



Award Number: _____

Date: 12 / 18 / 12

Note: The Energy Commission Project Managers Manual includes detailed instructions on how to complete this section, with examples of grants that are “Projects” and are not “Projects”. When the Project Manager is completing this section, if questions arise as to the appropriate answers to the questions below, please consult with the Energy Commission attorney assigned to review grants or loans for your division.

1. Is grant/loan considered a “Project” under CEQA? Yes (skip to question #2) No (continue with question #1)

Please complete the following: [Public Resources Code (PRC) 21065 and 14 California Code of Regulations (CCR) 15378]:

Explain why the grant/loan is **not** considered a “Project”? The grant/loan will not cause a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because grant/loan involves:

2. If grant/loan is considered a “Project” under CEQA: (choose either **IS** or **IS NOT**)

Grant/loan **IS** exempt:

Statutory Exemption: (List PRC and/or CCR section numbers) _____

Categorical Exemption: (List CCR section number) 15301

Common Sense Exemption. (14 CCR 15061(b)(3))

Explain reason why the grant/loan is exempt under the above section:

The City of Menlo Park Planning Commission said so on 7/23/12, minutes attached.

Please attach draft Notice of Exemption (NOE). Consult with the Energy Commission attorney assigned to your division for instructions on how to complete the NOE.

Grant/loan **IS NOT** exempt. The Project Manager needs to consult with the Energy Commission attorney assigned to your division and the Siting Office regarding a possible initial study.

Exhibit A Scope of Work

TECHNICAL TASK LIST

TASK #	CPR	TASK NAME
1	N/A	Agreement Management/Administration
2	X	Pilot Plant Construction & Operation
3	X	Advanced Hydrocarbon Fuels Development
4	X	Feasibility Study for Commercial Plant
5	N/A	Data Collection and Analysis

KEY NAME LIST

TASK #	KEY PERSONNEL	KEY SUBCONTRACTOR(S)	KEY PARTNER(S)
1	Tim Eggeman Pilot Plant Manager (to be hired)		
2	Pilot Plant Manager (to be hired)	Landmark Builders	GreenWood Resources
3	Tim Eggeman	National Renewable Energy Laboratory	Chrysler Group LLC
4	Tim Eggeman		
5	Tim Eggeman Pilot Plant Manager (to be hired)		

GLOSSARY

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

ACRONYM	DEFINITION
CAM	Commission Agreement Manager
CPR	Critical Project Review
ARFVT	Alternative and Renewable Fuel and Vehicle Technology
CI	Carbon Intensity
FTD	Fuels and Transportation Division
GHG	Greenhouse Gas
LCFS	Low Carbon Fuel Standard
C3	3-carbon compound, e.g. propanol
LCA	Life Cycle Assessment
T&C	Terms and Conditions
Neat	Same as drop-in fuel

BACKGROUND:

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVT Program). 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.

The California Energy Commission issued solicitation PON-11-601 to provide funding opportunities under the ARFVT Program for projects which either create new, low carbon fuel production facilities, or lower the carbon intensity of fuels produced at existing facilities. To be supported, a project must demonstrate both economically competitive yields and lower GHG potential than the Low Carbon Fuel Standard (LCFS) for corn ethanol or soy biodiesel pathways. In response to PON-11-601, ZeaChem Inc. submitted application #31 was recommended for funding under the round two Notice of Proposed Award issued on October 5, 2012. ZeaChem Inc.'s application is incorporated by reference to this Agreement in its entirety.

PROBLEM STATEMENT:

Replacement of petroleum-derived transportation fuels with non-petroleum alternatives from domestic resources continues to be a high priority to ensure the energy security, environmental stability and continued economic development for California. The Pilot Plant & Commercial Feasibility Study for Biobased Gasoline Blendstocks project proposed by ZeaChem Inc. will focus on the conversion of cellulosic feedstocks into hydrocarbons for use as gasoline substitutes. The main barriers addressed by this work are the lack of sufficient pilot plant data to justify scale-up of promising cellulosic biomass conversion technologies, the lack of fuel properties data that provides the basis upon which to evaluate suitability of bio-based hydrocarbons for use as gasoline substitutes, and the lack of commercial project development efforts needed to establish the entire biorefinery supply chain. This project provides an integrated approach consisting of parallel technology-, product-, and project-development efforts, resulting in a holistic demonstration of non-petroleum gasoline substitute production.

GOALS OF THE AGREEMENT:

The goal of this grant is to design, build, and operate a pilot plant to produce non-petroleum gasoline substitutes from domestic biomass resources and to prepare a comprehensive feasibility study for a commercial biorefinery in Northern California that produces gasoline substitutes from local biomass feedstocks.

The project goal includes the State's sustainability goals for the reduction of greenhouse gas emissions from transportation, protection of the environment and promotion of superior environmental performance of the supply chain, and enhancing market and public acceptance of sustainably produced renewable fuels. This goal will be met by the successful completion of the three project objectives: 1) successful pilot plant testing of the alcohol platform; 2) successful evaluation of prototype samples of advanced hydrocarbons; and 3) completion of a commercial feasibility study for a California biorefinery.

Objective 1: Successful Pilot Plant Testing of the C3 Platform

A process development effort based on pilot testing of the Company's C3 Platform is a prerequisite for commercial deployment. A biomass-to-alcohols pilot plant will be assembled and operated for approximately two years. The measureable technical performance target is a minimum yield of 78% of theoretical for production of propanol from sugars. The technical performance of the pilot plant will be recorded in non-confidential written reports and the results used as a basis for estimating the economic, environmental, and social sustainability metrics for a future commercial biorefinery in Northern California.

Objective 2: Successful Evaluation of Prototype Samples of Advanced Hydrocarbon Fuels

A product development effort for a new fuel component must build market and public acceptance and should start by engaging major stakeholders to evaluate prototype samples. The measureable performance metric is the production of 1 liter prototype samples of the "neat" biofuel and a finished gasoline made by blending with the "neat" biofuel. A leading national lab (*i.e.*, NREL) and a major automobile manufacturer (*i.e.*, Chrysler) will provide non-confidential written evaluations of prototype samples of the advanced hydrocarbon blendstock and finished gasolines that include: 1) an opinion on the desirability of integrating the proposed blendstock into the fuel supply chain including a discussion of potential infrastructure compatibility issues, and 2) an outline of future product development activities needed to gain commercial acceptance of the proposed blendstock.

Objective 3: Complete Commercial Feasibility Study for a California Biorefinery

A commercial development effort must start by identifying and quantifying all of the major elements that determine success for a commercial biorefinery. A comprehensive commercial feasibility study will be assembled for a biorefinery in Northern California. A non-confidential report will be written that presents the results of the feasibility study and provides recommendations on how to proceed with additional commercial development.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Agreement Manager will provide an agenda to all potential meeting participants and designate the date and location of this meeting.

The Commission Agreement Manager shall:

- Designate the date and location of the Kick-Off Meeting.
- Invite the CEC Grants Officer, a CEC Accounting Office representative and others.
- Provide the Kick-Off Meeting Agenda
 - The administrative portion of the meeting shall include, but not be limited to, discussion of the following:
 - Agreement terms and conditions
 - Critical Project Review (Task 1.2)
 - Match fund documentation (Task 1.6).
 - Permit documentation required (Task 1.7)
 - Subcontracts needed to carry out project (Task 1.8)
 - The technical portion of the meeting shall include, but not be limited to, discussion of the following:
 - The Commission Agreement Manager's expectations for accomplishing tasks described in the Scope of Work
 - An updated Schedule of Products
 - Monthly Progress Reports (Task 1.4)
 - Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
 - Final Report requirements(Task 1.5)

The Recipient shall:

- Attend a Kick-Off Meeting at the invitation of the CAM
 - The Recipient shall bring its Project Manager, Agreement Administrator, Accounting Officer, and others designated by the Commission Agreement Manager to this meeting.
- Update the Schedule of Products.
- Update the List of Match Funds.
- Update the List of Permits.

Commission Agreement Manager Product:

- Kick-Off Meeting Agenda

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds
- Updated List of Permits

Task 1.2 Critical Project Review (CPR) Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Agreement Manager and as shown in the Technical Task List above. However, the Commission Agreement Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Recipient.

Participants include the Commission Agreement Manager and the Recipient and may include the Commission Grants Officer, the Fuels and Transportation Division (FTD) team lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Agreement Manager to provide support to the Energy Commission.

The Commission Agreement Manager shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see the Terms and Conditions, Section 8). If the Commission Agreement Manager concludes that satisfactory progress is not being made, this conclusion will be referred to the Lead Commissioner for Transportation for his or her concurrence.
- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work on the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the Commission

Agreement Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.

- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Commission Agreement Manager Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement. This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the Commission Agreement Manager. The Commission Agreement Manager will determine the appropriate meeting participants. The final meeting must be completed during the closeout of this Agreement, before the End Date. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Agreement Manager. Prior to the meeting, the Commission Agreement Manager will provide an agenda to all potential meeting participants and designate the date and location of this meeting.

The Commission Agreement Manager shall:

- Designate the date and location of this meeting.
- Invite the CEC Grants Officer and others.
- Provide the Final Meeting Agenda
 - The administrative portion of the meeting shall include, but not be limited to, discussion of the following closeout items:
 - Schedule for closing the agreement
 - Final invoicing and release of retention schedule
 - Match fund documentation (Task 1.6).
 - Prevailing Wages reporting (Special T&C)
 - End date of reimbursable work
 - Status of the Final Report (Task 1.5)
 - Status of Subcontracts (Task 1.8)
 - Surviving Agreement provisions
 - Any equipment purchased with Energy Commission funds is the property of Recipient (Options)
 - Energy Commission's request for specific "generated" data (not already provided in Agreement products) (Task 5)
 - Recommendations for program improvements
 - The technical portion of the meeting shall include, but not be limited to, discussion of the following:

- Results
- The Recipient's assessment of the degree to which project and task goals and objectives were achieved,
- Recommend next steps (if any) for the technical work

The Recipient shall:

- Invite Recipient Project Manager, Recipient Agreement Administrator, Recipient Accounting Officer, and others designated by the Commission Agreement Manager to this meeting.
- Attend Final Meeting(s) at the invitation of the CAM
- Discuss closeout items.
- Prepare a schedule for completing the closeout activities for this Agreement.
- Make recommendations for improvements.
- Present Technical findings, conclusions, and recommendations.
 - Illustrate the results with photos and graphs in a PowerPoint.

Recipient Products:

- Presentation of findings, conclusions, and recommendations
- Written documentation of meeting agreements
- Schedule for completing closeout activities

Commission Agreement Manager Product:

- Final Meeting Agenda

Task 1.4 Monthly Progress Reports

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

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns.
- Submit each progress report to the Commission Agreement Manager within 10 days of the end of the reporting period.
- Follow the recommended specifications for each progress report contained in Section 6 of the Terms and Conditions of this Agreement.

- In the first Monthly Progress Report and first invoice, document and verify match expenditures and provide a synopsis of project progress, if match funds have been expended or if work funded with match share has occurred after the notice of proposed award but before execution of the grant agreement. If no match funds have been expended or if no work funded with match share has occurred before execution, then state this in the report. All pre-execution match expenditures must conform to the requirements in the Terms and Conditions of this Agreement.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements to the FTD project management processes.

The Final Report shall be a public document.

The Recipient shall:

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the approved outline and the latest version of the Final Report guidelines which will be provided by the Commission Agreement Manager. The Commission Agreement Manager shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed at least 60 days before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

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

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of Energy Commission funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Agreement Manager at least 2 working days prior to the kick-off meeting. Provide in the letter a list of the match funds that identifies the:
 - Amount of each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
 - Amount of each in-kind contribution; a description; documented market or book value, and, in the case of land, the appraisal; and its 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 Recipient shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant, a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Agreement Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Agreement Manager within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task is to obtain 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. Although the Energy Commission budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Agreement Manager at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, 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
 - The schedule the Recipient 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 and develop a timetable for submitting the updated list, schedule and the copies of the permits. 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 and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Commission Agreement Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Agreement Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Agreement Manager within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- A copy of each approved permit (if applicable)
- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)

Task 1.8 Manage Subcontracts

The goal of this task is to ensure quality products and to procure subcontracts required to carry out the tasks under this Agreement consistent with the terms and conditions of this Agreement and the Recipient's own procurement policies and procedures. It will also provide the Energy Commission an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement, that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Manage and coordinate subcontractor activities. Submit a draft of each subcontract required to conduct the work under this Agreement to the Commission Agreement Manager for review. Submit a final copy of the executed subcontract.
- If Recipient decides to add new subcontractors, it shall notify the Commission Agreement Manager.

Products:

- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 PILOT PLANT CONSTRUCTION & OPERATION

The goal of this task is to design, assemble, and operate a biomass-to-alcohols pilot plant at the Company's Menlo Park, CA facility that produces a minimum yield of 78% of theoretical for the production of propanol from sugars. The construction phase is all internal to the existing building in a well established business park. This task is directly aligned to achieve Objective 1 of the project. The task is broken down into a number of subtasks to facilitate project management and ensure timely start of dependent Tasks 3 and 4.

Subtask 2.1 Complete Pilot Plant Design and Cost Schedule

The goal of this subtask is to complete the design of the pilot plant including equipment specifications and floor layout, develop a detailed cost schedule including procurement, delivery and installation costs for process equipment and required ancillary systems, and develop an installation schedule for the equipment.

The Recipient shall:

- Develop specifications for process and utility equipment
- Identify interfaces between process and/or utility systems
- Develop pilot plant layout
- Prepare a Bill of Materials for Pilot Plant Equipment. This document shall include but is not limited to:
 - A description of each item
 - Test protocols and codes applicable to each item
 - Cost estimate or bids for each item
 - Installation estimates or bids for each item or system

- Prepare an Installation Schedule for pilot plant equipment with the general contractor

Products:

- Pilot Plant Layout
- Bill of Materials for Pilot Plant equipment
- Installation Schedule

Subtask 2.2 Equipment Procurement

The goal of this subtask is to procure all equipment.

The Recipient shall:

- Procure equipment
- Prepare a Written Notification of Procurement Completion for the Commission Agreement Manager. The letter shall include but is not limited to written documentation that the recipient has completed procurement of the pilot plant equipment.

Product:

- Written Notification of Procurement Completion

Subtask 2.3 Installation of Equipment

The goal of this subtask is to install all process and ancillary equipment and complete punchlists for each system. A Critical Project Review (CPR) Meeting will be held during this Task. See Task 1.2 for details.

The Recipient shall:

- Oversee installation of the equipment by the general contractor and vendor reps as appropriate.
- Test each system and identify punch list items for the general contractor or vendor to complete.
- Prepare a Written Notification of Mechanical Completion for the Commission Agreement Manager. The letter shall include but is not limited to written documentation that the pilot plant is mechanically complete and the date commissioning will begin.

Products:

- Written Notification of Mechanical Completion

Subtask 2.4 Commissioning

The goal of this subtask is to commission all process and ancillary equipment and conduct an integrated shakedown of the entire facility.

The Recipient shall:

- Complete readiness reviews for each system and oversee completion of outstanding items.
- Run the pilot plant on water and then feedstock to line out and calibrate systems.
- Prepare a Written Notification of Operational Readiness for the Commission Agreement Manager. The letter shall include but is not limited to written documentation that the recipient is ready to operate the pilot plant and the date such operations will begin.

Product:

- Written Notification of Operational Readiness

Subtask 2.5 Operations

The goal of this subtask is to operate the pilot plant for at least 12 months and preferably 24 months in discrete campaigns to optimize the process for the intermediate C3 product. Data and samples from the campaigns will be used in Tasks 3 and 4.

A Critical Project Review (CPR) Meeting will be held during this Task. See Task 1.2 for details.

The Recipient shall:

- Prepare the sample pilot run test plan. The Sample Test Plan shall include, but is not limited to:
 - A description of the process to be tested
 - The rationale for why the tests are required
 - Predicted performance based on calculations and simulation
 - Test objectives and technical approach
 - Test matrix with number of conditions and replicated runs
 - Description of facilities, equipment, and installation required
 - Description of test procedures including parameters to be controlled and those to be measured.
 - Data collection and analysis methods and schedule
 - Sampling methods and schedule
 - Quality assurance procedures
 - Contingency plans
- Develop specific test plans for each run using the Sample Test Plan template
- Conduct runs and collect data
- Analyze the data and use it in process design activities to set key process variables and identify their sensitivity to various inputs
- Prepare Monthly Operation Reports. The Monthly Operations Reports shall include, but are not limited to:
 - A narrative on operational highlights from the previous month
 - A summary of time operating (up and down time)
 - Feedstocks processed. Identify type, estimated distance shipped/transported, and mode of transport.
 - Quantity and types of products produced.
 - Efficiency of conversion, measured as the percent of theoretical yield for production of propanol from sugars.
- Prepare the First Year Operations Report. This report shall include, but is not limited to:
 - Test results from select runs that portray the range of testing performed
 - Conclusions and recommendations
- Write the Specifications for the Commercial Product Report

Products:

- Sample Test Plan Report
- Incorporation of monthly operations data into the Monthly Progress Report

- First Year Operations Report
- Specifications for the Commercial Product Report

TASK 3 ADVANCED HYDROCARBON FUELS DEVELOPMENT

The goal of this task is to produce prototype samples of the advanced hydrocarbon blendstock and have them evaluated by major outside stakeholders for suitability of use as a gasoline substitute. A prototype 1 liter sample of the proposed advanced hydrocarbon blendstock and a prototype 1 liter sample of final gasoline blended using the proposed blendstock will be produced and analyzed for fuel specification conformance and initial fit for purpose tests. The data from these tests and the physical prototype samples will be provided to NREL and Chrysler for their evaluation. This task is directly aligned to achieve Objective 2 of the project. The product of this task is a report on the evaluation results. Start of work for this task is dependent upon the pilot-scale production of alcohols from the C3 Platform in Task 2.

The following subtasks detail the activities of this task.

Subtask 3.1 Prepare prototype samples of “neat” gasoline substitutes & final gasoline blends

The goal of this subtask is to produce prototype samples of the advanced hydrocarbon blendstock. Gasoline is made by combining several blendstocks to ensure that all fuel requirements of the final mixture are met. Fuel property testing of both the “neat” (i.e., un-blended) advanced hydrocarbon blendstock and a final blended gasoline product are needed to properly evaluate the suitability of the fuel as a gasoline substitute.

The Recipient shall:

- Determine the necessary reaction steps to upgrade the C3 intermediate to a gasoline blendstock.
- Produce a prototype 1 liter sample of the proposed advanced hydrocarbon blendstock.
- Produce a prototype 1 liter sample of final gasoline blended using the proposed blendstock.
- Comprehensive photographs of entire sample production process including all installed equipment.

Product:

Comprehensive photographs of entire sample production process including all installed equipment.

Subtask 3.2 Evaluate gasoline substitutes and final gasoline blends against fuel and engine specifications

The goal of this subtask is to have a major fuels testing laboratory (i.e., NREL) and a major automobile manufacturer (i.e., Chrysler) provide written evaluations of prototype samples of the advanced hydrocarbon blendstock and finished gasolines that includes:

- An opinion on the desirability of integrating the proposed blendstock into the fuel supply including a discussion of potential infrastructure compatibility issues

- An outline of future product development activities needed to gain commercial acceptance of the proposed blendstock.

The Recipient shall:

- Analyze the prototype sample of the proposed advanced hydrocarbon blendstock and prototype sample of final gasoline blended using the proposed blendstock for fuel specification conformance and initial fit for purpose tests. The data from these tests and the physical prototype samples will be provided to Chrysler for their evaluation.
- Complete an Advanced Hydrocarbon Fuels Test Report

Product:

- Advanced Hydrocarbon Fuels Test Report

TASK 4 FEASIBILITY STUDY FOR COMMERCIAL PLANT

The goal of this task is to complete a comprehensive feasibility study for a commercial biorefinery in Northern California. Elements of the feasibility study include: 1) a feedstock resource assessment to define the availability and costs of feedstock; 2) a market and logistics study to refine understanding of fuel markets in California; 3) a carbon emission/life cycle study to define the environmental impacts of the proposed biorefinery supply chain; 4) an economic impact study; 5) a preliminary design and cost estimate for the proposed biorefinery; 6) an environmental permitting evaluation to define required permitting activities and their schedule; and 7) project modeling to develop a pro forma for the commercial project. The product of this task is a non-confidential report about the commercial feasibility study.

The Recipient shall:

- Develop the appropriate scope of each study element based on data from Tasks 2 and 3 and the Specifications for the Commercial Product Report.
- Hire subcontractor experts to complete the scope of each study element.
- Oversee the completion of each study element by the subcontractors and provide input as needed.
- Prepare the Commercial Feasibility Study for Biobased Gasoline Blendstocks Report which shall include, but is not limited to:
 - Goal of the study
 - Approach used including literature review
 - Scope of the study
 - Results including graphs and analysis
 - Conclusions and Recommendations

Product:

- Comprehensive report summarizing the Commercial Feasibility Study for Biobased Gasoline Blendstocks

TASK 5 DATA COLLECTION AND ANALYSIS

The goal of this task is to collect and analyze operational data to determine the economic viability and environmental impact of the project. Final analysis of all project data must be included in the Final Report.

The Recipient Shall:

- Collect 6 months of operational data from the fuel production system to include:
 - Time operating (up and down time)
 - Efficiency of conversion of feedstock to fuel & co-products
 - Biofuel production rate
 - Quality and quantity of fuel produced
- Estimate gasoline and/or petroleum-based diesel fuel that will be displaced annually.
- Explain how the project will reduce criteria air pollutants and air toxics and reduce or avoid multi-environmental impact, and lead to a decrease, on a life cycle basis, in emissions of water pollutants or any other substances known to damage human health or the environment.
- Describe the sustainability goals and explain how the project incorporated and achieved the sustainability goals.
- Provide a quantified estimate of the project's carbon intensity values for life-cycle greenhouse gas emissions.
- Quantify any water efficiency and water use reduction measures used in the project including, but not limited to, the use of recycled or reclaimed water and the reduction or elimination of point and nonpoint source wastewater discharge.
- Describe any potential use of renewable energy or cogeneration in the project.
- Describe any potential energy efficiency measures used in the project that would exceed Title 24 standards in Part 6 of the California Code of Regulations.
- Provide data on expected job creation both direct and indirect, economic development, and increased state revenue.
- Compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments.
- Describe how the project supports new technology advancement for vehicles, vessels, engines, and other equipment, and promotes the deployment of such technologies in the marketplace. To the extent possible, describe how the project provides a measurable transition from the nearly exclusive use of petroleum fuels to a diverse portfolio of viable alternative fuels that meets California's petroleum reduction and alternative fuel use goals.
- Describe how the project achieves greenhouse gas emissions reduction.
- Provide additional data that may be requested by the Energy Commission during the term of this Agreement, as is reasonably available.

Products:

- The above information and data shall be included in the Final Report.