Energy Commission with information to compare the value, benefits, and drawbacks of all types of alternative fuel uses and further the Commission's goals of promoting and utilizing environmentally responsible fuels and vehicles and reducing GHGs in California.





**California Environmental Quality Act (CEQA) Compliance**

1. Is Contract considered a "Project" under CEQA?  
 Yes: skip to question 2  No: complete the following (PRC 21065 and 14 CCR 15378):  
 Explain why contract is not considered a "Project":  
 Contract will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because .

2. If contract is considered a "Project" under CEQA:  
 a) Contract **IS** exempt. (Draft NOE required)  
 Statutory Exemption. List PRC and/or CCR section number: PRC 21102, 21150; 14 CCR 15262  
 Categorical Exemption. List CCR section number: \_\_\_\_\_  
 Common Sense Exemption. 14 CCR 15061 (b) (3)  
 Explain reason why contract is exempt under the above section:  
 Feasibility or planning studies for possible future actions that the agency has not approved, adopted, or funded.  
 b) Contract **IS NOT** exempt. The Contract Manager needs to consult with the Energy Commission attorney assigned to their division and the Siting Office regarding a possible Initial Study.

**Budgets Information**

Contract Amount Funded		Breakdown by FY			Funding Sources			
Funding Source	Amount	FY	Amount	Approved?	Funding Source	FY	Budget List No.	Amount
ARFVTF	2,770,072.24 \$	10-11	2,770,072.24 \$	YES	ARFVTF	11	601.118C	2,770,072.24 \$
ECAA	\$		\$					\$
State- ERPA	\$		\$					\$
Federal	\$		\$					\$
PIER - E	\$		\$					\$
PIER - NG	\$		\$					\$
Reimbursement	\$		\$					\$
Other	\$		\$					\$
<b>TOTAL:</b>	<b>\$0</b>	<b>TOTAL:</b>	<b>\$0</b>		<b>TOTAL:</b>			<b>\$0</b>

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

Contractor's Administrator/ Officer		Contractor's Project Manager	
Name:	Paul Gruber	Name:	Paul Gruber
Address:	2028 Academic Surge UC, Davis	Address:	2028 Academic Surge UC, Davis
City, State, Zip:	Davis, CA 95616	City, State, Zip:	Davis, CA 95616
Phone/ Fax:	(530) 752-1934 /	Phone/ Fax:	(530) 752-1934 /
E-Mail:	pwgruber@ucdavis.edu	E-Mail:	pwgruber@ucdavis.edu

**Contractor Is**

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)

**Selection Process Used**

Solicitation Select Type Solicitation #: \_\_\_\_\_ # of Bids: \_\_\_\_\_ Low Bid?  No  Yes  
 Non Competitive Bid (Attach CEC 96)  
 Exempt Interagency

**Civil Service Considerations**

Not Applicable (Contract 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:**

**Payment Method**

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

**Retention**

- 1. Is contract subject to retention?  No  Yes
- If Yes, Do you plan to release retention prior to contract termination?  No  Yes

**Justification of Rates**

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

- 1.  Not Applicable
- 2.  Meets DVBE Requirements DVBE Amount:\$ \_\_\_\_\_ DVBE %: \_\_\_\_\_
  - Contractor is Certified DVBE
  - Contractor is Subcontracting with a DVBE: \_\_\_\_\_
- 3.  Requesting DVBE Exemption (attach CEC 95)

- Is Contractor a certified Small Business (SB), Micro Business (MB) or DVBE?**  No  Yes
- If yes, check appropriate box:  SB  MB  DVBE

- Is Contractor subcontracting any services?**  No  Yes
- If yes, give company name and identify if they are a Small Business (SB), Micro Business (MB) and/or DVBE:

	<input type="checkbox"/> No	<input type="checkbox"/> SB	<input type="checkbox"/> MB	<input type="checkbox"/> DVBE
	<input type="checkbox"/> No	<input type="checkbox"/> SB	<input type="checkbox"/> MB	<input type="checkbox"/> DVBE
	<input type="checkbox"/> No	<input type="checkbox"/> SB	<input type="checkbox"/> MB	<input type="checkbox"/> DVBE
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	<input type="checkbox"/> No	<input type="checkbox"/> SB	<input type="checkbox"/> MB	<input type="checkbox"/> DVBE



**Miscellaneous Contract Information**

- 1. Will there be Work Authorizations?  No  Yes
- 2. Is the Contractor providing confidential information?  No  Yes
- 3. Is the contractor going to purchase equipment?  No  Yes
- 4. Check frequency of progress reports  
 Monthly  Quarterly
- 5. Will a final report be required?  No  Yes
- 6. Is the contract, with amendments, longer than a year? If yes, why?  No  Yes

The work being performed will take longer than one year to complete.



The following items should be attached to this CRF		
1. Scope of Work, Attach as Exhibit A.	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
2. Budget Detail, Attach as Exhibit B.	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
3. CEC 96, NCB Request	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
4. CEC 30, Survey of Prior Work	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
5. CEC 95, DVBE Exemption Request	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
6. Draft CEQA Notice of Exemption (NOE)	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
7. Resumes	<input type="checkbox"/> N/A	<input type="checkbox"/> Attached
8. CEC 105, Questionnaire for Identifying Conflicts		<input type="checkbox"/> Attached
9. CEC 106, IT Component Reporting Form		<input type="checkbox"/> Attached

 \_\_\_\_\_  
 Contract Manager

4/17/12  
 \_\_\_\_\_  
 Date

 \_\_\_\_\_  
 Office Manager

4/21/12  
 \_\_\_\_\_  
 Date

 \_\_\_\_\_  
 Deputy Director

4/24/12  
 \_\_\_\_\_  
 Date

The following signatures are only required when contract approval is delegated to the Executive Office and not approved at a Business Meeting. See Business Meeting Information Section.

\_\_\_\_\_  
 Presiding Policy Committee

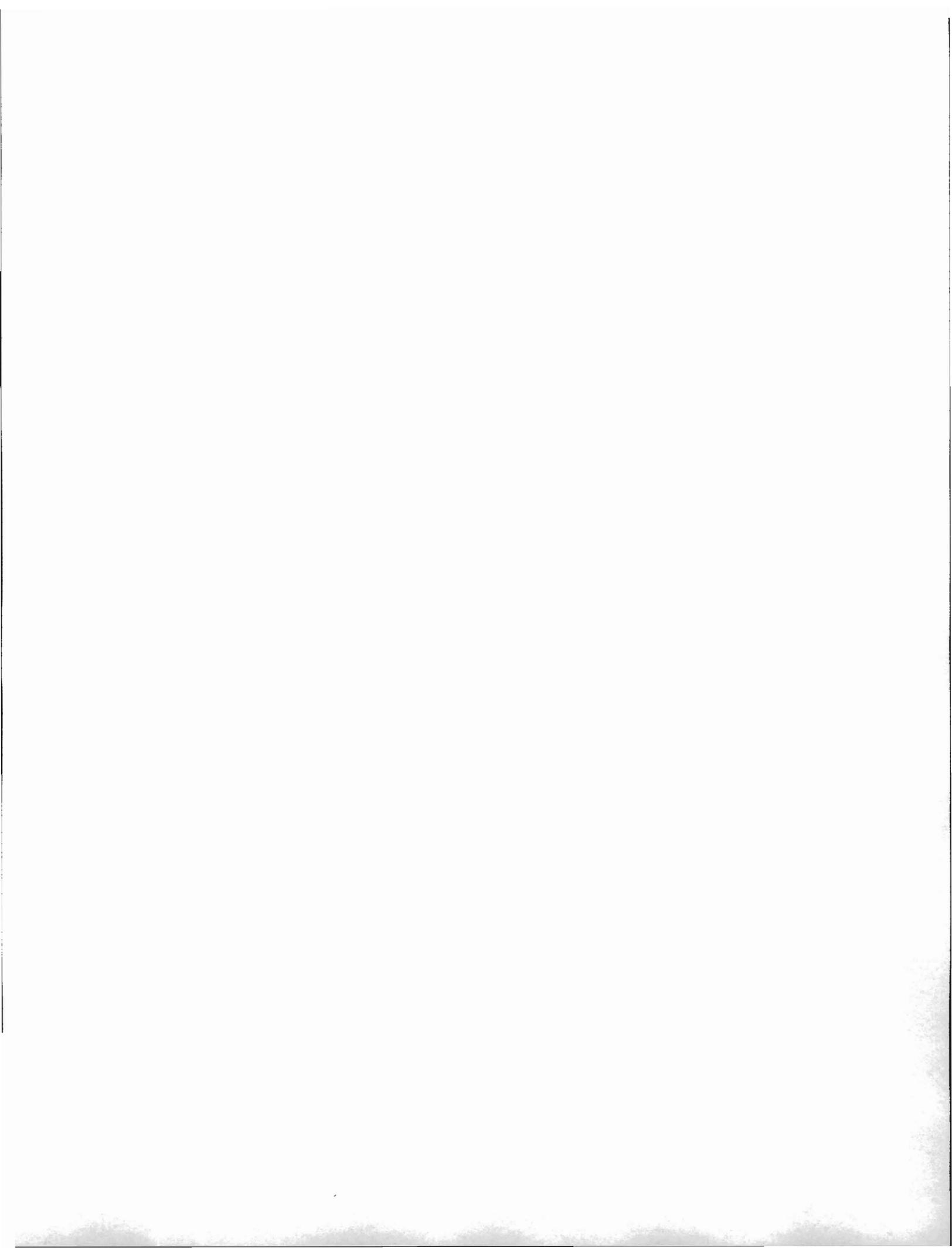
\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Associate Policy Committee

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Executive Director

\_\_\_\_\_  
 Date



**Exhibit A  
SCOPE OF WORK**

**TASK LIST**

<b>Task #</b>	<b>Task Name</b>
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

**ACRONYMS/GLOSSARY**

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

<b>Term/Acronym</b>	<b>Definition</b>
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 (EVs, PHEVs, and biofuel vehicles) in California
- Provide two training workshops to Energy Commission staff to build technology awareness on alternative transportation fuels and vehicles
- Assess low carbon options for all non-light duty vehicle (LDV) subsectors (trucks, buses, rail, marine, and aviation), to help the Energy Commission's deliberations in addressing AB118 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](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

- 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 electric vehicles.
- Prepare and submit a Transition Scenarios report which shall include the results of the Transition Scenarios for Alternative Fuels and Vehicles study.

**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 including:
  - sampling design which 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 tools of State policy to manage transitions to non-petroleum based fuels.
- Prepare and submit a Consumer Behavior Report which shall include the results of the longitudinal survey.

**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 work on meeting 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 Biofuel Investment Strategies Report, which shall include the results of the Biofuel Investment Strategies study.

**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 a Best Policy and Incentive Strategies Report, which shall include the results of the Best Policy and Incentive Strategies study.

**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 (EVs, PHEVs, and biofuel 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 each of the three 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 and electric-drive consumers with consumers who do not have these experiences, producing:
    - understandings of whether and how the experiences of alternative fuel and electric-drive 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 Fuel Availability and Choice Report, which shall report the results of the Fuel Availability and Choice study.

**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 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 workshop 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 copy of the workshop agendas
- Prepare and submit a copy of workshop training materials

**Deliverables:**

- Workshop agendas
- Workshop training materials

**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 (trucks, buses, rail, marine, and aviation), to help the Energy Commission's deliberations in addressing AB 118 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 GHG emissions.
  - Examine scenarios (including increased use of biofuels, CNG/LNG, electricity, and hydrogen) out to 2050 for non-LDV transportation GHG emissions in California.
- Prepare and submit a Low Carbon Options for non-LDV Subsectors Report, including the results of the Low Carbon Options for non-LDV Subsectors study.

**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.

### **The Contractor shall:**

- Complete a Detailed Assessment of Natural Gas as a Transportation Fuel study which shall include the following:
  - Estimate natural gas demand for transportation: develop scenarios for future use of natural gas as a transportation fuel in California, considering all potential transportation subsectors (light duty, heavy duty, marine, etc.)
- Develop and conduct a Natural Gas Vehicle Modeling Study to better understand different high efficiency options for using natural gas in light 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 advanced 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 low carbon fuel standard.
- Prepare and submit a Natural Gas Vehicle Modeling Study report, which shall include the results of the Natural Gas Vehicle Modeling Study.

### **Deliverables:**

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

## **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 were made available, in part, with CEC funding.)
- 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.

**Deliverables:**

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

**SCHEDULE OF DELIVERABLES AND DUE DATES**

<b>Task Number</b>	<b>Deliverable</b>	<b>Due Date</b>
<b>1</b>		
1.1	An Updated Schedule of Deliverables	If applicable
1.2	Invoices	With progress report
1.4	Quarterly Progress Reports	Quarterly
1.5.1	Draft Outline of the Final Report Final Outline of the Final Report	February 1, 2014 March 1, 2014
1.5.2	Draft Final Report Final Report	May 1, 2014 June 1, 2014
1.6	Written documentation of meeting agreements Schedule for completing closeout activities	June 15, 2014 June 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 Updates Report	June 1, 2013
	First Research Update Meeting Summary	July 1, 2013
	Final Research Update Report	July 1, 2014
	Final Research Update Meeting Summary	July 1, 2014
<b>2</b>		
	Draft Transition Scenarios Report	May 1, 2014
	Final Transition Scenarios Report	May 1, 2014

<b>3</b>		
	Draft Consumer Behavior Report	April 1, 2014
	Final Consumer Behavior Report	May 1, 2014
<b>4</b>		
	Draft Biofuel Investment Strategies Report	April 1, 2014
	Final Biofuel Investment Strategies Report	May 1, 2014
<b>5</b>		
	Draft Best Policy and Incentive Strategies Report	April 1, 2014
	Final Best Policy and Incentive Strategies Report	May 1, 2014
<b>6</b>		
	Draft Fuel Availability and Choice Report	April 1, 2014
	Final Fuel Availability and Choice Report	May 1, 2014
<b>7</b>		
	Workshop agendas	October 1, 2012
	Workshop training materials	October 1, 2012
<b>8</b>		
	Draft Low Carbon Options for non-LDV Subsectors Report	April 1, 2014
	Final Low Carbon Options for non-LDF Subsectors Report	May 1, 2014
<b>9</b>		
	Draft Natural Gas Vehicle Modeling Study Report	April 1, 2014
	Final Natural Gas Vehicle Modeling Study Report	May 1, 2014
<b>10</b>		
	Draft Biorefinery Case Study Report	April 1, 2014
	Final Biorefinery Case Study Report	May 1, 2014