COORDINATING RESEARCH COUNCIL, INC.
1 CONCOURSE PARKWAY, SUITE 800
ATLANTA, GA 30328
TEL: 678/795-0506 FAX: 678/795-0509
WWW.CRCAO.ORG

May 20, 2025
In reply, refer to:
CRC Project No. E-146

Dear Prospective Bidder:

The Coordinating Research Council (CRC) invites you to submit a written proposal to provide services for "***Literature Review on Evaluation of Mid-level Ethanol Blends (E16- E50); [an update to CRC Report No. E-97***]" (CRC Project No. E-146). A description of the project is presented in Exhibit A, "Statement of Work."

Please indicate your intention to bid at this link on or before **June 4, 2025** 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 at least one week before the proposal submission deadline here: Q & A Link. CRC will then return written answers to all of the bidders, along with a copy of the original questions. Questions submitted within a week of the deadline may not be answered before the proposal submission deadline.

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, exclusive of references and resumes or CVs.

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:

Amber Leland
Coordinating Research Council
1 Concourse Parkway, Suite 800
Atlanta, GA 30328

Phone: 678-795-0506
Fax: 678-795-0509
E-mail: **aleland@crcao.org**

The deadline for receipt of your proposal is **June 20, 2025**

Yours truly,

Amber B. Leland
Deputy Director

EXHIBIT A
CRC Project Statement of Work

"E-146: Literature Review on Evaluation of Mid-level Ethanol Blends (E16 to E50) [an update to CRC Report E-97]"

Leads: G. Lilik (EMTECH) and M. Przybylo (Toyota)

Background

SM-F-5 is a CRC project currently in review during the time of drafting this SOW. One objective of the project (SM-F-5) was to "examine opportunities to modify the current specifications for transportation fuels to enable fuels with a lower carbon intensity while remaining relevant to modern/future vehicles". A conclusion from this work was that "further study is recommended to determine what level of ethanol blends cause malfunction indicator light illumination for a wide variety of on-road vehicles, including late model vehicles sold after previous studies".

Prior to the introduction of E15, CRC conducted a variety of test programs to understand the effects of the increased ethanol content on the light duty vehicle fleet. This past work culminated in the E-97 summary report (see references). CRC has not conducted work on mid or high-level ethanol blends in ~10 years, therefore, the previous work did not include Tier 3 vehicles. Vehicle technology has since advanced while the motivations for incorporating lower carbon feed stocks have increased in recent years. Mid-level ethanol blends (MLEB) could enable higher-octane fuel, which has the potential to enable increased engine efficiency and further reduce carbon intensity for SI engines.

Objective

Perform a literature review -that will be used to scope the needs of a potential series of follow up projects that will identify enablers / barriers to introduce mid-level ethanol blends (E16 to E50) into the market (from the perspective of on-road vehicles, off-road engines and Infrastructure) and understand the overall benefit.

Scope of Work

Literature review to assess the progress since CRC last explored mid-level ethanol blends given that the gasoline pool has moved to 10% ethanol (in some areas even 15%). Additionally, examine the advancement of vehicle materials and technologies that would be affected by increased fuel ethanol content. This literature review will be used to guide vehicle emission and infrastructure studies in potential subsequent phases. The literature review will:

- Determine what portion of the current US fleet could handle mid-level ethanol blends and at what volume limit of ethanol, due to material compatibility or deviation in fuel properties
    - Minor focus on off-road gasoline engines (e.g. lawn mowers and generators) to ensure understanding of complete gasoline consuming ecosystem

- Determine what changes would be needed to enable current fleet (e.g., recalibration or elastomer swap, with insights on cost and feasibility)and the new production fleet for mid-ethanol blends.

- Similarly, minor focus on off-road gasoline engines (e.g. lawn mowers and generators) to ensure understanding of complete gasoline consuming ecosystem

- Inform needs for additional work/phases beyond this literature review. The following are potential directions for follow on projects.
  - Experimental study with Tier 3 (or Tier 4) vehicles to fill in gaps from previous studies
    - Vehicle performance aspect for consideration: driveability, exhaust emissions, evaporative emissions, flexible-fuel vehicles, onboard diagnostics, and durability of engine, fuel, and emissions control systems
  - Infrastructure and scalability study to understand the enablers / barriers and logistics to introduce mid-level ethanol blends into the market

Schedule

Expected to take 6 to 12 months, with a timeline to be developed by the contractor.

Deliverables

Kickoff

Project kickoff call with the contractor and CRC project panel. Contractor to suggest and align on timeline and content/topics of report. The following is an example for the Contractor to improve on:

- Executive summary with "dashboard" (see final report section below)
- Introduction / History
- Status of Mid-level Ethanol Blends
  - Fleet prospective
  - Infrastructure prospective
  - Specification and regulatory prospective
  - Availability of ethanol by type
- Recommendation for future work or next steps
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Monthly reports and updates

Hold monthly project review calls with the CRC project panel. The purpose of the calls is to update CRC panel members on project status and allow feedback on what topics are of greatest interest to better focus the results. Additionally, other project calls may be needed by either the contractor or CRC panel leadership.

Final report (written and presentation)

Written final report is to be drafted consistent with CRC guidelines. Develop an additional version of the report in the form of a presentation, that the contractor may be asked to present during a future Real-World Emissions Workshop.

The final report should include a list of literature references responsive to each topic of interest listed above, as well as a summary of findings related to each topic.

Also included in the final report will be an analysis of the literature. The analysis will culminate in an executive summary with a dashboard view (figures or tables) with a

breakdown summary of status, major challenges and or gaps to enable mid-level ethanol blends.

The CRC reporting process includes submitting a draft final report, review period for CRC panel members to review and comment on the draft, resolution of comments, and submission of the final report to CRC for publication on the CRC website.

References

- **CRC Report: E-87-1** MID-LEVEL ETHANOL BLENDS CATALYST DURABILITY STUDY SCREENING (JUNE 2009)
- **CRC Report: E-90-2b Interim** IMPACT OF ETHANOL BLENDS ON THE OBDII SYSTEMS OF IN-USE VEHICLES (NOVEMBER 2012)
- **CRC Report: E-90-2b** IMPACT OF ETHANOL BLENDS ON THE OBDII SYSTEM OF IN-USE VEHICLES (AUGUST 2013)
- **CRC Report: E-94-1** EVALUATION AND INVESTIGATION OF GASEOUS AND PARTICULATE EMISSIONS ON SIDI IN-USE VEHICLES WITH HIGHER ETHANOL BLEND FUELS (June 2014)
- **CRC Report: E-97** SUMMARY OF RESEARCH ON THE USE OF INTERMEDIATE ETHANOL BLENDS IN ON- ROAD VEHICLES (APRIL 2014)
- USDRIVE: Potential Impacts Of Increased Ethanol Blends-Level In Gasoline On Distribution And Retail Infrastructure (February 2019)

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 (Microsoft Word) 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).

The draft report must have appropriate editorial review corrections made by the contractor prior to submission to CRC to avoid obvious formatting, grammar, and spelling errors. The report should be written in a formal technical style employing a format that best communicates the work conducted, results observed, and conclusions derived. Standard practice typically calls for a CRC Title Page, Disclaimer Statement, Foreword/Preface, Table of Contents, List of Figures, List of Tables, List of Acronyms and Abbreviations, Executive Summary, Background, Approach (including a full description of all experimental materials and methods), Results, Conclusions, List of References, and Appendices as appropriate for the scope of the study. Reports submitted to CRC shall be written with a degree of skill and care customarily required by professionals engaged in the same trade and /or profession.

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 ten (10) hardcopies including a reproducible master copy of the final report. The final report shall also be submitted as electronic copies in a pdf and Microsoft Word 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.