Demonstration Funding for Automotive Technology Projects
With a Special Focus on Plug-in Hybrid Electric Vehicle RFP

Demonstration and Evaluation of Emerging Automotive Technologies with a focus on projects for:

1. After-market retrofit technologies that could achieve a 20% or greater improvement in fuel efficiency with similar reduction in emissions.
2. Other fuel efficient or electric vehicle advances that would improve performance, lower costs, extend range and/or address other important technical and cost barriers to electric, fuel-efficient or low emission vehicles.

This is intended to be a small grant program to assist Minnesota innovators in the demonstration of electric and other advanced vehicle technologies that will lower fuel use and reduce greenhouse gas emissions. Projects proposed are required to have proof of concept and pilot-scale research complete and be at the demonstration, verification or another more advanced stage of development and commercialization. (For clarification of these stages, see U.S. EPA’s R & D Continuum at: http://www.epa.gov/environmentaltechnology/continuum.html

Technologies within this focus area are expected to use commonly available, non-adulterated transportation fuels such as diesel, biodiesel, gasoline, ethanol and/or electricity as supplied by Minnesota’s existing fuel/energy delivery infrastructure. Proposals are being solicited for technologies that would be manufactured, assembled, or modified using components made by companies located in Minnesota. Of particular interest are projects with the potential to create manufacturing jobs in Minnesota.

Projects funded will be required to monitor, track and report the metrics included in the Testing Procedure for Demonstration Vehicles Receiving Grants identified on pages 6 and 7 of this document.

Minimum and Maximum Funding Award
Proposals will be accepted for grant requests of up to $50,000. Awarded funds will be dispersed periodically throughout the grant after specific milestones have been met and documented expense forms have been submitted. It is anticipated that 5-7 projects will be funded.

PROPOSAL INSTRUCTIONS

A. Proposal Content Requirements

1. Cover Page of Proposal and Eligibility
   Respondents must submit a cover page to their proposals that prominently displays:
   a) The demonstration project name.
   b) Full contact information (including email and phone number) for the primary technical person who will be responsible for the project.
   c) Full contact information for the primary administrative person who will be responsible for the project, if not the same; and
   d) A very brief abstract (no longer than 1 paragraph) that describes the project.

   This document must not include any proprietary or sensitive business information because OES may make it available to the public. The cover page does not count toward the proposal’s 6-page narrative maximum.

   2. Project Narrative
   The project narrative must not exceed 6 pages, not including cover page. Shorter proposals are encouraged.

   Any charts, graphs, diagrams, photographs, and other pictorial presentations are counted in the 6 page limit. Printed page size must fit standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). Evaluators will only review the 6 pages following the cover page. The font must be no smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. This document must not include any proprietary or sensitive business information as the Department may make this document available to the public. Proprietary or confidential technical information is not encouraged but if it is necessary to prove the technical merits of the technology, it can be sent as a separate attachment if that attachment is clearly marked confidential.
The project narrative must include:

- **Project Objectives.** This section should provide a clear, concise statement of the specific objectives/aims of the proposed project. It should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries. No more than 1 page.

- **Technical description of the technology with citation or reference to proof of concept.** Each proposal must be based on sound theoretical principles and explain how those principles will ensure the project is successful. **Reference all data and equations.**

- **Estimated fuel/energy savings and description of other benefits.** Include relevant performance indicators, or other metrics that this technology will achieve. Be sure to include data of the fuel savings potential. All analysis and modeling used to answer this section must be based on accepted engineering principles. It is strongly recommended that analysis be conducted using the method outlined in the following SAE Technical papers: Sovran, G., Blaser, D, “A Contribution to Understanding Automotive Fuel Economy and Its Limits,” SAE 2003-01-2070 and Tamai, G., et al, “Development of the Hybrid System for the Saturn VUE Hybrid,” SAE 2006-01-1502. **Reference all data and equations used.**

- **Description and brief assessment of target market (markets, size of market, cost requirements for that market, other consideration that may provide this tech with competitive advantage in that market.)** Estimate the amount of time it would take for the technology to pay for itself under anticipated market conditions (typically referred to as pay-back-period). Provide details.

- **Economic development potential for technology.** Briefly describe the stage of commercialization that the technology is currently at and plans for commercialization. Address whether the technology is expected to provide jobs in Minnesota and if so, what kinds of jobs and in what sectors?

Describe how you will measure and record the required vehicle testing parameters. See item 5. **Vehicle Testing Parameters** below. Fuel economy testing must follow SAE recommended practice J1082 “Fuel Economy Measurement Road Test Procedure”.

- **Project Tasks.** Tasks to be completed and a description on how tasks described in the RFP will be fulfilled with identification of primary participant(s) responsible for that task. Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate.

- **Project Timetable:** This section should outline as a function of time, month by month, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

- **Roles of Participants:** Describe principle participants and the work to be performed by each participant, include description of any business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

3. **Resumes/Biographical Information**

   (Resumes and Biographical Information will NOT be counted toward the 6-page proposal limit. Proposal must be in landscape or portrait format, 11 pt font minimum)

   Provide biographical information for each key person proposed, including subawardees and consultants if they meet the definition of key person. A key person is any individual who contributes in a substantive, measurable way to the execution of the project. The biographical information for all key participants when combined should not exceed 1 page when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font no smaller than 11 point and should include the following information, if applicable:
4. Budgets and Cost-share Information
(Limited to one page that will NOT be counted toward the 8-page proposal limit, in landscape or portrait format, 11 pt font or larger)

a. Cost-share Requirement and Eligible Cost-Share
The cost share provided by applicant must be at least 40% of the total allowable project costs and must come from sources other than the Minnesota Department of Commerce. Eligible Cost-Share can be in-kind or from matching dollars. Eligible matching dollars are funds not obtained through a grant program of the MN Department of Commerce (DOC), or committed for use as match for another grant. Eligible matching dollars may be provided from grant sources other than the DOC. Eligible cost-share includes capital and in-kind contributions such as the base vehicle used for the project, labor, material, travel and new equipment not paid for with Minnesota Office of Energy Security grant funds, and the use of existing equipment made unavailable for its dedicated purpose as required for the successful completion of the project.

Cost-share funds must be documented in writing as secured funding. Cost-share funds are considered identified and documented as secured in the following situations:
- The Applicant is providing all matching funds.
- The Applicant lists the amounts and source(s) of the match and submits written documentation (letters of support, agreements or resolutions) as proof of secured funding. (Documentation will not be counted toward the 6-page proposal)

Please make sure that your budget balances and that cost share meets the minimum 40% of the total project cost.
Total Project cost = Cost Share contribution + grant request.
Cost share / Total project cost = cost share %.

b. Eligible equipment costs include major parts and components associated with automotive vehicle technology or needed to build the demonstration vehicle, including plug-in electric conversion kits; but NOT including the base vehicle on which the equipment will be installed. It also includes PV equipment and components for renewable electric vehicle recharging systems.

c. Ineligible Costs
- Equipment or major components not considered part of the automotive technology system.
- The base vehicle that will be used for the project.
- The purchase of real property (land, real estate, easements or buildings).
- The cost of equipment not required for the successful completion of the project.
- The cost of activities initiated and costs incurred prior to execution of the grant agreement, with one accommodation: The applicant may request specific costs to count toward match that are incurred after the date applicants are notified whether they are selected for a grant, and the data of execution of a grant agreement. This allowance for unusually time-sensitive projects will be decided by the OES at its sole discretion.
- The cost of general operating support such as routine overhead expenses not related to the grant project.
- The cost of environmental or safety compliance or waivers.
- Legal services
- Communications, including by not limited to phones, computers, or mail expenses
- Travel or any travel related expenses including lodging, mileage reimbursement, etc.
- Meals, food or beverages of any kind

d. Budget Format
Budget by Task and total budget is required (provide a breakdown of anticipated project costs, such as for labor cost, equipment described as called for in Tasks, supplies, equipment, etc, for the amount of grant that you are requesting and for the cost-share that you will provide to the project. (Use categories and add new columns and rows- to reflect the budget that will be needed for the -activities specified in the Projects Tasks that you developed in the narrative section.)
Example for budget format:

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<th>Task 1 Grant Request</th>
<th>Task 1 Cost-share</th>
<th>Task 2 Grant Request</th>
<th>Task 2 Cost-share</th>
<th>Task 3 Grant Request</th>
<th>Task 3 Cost-share</th>
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5. Required Vehicle Testing Parameters
All funded demonstration vehicles must monitor, track and record the Vehicle Testing Parameters that are described in the following two pages titled TESTING PARAMETERS FOR DEMONSTRATION VEHICLES RECEIVING GRANTS on page 5.

PROPOSAL SELECTION CRITERIA

The following criteria will be used in the evaluation process to guide project selection:

Project description, benefits and impacts: 50 points
  • Technical description of project
  • Energy/fuel saving potential
  • Feasibility of technology to meet stated objectives
  • Completeness of engineering information and calculations
  • Economic development potential and other non-energy benefits of project

Budget: 20 points
  • Provision of complete cost breakouts
  • Cost-share amount compared to total grant request
  • Portion of budget directed to vehicle/technology parts, components, hardware, etc.

Applicant expertise, team and references: 15 points
  • Experience with automotive projects
  • Likelihood of applicant to successfully implement and complete project
  • Technical qualifications
  • References

Organization of Project 15 points
  • Clarity of Tasks outlined in the application
  • Delineation of reasonable project construction timeline

All proposals must include sufficient information to allow the above factors to be evaluated. Only applicants that furnish complete information will be considered for a grant. Partial proposals will not be considered.
TIMELINES AND SUBMISSION INFORMATION

Applications must be received by Friday, July 2nd, 2010 by 4:30 PM CST.

Submissions must follow “Application Process” described in section IV of this RFP to provide both:

1) One hard copy of the complete application and attachments, addressed to:

   Bruce Jones, PhD
   Director of the Minnesota Center for Automotive Research
   Trafton Science Center 205E
   Minnesota State University, Mankato
   Mankato, MN 56001

   And:

2) An electronic version of the application in Microsoft Word and attachments in Microsoft Word, Excel or Adobe PDF format must be e-mailed to: bruce.jones@mnsu.edu. Insert “(applicant’s name) - AD Grant Proposal” in the subject line.

Both 1) and 2) must be received by the above stated deadline.
ZIPPED files will not be accepted. Faxed submittals will not be accepted.

Number of Selected Projects for Funding in Focus Area III: Minnesota State University at Mankato’s project selection team anticipates funding 5-7 projects in this Focus Area. It expects that awards will be in the $25,000 range, with a maximum grant award set at $50,000. The number of projects within each focus area is only an estimate. Minnesota State University at Mankato’s project selection team will make final decisions on the number of projects to fund in each focus area guided by the number and quality of applications/proposals that it receives. Minnesota State University at Mankato’s project selection team reserves the right to move funding from one focus area to another.

Notification of Project Selection will be done no later than Wednesday, July 23rd, 2010, 4:00 PM CST: Applicants will be notified whether they are selected for an award by this date.

Deadlines

- Friday, July 2nd, 2010, 4:30 PM Central Standard Time: Proposals due date.
- Wednesday, July 23rd, 2010: Proposers will be notified whether they are selected for a grant
- The timeframe for all projects will be 1 year maximum.

Questions

All questions concerning this RFP should be submitted by June 21st, 2010 in writing to:

Bruce Jones, PhD
Director of the Minnesota Center for Automotive Research
Trafton Science Center 205E
Minnesota State University, Mankato
Mankato, MN 56001
bruce.jones@mnsu.edu
Focus Area III: Demonstration and Evaluation of Emerging Automotive Technologies

TESTING PARAMETERS FOR DEMONSTRATION VEHICLES RECEIVING GRANTS

Grant recipients will be required to collect the following performance data for their demonstration vehicles.

The goal of the data collection system will be to monitor vehicle system parameters (fuel usage, electrical usage, voltages, currents etc.) in addition to the measurement of the data associated with a plug-in application (energy used to recharge the batteries). The following is a compilation of the data items that vehicle demonstration projects should capture:

- Vehicle Identification Number
- Gasoline Purchase (Volume and Cost)
- Fuel Level Input
- Diagnostic Trouble Codes
- Distance Traveled Since Code Clear
- Vehicle Speed
- Engine RPM
- 12V Battery Voltage
- Ambient Air Temperature
- Barometric Pressure
- Relative Humidity
- Engine Coolant Temperature
- Current In/Out of Hybrid Battery Pack
- Hybrid Battery Pack Voltage
- Hybrid Battery Pack Temperature
- Hybrid Battery Pack Charger Current In
- Hybrid Battery Pack Charger Current Out
- Hybrid Battery Pack Plug In Battery Voltage

Performance of the vehicles in the grant program will need to be measured and recorded by the parties that are receiving funding. This data will be supplied to Minnesota Department of Commerce for data analysis and reporting.

The following list is the detailed list of data items that will be collected, the method used to gather the information and the reason the information will be collected.

- V.I.N. - To identify the recorded data with a specific vehicle to minimize confusion in emergencies. Obtain via communications with the data line of the OBD II Standard J1979.
- Gasoline Purchases- The only information the driver will need to record manually is gasoline purchases. There will be a log book to record the mileage at fill, per gallon cost, amount of fuel purchased and total cost.
- Fuel Level Input- One form of data that will help identify the amount of fuel used for calculating actual M.P.G. Obtain via communications with the data line of the OBD II Standard J1979.
- DTC- Not only the Number of codes set, but what code it is and a timestamp of when it occurred. Monitoring for this situation helps identify problems and/or possible reasons for decreased efficiency. Obtain via communications with the data line of the OBD II Standard J1979.
- Dist. Traveled Since Code Clear- To identify distances that the vehicle has traveled. Obtain via communications with the data line of the OBD II Standard J1979.
- Vehicle Speed- To identify vehicle speed and rate of acceleration for analysis. Obtain via communications with the data line of the OBD II Standard J1979.
- Engine RPM- To identify driving habits, vehicle load and efficiency and identify whether the engine is running or not while moving. Obtain via communications with the data line of the OBD II Standard J1979.
- 12V Battery V- Useful in identifying the load on the engine via the alternator and power available for the data recorder. Obtain via communications with the data line of the OBD II Standard J1979.
- Ambient Air Temp (Extended) - Not available on all vehicles, but if available, obtain to identify environment conditions for trends with battery voltage and engine on time. Obtain via communications with the data line of the OBD II Standard J1979.
- Baro- This information can be used later to identify trends in higher or lower pressures and vehicle efficiency. Obtain via communications with the data line of the OBD II Standard J1979.
- Engine Coolant Temp- For monitoring the vehicles engine and running temperatures. Method of measurement TBD.
- Current In/Out of Battery Pack- This information is vital to identify where the power is coming from and how quickly it is being used by the vehicle and driver.
- Pack Voltage- This information will be recorded at all times to monitor the amount of energy the vehicle stores, uses and gains.
- Pack Temperature- An important piece of information, particularly for a Plug In vehicle to ensure the battery pack is not over taxed. Obtained though CAN Network.
- Charger Current In- To identify the amount of power consumed by the vehicle while plugged into the electrical grid. Charger Current Out- To identify the amount of power available to the vehicle while plugged into the electrical grid.
- Plug In Battery Voltage- If an additional battery is added to the vehicle, the voltage will be monitored.