



COORDINATING RESEARCH COUNCIL, INC.

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July 31, 2012

In reply, refer to:

CRC Project No. E-88-3

Dear Prospective Bidder:

The Coordinating Research Council (CRC) invites you to submit a written proposal to provide services for "Follow-On Study of Transportation Fuel Life Cycle Analysis: Review of Economic Models Used to Assess Land Use Change Effects." (CRC Project No. E-88-3). A description of the project is presented in Exhibit A, "Statement of Work."

Please indicate by letter, fax, or email by **August 14th, 2012** if you or your organization intends to submit a written proposal for this research program. CRC will answer technical questions regarding the Request for Proposal if they are submitted in writing. CRC will then return written answers to all of the bidders, along with a copy of the original questions.

A CRC technical group composed of industry representatives will evaluate your proposal. CRC reserves the right to accept or reject any or all proposals.

The reporting requirements will be monthly progress reports and a summary technical report at the end of the contractual period. The reporting requirements are described in more detail in the attachment entitled "Reports" (Exhibit B).

The proposal must be submitted as two separate documents. The technical approach to the problem will be described in part one, and a cost breakdown that is priced by task will be described in part two. The cost proposal document should include all costs associated with conducting the proposed program. The technical proposal shall not be longer than 10 pages in length.

CRC expects to negotiate a cost-plus fixed fee or cost reimbursement contract for the research program.

Contract language for intellectual property and liability clauses is presented in Exhibit C and in Exhibit D, respectively.

Important selection factors to be taken into account are listed in Exhibit E. CRC evaluation procedures require the technical group to complete a thorough technical evaluation before considering costs. After developing a recommendation based on technical considerations, the costs are revealed and the recommendation is modified as needed.

Electronic copies of the technical and cost proposals should be submitted to:

Dr. Chris Tennant
Coordinating Research Council
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The deadline for receipt of your proposal is **August 31, 2012**.

Yours truly,

Chris Tennant
Deputy Director

EXHIBIT A

Follow-On Study of Transportation Fuel Life Cycle Analysis: Review of Economic Models Used to Assess Land Use Change Effects

Background

Over the past several years, significant efforts to improve and refine the life cycle assessment (LCA) of transportation fuels have taken place as the science evolves. This has become particularly important as regulatory efforts of the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and other agencies have used LCA as the basis for determining compliance with transportation fuel regulations such as the EPA's Renewable Fuel Standard (RFS2) and CARB's Low Carbon Fuel Standard (LCFS). Although those regulations have been finalized and are now in effect, there remain certain aspects of LCA that continue to be subject to considerable uncertainty and debate.

The Coordinating Research Council (CRC) previously funded a study of transportation fuel LCA (CRC Project E-88) that was intended to review the state of the science, compare the results of different models, and provide information on key inputs to LCA modeling that contribute to uncertainty in the emissions estimates. That study was also to lay out specific recommendations for targeted research to reduce those uncertainties. That report was finalized in 2011 and can be found on CRC's website.¹

To address a number of gaps and uncertainties highlighted in the E-88 study as well as those identified by participants of the 2009 CRC Workshop on the LCA of Biofuels,² CRC funded the E-88-2 project as a follow-on to the E-88 study.³ The E-88-2 study, which was finalized earlier this year, focused on issues related to indirect land use change (ILUC) and agricultural N₂O emissions. Although both E-88 and E-88-2 touched on the economic models used for the assessment of land use change emissions, there was not a targeted review and assessment of those models. As outlined below, this proposed effort (E-88-3) would focus on the agro-economic models used to estimate land use change impacts as a result of the production of biofuels.

Scope of Work

Both EPA and CARB have relied on agro-economic models as the basis of the iLUC estimates for biofuels included in their RFS2 and LCFS rulemakings. Estimating iLUC has become a contentious issue, and the models (and inputs to those models) used to estimate iLUC continue to be refined. Under this project, the following tasks would be performed, with an eye on how best to reduce the uncertainty in the LUC estimates.

¹ See <http://www.crcao.com/reports/recentstudies2011/E-88/E-88%20Report%20v8%20Final%202011.03.02.pdf>.

² See http://www.crcao.com/workshops/LCA%20October%202009/CRC_LCA_Workshop_Summary_01-12-10.pdf for a summary of that workshop.

³ See <http://www.crcao.com/reports/recentstudies2012/E-88-2/CRC%20E-88-2%20Final%20Report.pdf>.

Task 1 - The contractor will review and compare economic models used for iLUC estimates. This will include those models used by both EPA (i.e., FASOM and FAPRI-CARD) and CARB (GTAP). In addition, other land use change models will be reviewed, including the IMPACT model developed by International Food Policy Research Institute and other European models used for this purpose (e.g., LEITAP, CAPRI, AGLINK-COSIMO). Note that the results from many of these models have been previously compared in a study prepared by the European Commission's Joint Research Centre-Institute for Energy in 2011.⁴

Key input parameters and modeling methodologies leading to differences in results among models will be identified and discussed, and the key factors contributing to uncertainty in results will be highlighted. In addition, the impact of anticipated biofuel volumes should be discussed, i.e., are model results linear with respect to biofuel volumes? These agro-economic models were built with different focuses (e.g., national vs. international) and for different sectors (e.g., crops, animal production, commodities, etc.). The contractor should discuss the quality and the limitations of the data sources used to populate these models.

Notable differences have appeared in the treatment of renewable fuels and land use change effects for program credit by various regulatory agencies. Under this task, the contractor should prepare a summary of models and assumptions used by various agencies and the effects on regulatory outcomes or hurdles.

Finally, this task will also include a basic primer on economic modeling including an assessment of the strengths and weaknesses (inputs, outputs, model structure, etc.) of different approaches (e.g., general equilibrium versus partial equilibrium models). It is envisioned that this primer would be included as an appendix to the main report.

Task 2 - The contractor should isolate, to the extent possible, the quantitative impact of key data and model parameters in the various models reviewed. The model parameters and inputs to be addressed in this task would include, but would not be limited to, the following:

- Treatment of crop yield increases and how those are handled in the baseline in both developed and developing countries (e.g., how is mechanization treated in the models?).
- Treatment of co-products (e.g., distillers grains and solubles, soy meal, electricity).
- Crop rotations and crop switching.
- Yield-price elasticity (e.g., what is the basis for current elasticity estimates and how sensitive are model results to this parameter?).
- How intra-elasticities between different biofuels are treated, if at all (e.g., how is ethanol derived from corn and sugarcane or FAME derived from soy and rapeseed differentiated in the models?).

⁴ See

http://ec.europa.eu/energy/renewables/consultations/doc/public_consultation_iluc/study_4_iluc_modelling_comparison.pdf.

- How multiple biofuels in a model run are treated, if at all (e.g., many analyses we have reviewed only consider a single fuel from a single feedstock at a time, which does not represent real market dynamics).
- How the supply of new fuels such as cellulosic biofuels and renewable diesel is treated, if at all.
- How the models account for the expansion of shale gas resources and the concomitant impact on supply in the U.S., if at all (e.g., the potential for increased use of this relatively low-carbon fuel).
- Other key elasticities in the models, the basis for those estimates, and the sensitivity of model outputs to the published range of elasticity values.

A number of the above issues were investigated as part of CARB's Indirect Effects Expert Workgroup (EWG) that was convened in early-2010. A series of whitepapers were drafted by various subgroups of the EWG which can be found on CARB's website.⁵ In addition, the results of a number of GTAP sensitivity analyses were presented at a CARB workshop in September 2011. That information is also available on CARB's website.⁶

Task 3 - To the extent possible, the contractor should attempt to duplicate EPA and CARB results based on available documentation; this would help identify assumptions that are not clearly specified. In particular, new work conducted by EPA and CARB should be reviewed. For example, we understand that CARB is in the midst of revising its LUC estimates for the LCFS, and several new pathways (e.g., biodiesel from palm oil, ethanol from grain sorghum) have been recently published by EPA. Although the release of the CARB estimates is unknown at this time, the contractor should build flexibility into scheduling in order to address these latest estimates by CARB in this study.

We understand that attempting to duplicate LUC results has the potential to be extremely time-consuming. Thus, we are looking to the contractor to target the effort under this task to what they feel are the important pathways and issues to investigate.

Task 4 - As a final task, recommendations for future work will be made with an eye on reducing the uncertainty in the LUC estimates.

⁵ See, for example, <http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/010511-final-rpt-elasticity.pdf>.

⁶ See http://www.arb.ca.gov/fuels/lcfs/09142011_iluc_wtpresentation.pdf.

EXHIBIT B

REPORTS

MONTHLY TECHNICAL PROGRESS REPORTS

The contractor shall submit a monthly technical progress report covering work accomplished during each calendar month of the contract performance. An electronic Microsoft® Word compatible file (<1 MB) of the monthly technical progress report shall be distributed by the contractor within ten (10) calendar days after the end of each reporting period. The report shall contain a description of overall progress, plus a separate description for each task or other logical segment of work on which effort was expended during the reporting period.

FINAL REPORT

The contractor shall submit to or distribute for CRC an electronic pdf-compatible copy transmittable via email) of a rough draft of a final report within thirty (30) days after completion of the technical effort specified in the contract. The report shall document, in detail, the test program and all of the work performed under the contract. The report shall include tables, graphs, diagrams, curves, sketches, photographs and drawings in sufficient detail to comprehensively explain the test program and results achieved under the contract. The report shall be complete in itself and contain no reference, directly or indirectly, to the monthly report(s).

Within thirty (30) days after receipt of the approved draft copy of the final report, the contractor shall make the requested changes and deliver to CRC thirty (30) hardcopies including a reproducible master copy of the final report. The final report shall also be submitted as an electronic copy in a pdf or pdf-convertible file format. The final report may be prepared using the contractor's standard format, acknowledging author and sponsors. An outside CRC cover page will be provided by CRC. The electronic copy will be made available for posting on the CRC website.

EXHIBIT C

INTELLECTUAL PROPERTY RIGHTS

Title to all inventions, improvements, and data, hereinafter, collectively referred to as (“Inventions”), whether or not patentable, resulting from the performance of work under this Agreement shall be assigned to CRC. Contractor X shall promptly disclose to CRC any Invention which is made or conceived by Contractor X, its employees, agents, or representatives, either alone or jointly with others, during the term of this agreement, which result from the performance of work under this agreement, or are a result of confidential information provided to Contractor X by CRC or its Participants. Contractor X agrees to assign to CRC the entire right, title, and interest in and to any and all such Inventions, and to execute and cause its employees or representatives to execute such documents as may be required to file applications and to obtain patents covering such Inventions in CRC’s name or in the name of CRC’s Participants or nominees. At CRC’s expense, Contractor X shall provide reasonable assistance to CRC or its designee in obtaining patents on such Inventions.

To the extent that a CRC member makes available any of its intellectual property (including but not limited to patents, patent applications, copyrighted material, trade secrets, or trademarks) to Contractor X, Contractor X shall have only a limited license to such intellectual property for the sole purpose of performing work pursuant to this Agreement and shall have no other right or license, express or implied, or by estoppel. To the extent a CRC member contributes materials, tangible items, or information for use in the project, Contractor X acknowledges that it obtains only the right to use the materials, items, or information supplied for the purposes of performing the work provided for in this Agreement, and obtains no rights to copy, distribute, disclose, make, use, sell or offer to sell such materials or items outside of the performance of this Agreement.

EXHIBIT D

LIABILITY

It is agreed and understood that _____ is acting as an independent contractor in the performance of any and all work hereunder and, as such, has control over the performance of such work. _____ agrees to indemnify and defend CRC from and against any and all liabilities, claims, and expenses incident thereto (including, for example, reasonable attorneys' fees) which CRC may hereafter incur, become responsible for or pay out as a result of death or bodily injury to any person or destruction or damage to any property, caused, in whole or in part, by _____'s performance of, or failure to perform, the work hereunder or any other act of omission in connection therewith.

EXHIBIT E

PROPOSAL EVALUATION CRITERIA

- 1) Merits of proposed technical approach.
- 2) Previous performance on related research studies.
- 3) Personnel available for proposed study – related experience.
- 4) Timeliness of study completion.
- 5) Cost.