



UNITED STATES ADVANCED BATTERY CONSORTIUM LLC

BATTERY ELECTRIFIED VEHICLE BENCHMARKING STUDY

REQUEST FOR PROPOSAL INFORMATION (RFPI)

July 2016

**RESPONSE REQUESTED BY,
October 17, 2016**

USABC BATTERY ELECTRIFIED VEHICLE BENCHMARKING STUDY

REQUEST FOR PROPOSAL INFORMATION (RFPI)

TABLE OF CONTENTS

1.0	Statement of Purpose/Objectives	3
2.0	Business Objectives	3
3.0	Project Timing	4
4.0	Business Case.....	4
5.0	Technical Challenges	4
6.0	Information Requested.....	4
6.1	Company Background	5
6.2	Proposed Benchmarking Test Plan	6
6.3	Proposed Program Schedule, Deliverables, and Cost	6
6.4	Cooperative Relationships.....	7
	RFPI AGREEMENT	8
	APPENDIX A - USABC Benchmarking Study on the Electrified Vehicle	9

USABC BATTERY ELECTRIFIED VEHICLE BENCHMARKING STUDY

REQUEST FOR PROPOSAL INFORMATION (RFPI)

1.0 Statement of Purpose/Objectives

The United States Advanced Battery Consortium (USABC) was formed in 1991 to sponsor development of advanced high-performance batteries for Electric Vehicle (EV) applications. USABC has carried out a number of battery development programs, focusing on low-cost, long-life, high-energy and high-power technologies. In 2012, the USABC started benchmarking studies of commercially available advanced battery systems from electrified vehicles. The USABC intends to continue these benchmarking studies through the issuance of this RFPI.

The purpose of this RFPI is to identify service providers having engineering capabilities and resources necessary to meet the USABC benchmarking study requirements listed in the attached **Appendix A**. The USABC is currently working under a cooperative agreement with the United States Department of Energy (USDOE) for the development of high performance batteries. The intended work of the subcontract in this RFPI is to benchmark the operation and performance of an advanced energy storage system on a state-of-the art electrified vehicle. This benchmarking may be comprised of vehicle level testing as well its component level testing and teardown. A credible testing plan with associated breakdown costs of each task must be provided. The test plan must meet all the USABC benchmarking goals.

The USABC intends to capitalize on the knowledge it has gained through this benchmarking study along with the HEV, PHEV, and EV battery research and development activities it engages in. We expect the engineering service providers to bring past experience and lessons learned from their battery and vehicle benchmarking work to bear on developing the test plan for this program.

2.0 Business Objectives

This USABC RFPI represents a unique opportunity for engineering providers to leverage their resources in combination with those of the automotive industry and the federal government. For the auto makers, this type of pre-competitive cooperation minimizes duplication of effort and risk of failure, and maximizes the benefits to the public from the government funds.

All service providers submitting proposals will be required to demonstrate that they have the potential to develop a viable testing plan, and provide engineering and testing support to meet the benchmarking requirements. At the time of submittal, all providers will be required to demonstrate required testing resources available for USABC inspection. Vehicle tests include

on-road and dynamometer (emissions) tests performed in accordance with conventional vehicle test procedures. Battery testing performed in accordance with the USABC battery test procedures is preferred, however not mandatory. On-site facility inspection by the USABC may be included in the selection process.

3.0 Project Timing

The proposals must be accompanied by a timing chart (Gantt chart) characterizing the following:

1. Length of time for on-road vehicle testing include vehicle procurement, break-in, instrumentation, and typical vehicle performance evaluations;
2. Length of time for vehicle dynamometer tests; and
3. Timeline for key component-level performance evaluations, teardown, and cost analysis, if required.

4.0 Business Case

The submittal must be accompanied by a business case, divided into two sections. The first section shall state the related experience and accessible testing resources of your organization with regard to the benchmarking testing requirements.

The second portion of the business case is to address the detailed instrumental and test plan, tasks, the associated cost and timeline, and anticipated data and summary, and the program deliverables when the program is finished.

5.0 Technical Challenges

Proposals should include a proposal on how the engineer provider plans to gain access to the data contained in the internal messaging bus(es) of the vehicle/test property.

Proposals may be accompanied by a clear description of any other technical challenges that the developer still needs to meet in order to deliver USABC's requests. A narration of the technical challenges that have already been met to reach the present requests will also be useful.

6.0 Information Requested

The information USABC is requesting from interested parties is specified in the following subsections. It includes: (1) a brief description of your company(s) background; (2) the benchmarking testing plan for the identified electrified vehicle; (3) the proposed program deliverables, timing, and cost; and (4) any formal or informal teaming arrangements planned.

USABC does not expect to award contracts on the sole basis of responses to this RFPI. All responses will be considered by representatives of the partners and other participants and will be ranked in order of merit. The submitters of the most promising proposals will be contacted by USABC to enter into negotiations which may lead to firm contractual arrangements. If the government and other funding become available, as now expected, USABC intends to award one contract. However, nothing herein should be interpreted as a commitment to award a contract.

Information requested below should be answered as thoroughly as possible within a maximum of twenty five pages, in total, for the response to the RFPI. Your submission package should be sent via electronic mail and shall contain a cover letter, a complete copy of your proposal and, a signed copy of the RFPI Agreement. If you have any questions concerning the RFPI, please contact Xiao Guang Yang @ (313) 805-5191 or Maureen LaHote @ (313) 910-3720.

NOTWITHSTANDING PROPOSER'S MARKINGS TO THE CONTRARY, ALL INFORMATION SUBMITTED IN RESPONSE TO THIS USABC RFPI SHALL BE TREATED ON A NON-CONFIDENTIAL BASIS.

ALL PROPOSALS ARE TO BE SUBMITTED TO THE CONSORTIUM IN ACCORDANCE WITH THE ATTACHED RFPI AGREEMENT WHICH MUST BE EXECUTED WITHOUT MODIFICATION AND ACCOMPANY THE PROPOSAL. NO PROPOSAL SHALL BE EVALUATED BY THE CONSORTIUM WITHOUT PRIOR EXECUTION OF SUCH RFPI AGREEMENT.

SEND, VIA ELECTRONIC MAIL, YOUR PROPOSAL (including signed RFPI Agreement) TO:

**Maureen LaHote
Business Manager
United States Advanced Battery Consortium
E-mail: mlahote@uscar.org**

6.1 Company Background

In order to become fully familiar with your company(s), the USABC needs information about your business. If your proposal is for a team, furnish the requested information for each company that makes up your team. Please answer/furnish the following information:

- Describe your company's structure, ownership, product lines, and customer base.

- Describe the resources (headcount, expenses, and facilities) devoted to benchmarking electrochemical energy storage technology and vehicles for the previous three years, currently, and forecasted through 2019.
- Provide a *brief* resume on key personnel to be dedicated to the project.

6.2 Proposed Benchmarking Test Plan

Electrified vehicle benchmarking testing will involve instrumentation and operation of the vehicle to provide recorded and subjective data. The data will be generated using a chassis dynamometer and road tests. Key component level testing will be conducted at specified conditions. The proposal must provide procedural details of how USABC technical criteria will be met including:

- Vehicle procurement and break-in
- Vehicle/component instrumental plan
- Vehicle-level performance evaluation including on a chassis dynamometer, and if offered, on road tests
- Component-level performance test, teardown and cost analysis of the battery pack, and other hardware if required
- Method for data delivery to the USABC

6.3 Proposed Program Schedule, Deliverables, and Cost

Proposal submitters shall clearly identify their benchmarking objectives. It is anticipated that there will be interaction between both parties in setting objectives and detailed testing conditions. If multiple companies will participate in the proposed test plan, the involvement of team member(s) from all organizations in the objectives setting process is strongly encouraged.

Submitters are expected to separately list the cost for each of the sub-tasks. Cost sharing from the company is *not* usually required for a benchmarking project. However, for the selection of the proposal, the USABC may take into consideration whether the company is domestic, foreign, or foreign controlled, benefits to US economy, and other factors.

Contractors will provide quarterly reports to USABC, including all test data and project progress. Due to the nature of the program, monthly meetings (online or in person) are beneficial for

USABC to track program progress. A final report and a full set of test data will be submitted to USABC at the end of the contract period.

6.4 Cooperative Relationships

The proposal should indicate any additional resources that may be required beyond those of the contractor to achieve program goals. This would include the development of cooperative relationships between component developers, component manufacturers, and subsystem integrators.

RFPI AGREEMENT

NOTWITHSTANDING PROPOSER'S MARKINGS TO THE CONTRARY, ALL INFORMATION SUBMITTED IN RESPONSE TO A UNITED STATES ADVANCED BATTERY CONSORTIUM (USABC) REQUEST FOR PROPOSAL INFORMATION (RFPI) SHALL BE TREATED ON A NON-CONFIDENTIAL BASIS.

AGREED:

BY _____

TITLE _____

PROPOSER _____

DATE _____



APPENDIX A - USABC Benchmarking Study on the Electrified Vehicle

Required Vehicle:

- 2016/17 US Market PHEV, contact Maureen LaHote for preferred vehicles.

The engineer provider will purchase the test vehicle. Please break down the cost of vehicle, all fees including license fees, importation if applicable, etc. Vehicle is not planned to be resold at the conclusion of the test. All parts will be either scrapped, or sent to one or more of the OEMs, if requested.

Powertrain Architecture:

The electrified vehicle may contain the follow features:

- A gasoline combustion engine
- A transmission
- An electric motor
- A lithium-ion battery (> 50 km e-drive range)

Benchmarking Study Scope:

The benchmarking study scope of the identified electrified vehicle includes at least the following key tasks

1. Vehicle-level road evaluations
2. Fuel Economy and standard emissions tests
3. Component-level analysis
 - Cell/pack performance
 - Battery pack cost analysis

Vehicle Instrumentation Requirements

CAN/analog data of Vehicle and/or subsystem are required to understand the full spectra of the performance of the following key machines but not limited to during vehicle and components operations. The potential contractors are recommended to include a list of parameters with units relevant to these key machines that would be recorded at detailed test conditions.

- Engine
- Transmission
- Electric machine

- High voltage battery
- High voltage DC/DC converter measurements
- Brake system
- Other systems:
 - Wheel
 - Steering wheel position
 - A/C conditioning unit
 - Shift
 - Power electronics cooling unit
 - Seat
 - Electric coolant pump
 - Low-voltage battery system etc.