

**CONTRACT REQUEST FORM (CRF)**



A) New Agreement 800-13-004 (To be completed by CGL Office)

B) Division	Agreement Manager:	MS-	Phone
800 Electricity Supply Analysis Division	Sylvia Bender	27	916-653-6841

C) Contractor's Legal Name	Federal ID Number
ENERGY AND ENVIRONMENTAL ECONOMICS, INC.	94-3218646

D) Title of Project
The Greenhouse Gas Policy Analysis Tool Module

E) Term and Amount	Start Date	End Date	Amount
	6 / 1 / 2014	12 / 31 / 2014	\$ 125,000

**F) Business Meeting Information**

Operational agreement (see CAM Manual for list) to be approved by Executive Director

ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	5 / 14 / 2014	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
Business Meeting Presenter	Sylvia Bender	Time Needed:	5 minutes

Please select one list serve. EnergyPolicy (Integrated Energy Policy Report)

**Agenda Item Subject and Description**

ENERGY AND ENVIRONMENTAL ECONOMICS, INC. Proposed resolution approving Agreement 800-13-004 with Energy and Environmental Economics, Inc. (E3) for a \$125,000 contract to integrate specific technical data and analysis into the Greenhouse Gas Policy Analysis Tool (GPAT). The modules are part of a broader tool being developed for joint use by the Air Resources Board, California Public Utilities Commission, California Independent System Operator, and the California Energy Commission (Energy Principals) to examine pathways for achieving deep reductions in state greenhouse gas emissions. Deliverables will include: 1) transportation module inputs, 2) transportation scenarios and energy supply interactions, 3) bioenergy supply module and input data, and 4) bioenergy and other land use-related emissions module. (ERPA funding) Contact: Sylvia Bender. (5 minutes).

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

1. 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 it will have no significant effect on the environment.

2. 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  
 Initial Study       Environmental Impact Report  
 Negative Declaration       Statement of Overriding Considerations  
 Mitigated Negative Declaration

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

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

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

Legal Company Name:

**CONTRACT REQUEST FORM (CRF)**

CEC-94 (Revised 01/13)

CALIFORNIA ENERGY COMMISSION

**J) Budget Information**

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
State - ERPA	2013/14	100.151	\$100,000
State - ERPA	2013/14	100.152	\$25,000
Funding Source			\$
Funding Source			\$
Funding Source			\$
R&D Program Area: N/A		TOTAL:	\$125,000
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

**K) Contractor's Administrator/ Officer**

Contractor's Administrator/ Officer				Contractor's Project Manager			
Name:	Snuller Price			Name:	Snuller Price		
Address:	101 Montgomery Street, 16th Floor			Address:	101 Montgomery Street, 16th Floor		
City, State, Zip:	San Francisco, California 94104			City, State, Zip:	San Francisco, California 94104		
Phone:	415-391-5100	Fax:	415-391-6500	Phone:	415-391-5100	Fax:	415-391-6500
E-Mail:	sculler@ethree.com			E-Mail:	sculler@ethree.com		

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

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

**M) Contractor Entity Type**

Private Company (including non-profits)  
 CA State Agency (including UC and CSU)  
 Government Entity (i.e. city, county, federal government, air/water/school district, joint power authorities, university from another state)

**N) Is Contractor a certified Small Business (SB), Micro Business (MB) or DVBE?**

No  Yes  
 If yes, check appropriate box:  SB  MB  DVBE

**O) Civil Service Considerations**

Not Applicable (Agreement is with a CA State Entity or a membership/co-sponsorship)  
 Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER)  
 The Services Contracted:  
 are not available within civil service  
 cannot be performed satisfactorily by civil service employees  
 are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.  
 The Services are of such an:  
 urgent  
 temporary, or  
 occasional nature  
 that the delay to implement under civil service would frustrate their very purpose.

**Justification:**

These services are being contracted to provide highly technical expertise related to examining pathways for achieving deep reductions in state greenhouse gas emissions. The technical experience to execute this multi-agency project on a single modeling platform requires unique experience and specialized knowledge and is building on prior work performed.

**P) Payment Method**

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



<b>Q) Retention</b>		
1. Is Agreement subject to retention?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
If Yes, Will retention be released prior to Agreement termination?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes

<b>R) Justification of Rates</b>
Services provided at this rate are consistent with other like services.

<b>S) Disabled Veteran Business Enterprise Program (DVBE)</b>		
1. <input type="checkbox"/> Exempt (Interagency/Other Government Entity)		
2. <input type="checkbox"/> Meets DVBE Requirements	DVBE Amount:\$ 0	DVBE %: _____
<input type="checkbox"/> Contractor is Certified DVBE		
<input type="checkbox"/> Contractor is Subcontracting with a DVBE:	Name of DVBE Company _____	
3. <input type="checkbox"/> Contractor selected through CMAS or MSA with no DVBE participation.		
4. <input checked="" type="checkbox"/> Requesting DVBE Exemption (attach CEC 95)		

<b>T) Miscellaneous Agreement Information</b>		
1. Will there be Work Authorizations?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
2. Is the Contractor providing confidential information?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
3. Is the contractor going to purchase equipment?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
4. Check frequency of progress reports		
<input type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input checked="" type="checkbox"/> None		
5. Will a final report be required?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
6. Is the Agreement, with amendments, longer than a year? If yes, why?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes

<b>U) The following items should be attached to this CRF (as applicable)</b>		
1. Exhibit A, Scope of Work	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
2. Exhibit B, Budget Detail	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
3. CEC 96, NCB Request	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
4. CEC 30, Survey of Prior Work	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
5. CEC 95, DVBE Exemption Request	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached
6. CEQA Documentation	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
7. Resumes	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached
8. CEC 105, Questionnaire for Identifying Conflicts	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Attached

\_\_\_\_\_ Agreement Manager      \_\_\_\_\_ Date      \_\_\_\_\_ Office Manager      \_\_\_\_\_ Date      \_\_\_\_\_ Deputy Director      \_\_\_\_\_ Date

## EXHIBIT A Scope of Work

### The Greenhouse Gas Policy Analysis Tool Module

#### TASK LIST

Task #	Task Name
1	Administration
2	GPAT transportation module inputs
3	Transportation scenarios and interactions with energy supply
4	Data Collection and Analysis
5	Bioenergy and other land-use related emissions module

#### KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Snuller Price, E3		

#### ACRONYMS/GLOSSARY

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

Term/ Acronym	Definition
ARB	Air Resources Board
CCM	Commission Contract Manager
Energy Commission	California Energy Commission
E3	Energy and Environmental Economics, Inc.
GHG	Greenhouse Gas
GPAT	Greenhouse Gas Policy Analysis Tool

## **BACKGROUND**

E3 has been asked to work closely with the Energy Principals and state agencies to develop an achievable and affordable carbon reduction goal for 2030, and an associated roadmap. The ability to deeply reduce CO<sub>2</sub> emissions in transportation, currently the largest single emitting sector, is a linchpin of the overall strategy. Reductions from transportation are already a major component of the AB32 scoping plan, but more analysis is needed to determine the potential contribution of transportation reductions to the 2030 target in the context of decarbonization of electricity and fuel supplies, and from the perspective of achieving the state's goal of 80% reductions below 1990 levels by 2050. A module providing basic functionality for modeling a variety of transportation sector emission reduction alternatives within the Greenhouse Gas Policy Analysis Tool (GPAT) is being developed for the ARB as a separate component of the project. The project proposed here will populate this module with the transportation sector inputs and improvements needed to conduct the "2030 target on the way to the 2050 goal" analysis.

Bioenergy is one important option for emissions reduction in transportation and other sectors. The project will develop a bioenergy supply module covering a variety of biomass feedstocks, conversion processes, and energy carriers for different end uses. The project will also develop basic model functionality for incorporating GHG emissions related to biomass feedstock production and other forms of land use, including basic representations of agriculture and forestry emissions. This work will complement other model functionality being developed by E3 and LBNL for the ARB for use in assessing non-energy GHGs from the industrial sector. In combination, the land use and industrial non-energy and bioenergy emissions modules will provide, at least on a scenario basis, the ability to assess total state gross and net CO<sub>2</sub>e emissions, which is needed for both economy-wide 2030 GHG target setting and for setting emissions budgets for energy-related CO<sub>2</sub>. This work will be undertaken in close cooperation with the CEC, ARB, and other relevant agencies.

## **PURPOSE AND GOALS OF THE CONTRACT**

The purpose of this contract is to award Energy and Environmental Economics, Inc. (E3) with \$125,000 to integrate specific technical data and analysis into the Greenhouse Gas Policy Analysis Tool (GPAT). The modules are part of a broader tool being developed for joint use by the Air Resources Board, California Public Utilities Commission, California Independent System Operator, and the California Energy Commission (Energy Principals) to examine pathways for achieving deep reductions in state greenhouse gas emissions. Deliverables will include: 1) transportation module inputs, 2) transportation scenarios and energy supply interactions, 3) bioenergy supply module and input data, and 4) bioenergy and other land use-related emissions module.

## **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 website:

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.

### **TASK 1- CONTRACT 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 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.
- Prepare a 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.

## **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 to the Energy Commission's Accounting Office.

### **Deliverables:**

- Invoices

## **TECHNICAL TASKS**

We will develop transportation inputs and scenarios, a bioenergy supply module, and a basic module structure for bioenergy and land use-related emissions for the GPAT, which will be undertaken in four tasks:

- GPAT transportation module inputs
- Transportation scenarios and interactions with energy supply
- Bioenergy supply module including inputs
- Bioenergy and other land-use related emissions module

## **TASK 2 - GPAT TRANSPORTATION MODULE INPUTS**

This task will develop the data inputs for decarbonization alternatives in the transportation module of the GPAT. Subsectors modeled include four on-road subsectors – light duty vehicles, medium duty vehicles, heavy duty vehicles, and buses – and seven off-road subsectors - passenger rail, freight rail, ocean going vessels, harbor craft, passenger aviation, freight aviation, and general aviation. The on-road subsectors will be modeled using a vehicle fleet stock-rollover consistent with ARB planning documents, especially EMFAC. The off-road vehicle fleet will be modeled based on ARB Vision model projections. All transportation subsectors will be modeled at both aggregate state level and at the level of three air quality regions – the South Coast AQMD, the San Joaquin Valley APCD, and the rest of the state. Data will be obtained and input into the model according to these geographical boundaries.

The transportation decarbonization measures to be modeled can be categorized as service demand reduction (e.g., from SB375 policies), mode shifting, fuel switching, technology changes, and efficiency improvements. Projected cost, performance, and uptake rates for each of these will be taken from a variety of public sources, starting with ARB's EMFAC and VISION, and also including the EIA Annual Energy Outlook 2014, the National Research Council's "Transition to Alternative Vehicles and Fuels," the American Public Transportation Association's Public Transportation Vehicle Database, NHTSA publications and databases, and other relevant studies and journal articles. The data sources and ranges for all input assumptions will be carefully documented.

**Deliverables:**

- Documentation of inputs used for transportation CO2 reduction measures
- Integration of inputs into GPAT model'

**TASK 3 - TRANSPORTATION SCENARIOS AND INTERACTIONS WITH ENERGY SUPPLY**

The transportation technologies modeled include for their prime movers several varieties of internal combustion engines, electric motors, and fuel cells, along with hybrid combinations of these. The energy supplies modeled to power these technologies include gasoline, diesel, ethanol, biodiesel, hydrogen, and natural gas, biogas, and synthetic natural gas in the forms of CNG and LNG. This task entails developing data inputs for primary energy costs and conversion process costs, efficiencies, and emission rates. Many of the same data sources mentioned in Task 1 will be used.

This task also involves developing scenarios to improve understanding of the coordinated development required between different transportation decarbonization pathways and their associated energy supply systems. Three key examples that will be explored through scenarios and sensitivity analyses in this task are electrification, use of liquid biofuels, and use of natural gas and low carbon gases produced from biomass or electricity. Biofuels implications are detailed in Task 3 below. For electrification, a grid charging model being separately developed for the CAISO portion of this project will be applied to generate load shapes for different levels of electrification, which will in turn influence generation portfolio selection. For low carbon gases, a potentially important scenario is one in which over-generation from high renewable energy build-outs is balanced by using the energy to produce hydrogen and synthetic methane, which can then be used as transportation fuels.

**Deliverables:**

- PowerPoint presentation of transportation scenarios
- Documentation of inputs used for transportation scenario costs, conversion efficiencies, fuels
- Integration of scenarios and inputs into GPAT model

## **TASK 4 - BIOENERGY SUPPLY MODULE INCLUDING INPUTS**

This task will develop a module representing multiple potential pathways for bioenergy. The purpose is to develop reasonable estimates of the costs and potential of bioenergy based on a wide range of possible feedstocks, conversion pathways, and end uses. The module will include biomass feedstocks organized by category, for example, municipal wastes, forestry wastes, and purpose grown crops. Supply curves for feedstock price projections will be developed for both California in-state resources and for the U.S. as a whole, so that scenarios of either California-only biofuel supply or U.S. biofuel supplies delivered to California can be developed. The principal data source for cost and quantity will be the DOE Billion Ton Study Update (2011), which has county-level data by type for the whole U.S., supplemented by other studies and journal articles. Conversion processes will include gasification and anaerobic digestion for gaseous energy carriers, cellulosic and conventional fermentation for ethanol, and Fischer-Tropsch and transesterification for biodiesel. Process energy and carbon efficiencies and costs will be drawn primarily from Argonne National Laboratory's GREET model. Model functionality will include the ability to assess bioenergy costs on either a marginal or average cost basis.

### **Deliverables:**

- PowerPoint presentation of biofuel supply scenarios
- Integration of biofuel supply stocks into GPAT

## **TASK 5 - BIOENERGY AND OTHER LAND-USE RELATED EMISSIONS MODULE**

This task will develop a basic module for emissions related to bioenergy feedstock production, including indirect land use change. Deemed values for lifecycle emissions used in the LCFS will be incorporated, and also the ability to input values from other modeling and scholarly publications. Since biofuel lifecycle emissions are a function of complex market and carbon cycle interactions at the global scale, this basic module will be a framework to incorporate initial high-level estimates, and allow for greater detail and model functionality to be developed over time, or linkage to other more specialized models (for example, the Integrated Earth System Model developed by LBNL and PNNL). The same module will also represent other land-use based emissions, for agriculture, forestry, and animal husbandry, which are linked with bioenergy through market mediated effects such as land conversion. Initial estimates for reference case values and mitigation potential will be developed in coordination with relevant agencies.

### **Deliverables:**

- Documentation of assumptions on biofuel and land-use related emissions
- Integration of assumptions into GPAT

The scope of Tasks 2-5 above requires communication with and engagement of the CEC, ARB, and other relevant agencies. We propose to meet with the relevant agencies approximately once every three weeks throughout the project to update them on progress and to seek feedback regarding data inputs and modeling assumptions.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ENERGY AND ENVIRONMENTAL ECONOMICS, INC.

**RESOLVED**, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the CEC 94 Contract Request Form or CEC 270 Grant Request Form (as applicable).

**RESOLVED**, that the Energy Commission approves Agreement 800-13-004 with ENERGY AND ENVIRONMENTAL ECONOMICS, INC. for **\$125,000**, to to integrate specific technical data and analysis into the Greenhouse Gas Policy Analysis Tool (GPAT). The modules are part of a broader tool being developed for joint use by the Air Resources Board, California Public Utilities Commission, California Independent System Operator, and the California Energy Commission (Energy Principals) to examine pathways for achieving deep reductions in state greenhouse gas emissions.

**FURTHER BE IT RESOLVED**, that the Executive Director shall execute the same on behalf of the Energy Commission.

**CERTIFICATION**

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on May 14, 2014.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

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Harriet Kallemeyn,  
Secretariat