

US EPA ARCHIVE DOCUMENT

AGENCY: ENVIRONMENTAL PROTECTION AGENCY (EPA)

TITLE: "ENGINEERING EXCELLENCE THROUGH HYBRID TECHNOLOGY"

ACTION: Request for Applications (RFA)

RFA NO: OAR-OTAQ-08-09

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA) NO.: 66.034

DATES: The closing date and time for receipt of hard copy applications is **December 15, 2008, 4:00 p.m.**, Eastern Standard Time (EST). All hard copies of application packages must be received by Kimberly Derksen by **December 15, 2008, 4:00 p.m.** EST in order to be considered for funding. Electronic submissions must be submitted via <http://www.grants.gov/> by **December 15, 2008, 11:59 p.m., EST**. All applications, however transmitted, must be received in the Program Office by the closing date and time to receive consideration.

*To allow for efficient management of the competitive process, EPA requests eligible organizations submit an informal notice of "Intent to Apply" by **November 21, 2008**. Submission of an "Intent to Apply" is optional; it is a process management tool that will allow EPA to better anticipate the total staff time required for efficient review, evaluation, and selection of submitted proposals.*

SUMMARY: EPA is seeking applications from eligible entities to collaborate with EPA in studies and or investigation projects in support of EPA's Clean Automotive Technology Program. These pilot projects will require using state of the art experimental techniques in advanced engine development technology, including hydraulic hybrid drive-trains, to optimize Hydraulic Hybrid Vehicle (HHV) technology, unique clean and efficient engines for full-series hybrid vehicles and clean low-greenhouse gas transportation fuels while improving the fuel efficiency of highway vehicles in achieving its' mission meeting today's Clean Air Act standards and establishing the building blocks for future environmental and economic benefits.

Eligible entities with experience applying these investigative techniques that have achieved positive outcomes in increasing fuel efficiency and reducing emissions in hybrid vehicles to continue improving and demonstrating advanced hydraulic hybrid vehicle technology to meet Clean Air Act (CAA) emission standards and climate program goals are encouraged to apply. While the basis of this opportunity solicits support encompassing programmatic goals, it also includes the Merit Based PhD Program of Excellence where qualifying graduate students are provided the opportunity to conduct their program research in Partnership with the US EPA at its Ann Arbor National Laboratory which specializes in these fields of research.

FUNDING/AWARDS: The total estimated funding for this competitive opportunity shall not exceed \$1,350,000. EPA anticipates award of approximately two to five cooperative agreements, whose annual value shall not exceed \$450,000. The cooperative agreements will be funded incrementally. Additional funds may be added in each subsequent year of the agreement, subject to satisfactory performance and the availability of funds.

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SECTION I – FUNDING OPPORTUNITY DESCRIPTION

A. Background

For over 25 years, EPA's National Vehicle & Fuel Emissions Laboratory, a part of EPA's Office of Transportation and Air Quality (OTAQ), has led efforts to develop vehicles for future fuels that are clean, efficient, and affordable. Improving fuel efficiency offers a wide range of societal benefits such as lowering consumers' fuel expenditures, reducing US dependence on imported foreign oil, conserving capital for the US domestic economy, and reducing emissions of carbon dioxide, the most prevalent greenhouse gas. Understanding hydraulic hybrid vehicle technology is essential to reaching the goal of improving fuel efficiency and reducing greenhouse gas emissions. EPA's Clean Automotive Technology Program is leading the way towards development of hydraulic hybrid vehicles as a technology pathway that offers practical and cost-effective fuel efficiency improvements. EPA began its development of hydraulic hybrid vehicles in the mid-1990s with the goal of optimizing hydraulic components for highway vehicle applications. EPA has successfully demonstrated the viability of hydraulic hybrid vehicle technology for highway vehicle applications and is recognized as a world leader. EPA currently has cooperative research and development agreements (CRADAs) with private corporations - Ford Motor Company, Eaton Corporation, Parker-Hannifin, Navistar, and BorgWarner – with the goal of transferring this technology to the private sector for commercialization.

This project will relate to EPA's involvement with the Clean Automotive Technology Program as the investigation will require using state of the art experimental techniques in advanced engine development technology, including hydraulic hybrid drive-trains, to optimize Hydraulic Hybrid Vehicle (HHV) technology, unique clean and efficient engines for full-series hybrid vehicles and clean low-greenhouse gas transportation fuels while improving the fuel efficiency of highway vehicles. There are many areas where the identification of technical barriers and analysis of strategies to overcome those barriers could make hydraulic hybrids, their clean engines and alternative fuels more practical and cost effective. Some of the technologies being investigated include Plug-in Electric-Hydraulic Hybrids, Human Hydraulic Hybrids, hybrid drive-trains, small but highly-efficiency expansion turbines (e.g., steam turbines); high-efficiency, low-cost engines for full-series hybrid vehicle such as free-piston engines, high-efficiency gasoline (e.g. HCCI) combustion, low heat rejection engines with integrated exhaust waste-heat energy recovery systems targeted at 60+ percent thermal efficiency, and efficient use of alternative fuels.

B. Scope of Work

EPA's Clean Automotive Technology ("CAT") program is soliciting applications from eligible entities to collaborate with EPA in pilot projects to further optimize Hydraulic Hybrid Vehicle (HHV) technology, unique clean and efficient engines for full-series hybrid vehicles and clean lower greenhouse gas transportation fuels; as well as to increase graduate engineering human capital by supporting outstanding graduate students working in these areas.

This investigative project will require using state of the art experimental techniques in advanced engine development technology, including hydraulic hybrid drive-trains, to optimize Hydraulic Hybrid Vehicle (HHV) technology, unique clean and efficient engines for full-series hybrid vehicles and clean low-greenhouse gas transportation fuels while improving the fuel efficiency of highway vehicles. There are many areas where graduate student research into technical improvements could make hydraulic hybrids, their clean engines and alternative fuels more practical and cost effective.

Project Details

1. EPA's CAT program is interested in partnership(s) with one or more eligible entities to expand the fundamental scientific/engineering understanding and increase the undergraduate and graduate engineering human capital in areas of interest to the program. The partnership(s) will support outstanding graduate students performing studies and research in the fields of: (1) advanced/cost effective HHV technologies, (2) advanced clean, ultra-efficient and cost-effective engine/systems, (3) cost-effective and clean, renewable (or lower greenhouse gas (GHG) alternative) transportation fuels, in order to identify barriers to technological innovation and analyze innovative strategies to overcome these barriers. Establishing a merit-based process

for identifying qualified graduate students who would be provided the opportunity to conduct their program research in partnership with the U.S. EPA at its Ann Arbor National Laboratory which specializes in these fields of research is an essential element for this objective.

It is anticipated that up to 5 (or more) "Merit Based PhD Program of Excellence Graduate Scholars" will be supported in the above listed research fields per year.

2. As demonstrated by the CAT program's history of technological innovation and through EPA's study of all the transportation technologies that can be applied to reduce the environmental impact of societies transportation requirements, EPA's Office of Transportation and Air Quality has identified the following technical areas as particularly worthy of additional attention. Applicants should consider one or more of these project categories to investigate; however, we will consider independent suggestions regarding other areas worthy of further investigation.

EPA has determined the following as high priority specific technology projects:

- a. **Plug-in electric-hydraulic hybrids.** This area of investigation would require performance investigation of electric vehicle efficiency and synthesizing hybrid technology to optimize overall vehicle efficiency.
- b. **Human-hydraulic hybrids.** Human-powered vehicles, such as rickshaws, are used in many regions as a mode of basic transport. If these vehicles were constructed to be less difficult to propel, through leveling load requirements with a hydraulic hybrid energy storage device, demand for fossil-fuel vehicles would decrease.
- c. **Small (e.g., 10-50 kw) but high-efficiency expansion turbines (e.g., steam turbines).** This area of investigation would require efficiency optimization of small turbines.
- d. **Gasification of organics leading to synthesis of methanol, DME and potentially Fischer-Tropsch automotive fuels.** For the efficient use of alternative fuels to have an impact, there must be an efficient and reliable process for the production of these alternative fuels. This project will involve developing a gasification process for organics, leading to synthesis of methanol, DME and potentially Fischer-Tropsch automotive fuels.
- e. **Genetically engineered bacteria/enzymes that can convert organic materials to methanol cost-effectively.** Similar to the gasification research, this project investigates the use of bacteria or enzymes to create methanol for fuel usage.
- f. **Innovative aerodynamic improvement pathways for commercial and personal vehicles.** For personal and especially commercial series hybrid vehicles, engines are sized to provide required power during high-speed driving. One area of substantial potential efficiency benefit is decreasing the vehicle's aerodynamic resistance at highway speeds.
- g. **High-efficiency, low-cost engines for full-series hybrid vehicles such as free-piston engines, high-efficiency gasoline (e.g. HCCI) combustion, low heat rejection engines with integrated exhaust waste-heat energy recovery systems targeted at 60+ percent thermal efficiency.** The design of hybrid series hydraulic vehicles greatly modifies the demands on engine performance compared to traditional vehicles. The change produces an opportunity for innovative engine designs to increase overall vehicle efficiency.

Other project categories EPA is interested in include, but are not limited to, the following:

- **Low-permeation accumulator fluids and bladders (specifically bladders or gas-oil separation in general).** Current state-of-the-art materials used for accumulator bladders are subject to rates of gas permeation which, over long periods of time, can lower system effectiveness and possibly require "re-charging" of the charge gas, resulting in an added maintenance cost. This area would

involve a fundamental investigation and development of alternative (bladder or gas-oil separation) materials leading to the goal of essentially zero long-term permeation.

- **Filtration/de-aeration of hydraulic oil.** Gas permeation may lead to the presence of dissolved gas in the hydraulic fluid, which decreases its effectiveness and poses engineering difficulties. Also, “dry sump” pump/motors tend to cause aeration of fluid. For these reasons there is a need for a simple, inexpensive, and durable mechanism to de-aerate the hydraulic oil.
- **Low compressibility fluids.** This would involve a fundamental investigation of various fluids alternatives to conventional hydraulic oil, to determine whether there is an alternative fluid which would retain the advantages of hydraulic oil but have a lower compressibility.
- **High energy density mechanisms.** This would involve consideration of hydraulic energy storage options other than the different types of accumulators that have been used for decades in agricultural, construction, and industrial equipment.
- **Improving energy efficiency for engine-off accessories (air conditioning, power brakes, etc) through use of hydraulics to drive the accessories, and through enhanced performance based accessory designs.** This is important for two reasons. As drive train efficiency increases, accessories take a greater percentage of the energy needed to operate a vehicle. In addition, with hydraulic energy storage, it would be preferable to run accessories (such as power steering) with hydraulics, rather than off of the engine or battery power, especially if the engine management strategy dictates that the engine be shut off at times. This may involve investigation of engine management strategies.
- **Practical variable valve timing for pump/motors.** While EPA has investigated many areas that affect efficiency of hydraulic pump/motor designs, one additional area that holds promise for efficiency improvements over an expanded range of operation is variable valve timing for improving the flow-efficiency of pump/motor units. This would involve investigation of practical strategies and designs for pump/motor units with variable valve timing.

3. Applicants must address one or more of the above or other technical areas to focus on in their narrative proposals. Narrative proposals must: (1) address the methods, approaches, new technology and analysis necessary to obtain significant reduction in engine emissions and noise, and fuel economy advantage; (2) consist of such activities as studies, investigations, modeling, demonstrations, and similar activities; and (3) include the establishment of a merit-based process for identifying outstanding graduate students to perform these activities.

With our strong interest in developing focused workforce educational expertise in the engineering fields described, EPA recommends applicants give important consideration and emphasize how they will leverage their proximity to the National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor, MI, in their decision to compete for funding under this project. NVFEL is the site of the hydraulic hybrid “demonstration” vehicles and EPA’s advanced engine development activities, which will be used to integrate improvements developed by the recipients for collaboration with EPA, and is the primary location for EPA’s CAT program. Participants from the recipient organization will be required to travel frequently, or spend extended periods of time at NVFEL to complete the investigation and demonstration of their technological improvements.

C. EPA Strategic Plan Linkage and Anticipated Outcomes/Outputs

1. *Linkage to EPA Strategic Plan*

This project supports progress towards EPA’s 2006-2011 Strategic Plan’s Goal 1: **Clean Air and Global Climate Change**, “*Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced*”, Objective 1.5: Reduce Greenhouse Gas Emissions, *By 2012, 160 million metric tons of carbon equivalent (MMTCE) of emissions will be reduced through EPA’s voluntary climate protection*

programs, Objective 1.5.3: Reduce Greenhouse Gas Emissions: By 2012, 15 MMTCE will be reduced in the transportation sector.

This project supports EPA's efforts to develop advanced clean and fuel-efficient technology for a wide range of societal benefits including reducing our national dependence on imported oil, conserving capital for domestic economy and reducing carbon dioxide and greenhouse gas emissions. For more information on EPA's Strategic Plan, go to <http://www.epa.gov/ocfo/plan/plan.htm>.

2. Outcomes

The term "outcome" means the result, effect or consequence that will occur from carrying out an environmental program or activity that is related to an environmental or programmatic goal or objective. Outcomes may be environmental, behavioral, health-related, or programmatic in nature, but must be quantitative. They may not necessarily be achievable within an assistance agreement funding period.

Projects to be funded under this announcement are expected to produce at least one, and preferably all, of the following environmental outcomes: increasing fuel efficiency and reducing emissions in its hybrid vehicles to continue improving and demonstrating advanced hydraulic hybrid vehicle technology to meet Clean Air Act (CAA) emission standards and climate program goals.

3. Outputs

The term "output" means an environmental activity, effort, and/or associated work product related to an environmental goal and objective that will be produced or provided over a period of time or by a specified date. Outputs may be quantitative or qualitative but must be measurable during an assistance agreement funding period.

Project outputs should aim for a refinement of existing, and identification of new hydraulic hybrid components and systems needed to achieve ultra clean and efficient hybrid vehicles as well as expand the fundamental scientific/engineering understanding and increase the undergraduate and graduate engineering human capital in areas of interest to the program.

D. Supplementary Information

The statutory authority for this action is Clean Air Act, Section 103 (b)(3) which authorizes the award of grants for research, investigation, experiments, demonstrations, surveys and studies related to the causes, effects, extent, prevention and control of air pollution.

Demonstrations must involve new or experimental technologies, methods, or approaches, where the results of the project will be disseminated so that others can benefit from the knowledge gained in the demonstration project. A project that is accomplished through the performance of routine, traditional, or established practices, or a project that is simply intended to carry out a task rather than transfer information or advance the state of knowledge, however worthwhile the project might be, is not considered a demonstration project. Implementation activities are not eligible for funding under this announcement.

SECTION II – AWARD INFORMATION

A. What is the amount of available funding?

The total estimated funding for this competitive opportunity shall not exceed \$1,350,000. In FY2009, total funding shall not exceed \$450,000. The cooperative agreements will be funded incrementally. Additional funds may be added in each subsequent year of the agreement, subject to satisfactory performance and the availability of funds.

B. How many cooperative agreements will EPA award in this competition?

EPA anticipates award of approximately two to five cooperative agreements, whose total value shall not exceed \$1,350,000, subject to the availability of funds and quality of evaluated applications. In addition, EPA reserves the right to make additional awards under this announcement, consistent with Agency policy, if additional funding becomes available after the original selections. Any additional selections for awards will be made no later than six months from the date of original selection date.

C. Funding Type

The funding for selected projects will be in the form of a cooperative agreement. Cooperative agreements permit substantial involvement between the EPA Project Officer and the selected applicants in the performance of the work supported. Although EPA will negotiate precise terms and conditions relating to substantial involvement as part of the award process, the anticipated substantial Federal involvement for this project will be:

1. close monitoring of the successful applicant's performance to verify the results proposed by the applicant;
2. collaboration during performance of the scope of work;
3. quarterly technical discussions to determine if the best direction and sources of information on the latest efficient technologies are being utilized;
4. in accordance with 40 CFR 31.36(g), review of proposed procurement;
5. approving qualifications of key personnel (EPA will not select employees or contractors employed by the award recipient);
6. review and comment on reports prepared under the cooperative agreement (the final decision on the content of reports rests with the recipient)

D. What is the project period for awards resulting from this solicitation?

The estimated project period for awards resulting from this solicitation is August 1, 2009 through July 31, 2012. All projects must be completed within the negotiated project performance period of one to three years.

SECTION III – ELIGIBILITY INFORMATION

A. Eligible Entities

In accordance with CFDA 66.034, applications will be accepted from states, local governments, territories, Indian Tribes, and possessions of the U.S., including the District of Columbia, international organizations, public and private universities and colleges, hospitals, laboratories, other public or private nonprofit institutions.

Non-profit organization, as defined by OMB Circular A-122, means any corporation, trust, association, cooperative, or other organization which: (1) is operated primarily for scientific, educational, service, charitable, or similar purposes in the public interest; (2) is not organized primarily for profit; and (3) uses its net proceeds to maintain, improve, and/or expand its operations. For this purpose, the term "non-profit organization" excludes (i) colleges and universities; (ii) hospitals; (iii) state, local, and federally-recognized Indian tribal governments; and (iv) those non-profit organizations which are excluded from coverage of this Circular in accordance with paragraph 5 of the Circular.

Non-profit organizations described in Section 501(c)(4) of the Internal Revenue Code that engage in lobbying activities as defined in Section 3 of the Lobbying Disclosure Act of 1995 are not eligible to apply.

B. Cost-Sharing or Matching

Cost sharing or matching is not required as a condition of eligibility, or otherwise, for proposals selected for award.

C. Threshold Eligibility Criteria

These are requirements that if not met by the time of application submission will result in elimination of the application from consideration for funding. Only applications from eligible entities (see above) that meet the entire criteria will be evaluated against the ranking factors in Section V of this announcement. Applicants deemed ineligible for funding consideration as a result of the threshold eligibility review will be notified within 15 calendar days of the ineligibility determination.

1. a. Applications must substantially comply with the application submission instructions and requirements set forth in Section IV of this announcement or else they will be rejected. However, where a page limit is expressed in Section IV with respect to the application, pages in excess of the page limitation will not be reviewed.
b. In addition, applications must be received by the EPA or received through <http://www.grants.gov> as specified in Section IV of this announcement, on or before the application submission deadline published in Section IV of this announcement. Applicants are responsible for ensuring that their application reaches the designated person/office specified in Section IV of the announcement by the submission deadline.
c. Applications received after the submission deadline will be considered late and returned to the sender without further consideration unless the applicant can clearly demonstrate that it was late due to EPA mishandling or because of technical problems solely attributable to grants.gov and not the applicant. For hard copy submissions, where Section IV requires application receipt by a specific person/office by the submission deadline, receipt by an agency mailroom is not sufficient. Applicants should confirm receipt of their application with Kimberly Derksen as soon as possible after the submission deadline—failure to do so may result in your application not being reviewed.
2. Applications must support Goal 1: **Clean Air and Global Climate Change**, *“Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Objective 1.5: Reduce Greenhouse Gas Emissions, By 2012, 160 million metric tons of carbon equivalent (MMTCE) of emissions will be reduced through EPA’s voluntary climate protection programs. Objective 1.5.3: Reduce Greenhouse Gas Emissions: By 2012, 15 MMTCE will be reduced in the transportation sector.*
3. Applications must address in their narrative proposals one or more of the project categories listed in Part 2 of Section I, Scope of Work of this announcement.
4. Applications must address in their narrative proposals a plan for establishing a merit-based selection criteria for identifying qualified graduate students to pursue research in these areas.
5. Recipients will be required to spend extended periods of time at NVFEL, site of the hydraulic hybrid “demonstration” vehicles and EPA’s advanced engine development activities, to integrate improvements developed by the recipients for collaboration with EPA.
6. Hard copy applications will only be accepted by mail (via an express delivery service or by US postal mail). EPA will not accept applications submitted via fax or email.

SECTION IV – APPLICATION AND SUBMISSION INFORMATION

A. How to Obtain Application Package

EPA encourages applicants to obtain application materials and apply electronically through <http://www.grants.gov>.

Applicants may also download individual grant application forms from EPA’s Office of Grants and Debarment website at: http://www.epa.gov/ogd/grants/how_to_apply.htm or <http://www.epa.gov/ogd/AppKit/application.htm>

To obtain a hard copy of materials, please send an email or written request to the Agency contact listed in Section VII of this announcement.

B. Mode of Application Submission

Applicants have the option to submit their applications in *one of two ways*: 1) Hard copy via mail (express delivery or U.S. Postal Service), or 2) electronically via <http://www.grants.gov/> . Applications will not be accepted via email or fax. All applications must be prepared, and include the information as described in Section IV.C., regardless of mode of transmission.

1. Hard Copy Submission

Please provide two hard copy application packages (one original) including signed and completed SF 424 and SF 424A forms) and four copies as described in Section IV.C below.

Hard Copy via Express Delivery (FedEx, UPS, DHL, etc.) or U.S. Postal Service

U.S. Environmental Protection Agency
ATTN: Kimberly Derksen
OAR/OTAQ
2565 Plymouth Rd.
Ann Arbor, MI 48105

Hard Copy Application Submission Deadline

All hard copies of application packages must be received by Kimberly Derksen by December 15, 2008, 4:00 p.m., EST.

2. Grants.gov Submission

Your organization's AOR (Authorized Representative) **must** submit your complete application package as described below, electronically to EPA through Grants.gov (www.grants.gov) no later than **11:59 p.m. EST on December 15, 2008**. The electronic submission of your application must be made by an official representative of your institution who is registered with Grants.gov and is authorized to sign applications for Federal assistance. For more information, go to www.grants.gov and click on "Get Registered" on the left side of the page. The **registration process may take a week or longer to complete**. If not already registered, we encourage your organization to begin the registration process as soon as possible.

To begin the application process under this grant announcement, go to www.grants.gov and click on the "Apply for Grants" tab on the left side of the page. Then click on "Apply Step 1: Download a Grant Application Package" to download the compatible Adobe viewer and obtain the application package. **To apply through grants.gov you must use Adobe Reader applications and download the compatible Adobe Reader version ([Adobe Reader applications are available to download for free on the Grants.gov website](#). For more information on Adobe Reader please visit the [Help section](#) on grants.gov at www.grants.gov/help/help.jsp or www.grants.gov/aboutgrants/program_status.jsp).**

Once you have downloaded the viewer, you may retrieve the application package by entering the Funding Opportunity Number, **EPA-OAR-OTAQ-08-09**, or the CFDA number that applies to the announcement (CFDA 66.034), in the appropriate field. You may also be able to access the application package by clicking on the Application button at the top right of the synopsis page for this announcement on www.grants.gov (to find the synopsis page, go to www.grants.gov and click on the "Find Grant Opportunities" button on the left side of the page and then go to Search Opportunities and use the Browse by Agency feature to find EPA opportunities).

If you have any questions regarding Grants.gov, please email the Grants.gov Contact Center at support@grants.gov or call 1-800-518-4726.

Application Materials

An application package **must** include all Grant Application Forms (as listed below) and a comprehensive Narrative Proposal (as described in section IV.C of the announcement):

Grant Application Forms

- Standard Form 424, *Application for Federal Assistance*
- Standard Form 424A, *Budget Information – Non-Construction Programs*
- Standard Form 424B, *Non-Construction Programs*
- Standard Form LLL, *Pre-Award Disclosure of Lobbying Activities*
- EPA Form 4700-4, *Pre-Award Compliance Review Report for All Applicants Requesting Federal Financial Assistance*
- EPA Form 5700-54, *Key Contacts Form*

Narrative Proposal

The narrative proposal should be readable in Adobe Acrobat PDF for Windows and consolidated into a single file and be prepared in accordance with Section IV.C of the announcement.

The **Grant Application Forms** listed above listed under Application Materials should appear in the “Mandatory Documents” box on the <http://www.grants.gov/> “Grant Application Package” page. Click on the appropriate forms and then click “Open Form” below the box. The fields that must be completed will be highlighted in yellow. Optional fields and completed fields will be displayed in white. If you enter an invalid response or incomplete information in a field, you will receive an error message. When you have finished filling out each form, click “Save.” When you return to the electronic “Grant Application Package” page, click on the form you just completed, and then click on the box that says, “Move Form to Submission List.” This action will move the document over to the box that says, “Mandatory Completed Documents for Submission.”

The **Narrative Proposal**, will require attachment of electronic files. Prepare your narrative proposal as described in Section IV.C of this announcement and save the document(s) to your computer as a PDF file. When you are ready to attach your narrative proposal to the “grant application package”, click on “Project Narrative Attachment Form,” and open the form. Click “Add Mandatory Project Narrative File,” and then attach your narrative proposal (previously saved to your computer) using the browse window that appears. You may then click “View Mandatory Project Narrative File” to view it. Enter a brief descriptive title of your project in the space beside “Mandatory Project Narrative File Filename;” the file name should be no more than 40 characters long. If there other attachments that you would like to submit to accompany your application, you may click “Add Optional Project Narrative File” and proceed as before. When you have finished attaching the necessary documents, click “Close Form.” When you return to the “Grant Application Package” page, select the “Project Narrative Attachment Form” and click “Move Form to Submission List.” The form should now appear in the box that says, “Mandatory Completed Documents for Submission.”

Once your entire application package (signed grant application forms and a complete narrative proposal) has been saved, send it to your Authorized Representative (AOR) for submission to U.S. EPA via www.grants.gov. Please advise your AOR to close all other software programs before attempting to submit the application package through grants.gov.

In the “Application Filing Name” box, your AOR should enter your organization’s name (abbreviate where possible), the fiscal year (e.g., FY09), and the grant category (e.g., Assoc Prog Supp). The filing name should not exceed 40 characters. From the “Grant Application Package” page, your AOR may submit the application package by clicking the “Submit” button that appears at the top of the page. The AOR will then be asked to verify the agency and

funding opportunity number for which the application package is being submitted. If problems are encountered during the submission process, the AOR should reboot their computer before trying to submit the application package again. [It may be necessary to turn off the computer (not just restart it) before attempting to submit the package again.] **If the AOR continues to experience submission problems, they may contact grants.gov for assistance by phone at 1-800-518-4726 or email at www.grants.gov/help/help.jsp.**

Application packages submitted via www.grants.gov will be time/date stamped electronically.

C. Content of Application Package Submission

All application submissions, regardless of mode of submission, must contain completed and signed application forms, as well as a Narrative Proposal, as described below.

Grant Application Forms. Please be sure to include organization fax number and email address in Block 5 of the Standard Form SF 424. The forms are available at <http://www.epa.gov/ogd/forms/forms.htm>.

- Standard Form 424, *Application for Federal Assistance*
- Standard Form 424A, *Budget Information – Non-Construction Programs*
- Standard Form 424B, *Non-Construction Programs*
- Standard Form LLL, *Pre-Award Disclosure of Lobbying Activities*
- EPA Form 4700-4, *Pre-Award Compliance Review Report for All Applicants Requesting Federal Financial Assistance*
- EPA Form 5700-54, *Key Contacts Form*

Narrative Proposal

The narrative proposal must be limited to no more than twenty-four (24) typewritten **double-spaced** 8.5 x 11 inch pages (a page is one side of paper). Pages should be consecutively numbered for ease of reading. It is recommended that applicants use a standard 12-point type with 1-inch margins. While these guidelines establish the minimum type size recommended, applicants are advised that readability is of paramount importance and should take precedence in selection of an appropriate font for use in the proposal narrative. Additional pages beyond the 24 page limit will not be considered.

1. Cover Page (not counted in page limit)

- a. Project title
- b. Name of applicant;
- c. List of all potential partners associated with the project;
- d. Key personnel and contact information (i.e., e-mail address and phone number);
- e. Total project cost and federal dollars requested; and
- f. Abstract/project summary: Provide a brief description of the proposed project.

2. Narrative Proposal

The Narrative Proposal must explicitly describe how the proposed project meets the guidelines established in Sections I-III (including the threshold eligibility criteria in Section III.C) of this announcement, and must address each of the evaluation criteria set forth in Section V.

- a. Detailed project summary, description of specific actions and methods to be undertaken and the responsible institutions, including estimated time line for each task;
- b. A selection criteria plan for selecting qualified graduate students the opportunity to conduct their program research in partnership with EPA's Ann Arbor National Laboratory.
- c. Description of the associated work products to be developed (e.g. partnership agreements, if any);
- d. An explanation of project benefits to the public;

- e. An explanation of how project outcomes (e.g., fuel economy and emissions benefits) will be designed for reinvestment;
- f. A detailed explanation of how project success will be evaluated; (*Refer to Section V(A), Evaluation Criteria, "Performance Measurement."*)
- g. A description of the roles of the applicant and partners, if any;
- h. Concise biographical information on key personnel identified;
- i. Description of applicant's organization and experience related to this project;
- j. Plan for timely and successful achievement of project objectives;
- k. Description of staff expertise/qualifications, staff knowledge, and resources or the ability to obtain them, to successfully achieve the goals of the project;
- l. Project Milestone schedule detailing a projected timeline for the proposed project period (up to three years for the cooperative agreement and one to three years for the subgrants). The project start date will follow acceptance of the award by the successful applicant. The timeline should show timeframes and major milestones to complete significant project tasks including, but not limited to, major annual outreach activities, release of the subgrant RFA, and the approximate time of award of the subgrants.
- m. Established Baseline for Measurement - Describe what baseline will be used to determine whether the project resulted in environmental improvement (i.e., current condition).

3. Detailed Budget Narrative

Provide a detailed budget and estimated funding amounts for each project component/task. Include necessary resources for students to travel and perform project research at the NVFEL in Ann Arbor, MI. Also include any travel for applicant staff to attend meetings throughout the proposed project period to promote "Excellence in Engineering through Hybrid Technology" or to increase subgrantee applications. Describe each item in sufficient detail for EPA to determine the reasonableness and allowability of costs. This section provides an opportunity for narrative description of the budget or aspects of the budget found in Standard Form 424A such as "other" and "contractual". (All subgrant funding should be located under the "other" cost category.) Total costs should include both federal and any cost share/match (non-federal) components.

Management Fees: When formulating budgets for proposals/applications, applicants must not include management fees or similar charges in excess of the direct costs and indirect costs at the rate approved by the applicants cognizant audit agency, or at the rate provided for by the terms of the agreement negotiated with EPA. The term "management fees or similar charges" refers to expenses added to the direct costs in order to accumulate and reserve funds for ongoing business expenses, unforeseen liabilities, or for other similar costs that are not allowable under EPA assistance agreements. Management fees or similar charges may not be used to improve or expand the project funded under this agreement, except to the extent authorized as a direct cost of carrying out the scope of work.

***Selected applicant(s) will need to submit a copy of their current indirect cost rate that has been negotiated with a federal cognizant agency.**

4. Environmental Results—Outcomes and Outputs

Identify the expected quantitative and qualitative outcomes and environmental improvements to be accomplished as a result of this project (**See Section I**), including what measurements will be used to track your progress towards achieving the outcomes and how the results of the project will be evaluated.

Identify the expected project outputs (products/results) which are expected to be achieved from accomplishment of the project and an approach for measuring and tracking your progress toward achieving the expected project output(s)

5. Past Performance

I. Programmatic Capability: Submit a list of federally funded assistance agreements (**assistance agreements include Federal grants and cooperative agreements but not Federal contracts**) similar in size, scope and relevance to the proposed project that your organization performed within the last three years (no more than 5, and preferably EPA agreements) and describe (i) whether, and how, you were able to successfully complete and manage those agreements and (ii) your history of meeting the reporting requirements under those agreements including submitting acceptable final technical reports.

*In evaluating applicants under these factors in Section V, EPA will consider the information provided by the applicant and may also consider relevant information from other sources, including information from EPA files and from current and prior Federal agency grantors (e.g., to verify and/or supplement the information provided by the applicant). If you do not have any relevant or available past performance or reporting information, please indicate this in the narrative proposal and you will receive a neutral score for these factors under Section V. If you do not provide any response for these items, you may receive a score of 0 for these factors.

II. Reporting on Environmental Results--Outcomes and Outputs: Submit a list of federally funded assistance agreements (**assistance agreements include Federal grants and cooperative agreements but not Federal contracts**) that your organization performed within the last three years (no more than 5, and preferably EPA agreements), and describe how you documented and/or reported on whether you were making progress towards achieving the expected results (e.g., outputs and outcomes) under those agreements. If you were not making progress, please indicate whether, and how, you documented why not.

*In evaluating applicants under this factor in Section V, EPA will consider the information provided by the applicant and may also consider relevant information from other sources, including information from EPA files and from current and prior Federal agency grantors (e.g., to verify and/or supplement the information provided by the applicant). If you do not have any relevant or available environmental results past performance information, please indicate this in the narrative proposal and you will receive a neutral score for this factor under Section V. If you do not provide any response for these items, you may receive a score of 0 for these factors.

D. Can funding be used for the applicant to make subawards, acquire contract services, or fund partnerships?

Funding may be used to provide subgrants or subawards of financial assistance, which includes using subawards or subgrants to fund partnerships, provided the recipient complies with applicable requirements for subawards or subgrants including those contained in 40 CFR Part 30 or 31, as appropriate. Applicants must compete contracts for services and products, including consultant contracts, and conduct cost and price analyses, to the extent required by the procurement provisions of the regulations at 40 CFR Part 30 or 31, as appropriate. The regulations also contain limitations on consultant compensation. Applicants are not required to identify subawardees/subgrantees and/or contractors (including consultants) in their proposal. However, if they do, the fact that an applicant selected for award has named a specific subawardee/subgrantee, contractor, or consultant in the proposal EPA selects for funding does not relieve the applicant of its obligations to comply with subaward/subgrant and/or competitive procurement requirements as appropriate. Please note that applicants may not award sole source contracts to consulting, engineering or other firms assisting applicants with the proposal solely based on the firm's role in preparing the proposal.

Successful applicants cannot use subgrants or subawards to avoid requirements in EPA grant regulations for competitive procurement by using these instruments to acquire commercial services or products from for-profit organizations to carry out its assistance agreement. The nature of the transaction between the recipient and the subawardee or subgrantee must be consistent with the standards for distinguishing between vendor transactions and subrecipient assistance under Subpart B Section .210 of OMB Circular A-133, and the definitions of subaward at 40 CFR 30.2(ff) or subgrant at 40 CFR 31.3, as applicable. EPA will not be a party to these transactions. Applicants acquiring commercial goods or services must comply with the competitive

procurement standards in 40 CFR Part 30 or 40 CFR 31.36 and cannot use a subaward/subgrant as the funding mechanism.

E. How will an applicant's proposed subawardees/subgrantees and contractors be considered during the evaluation process described in Section V of the announcement?

Section V of the announcement describes the evaluation criteria and evaluation process that will be used by EPA to make selections under this announcement. During this evaluation, except for those criteria that relate to the applicant's own qualifications, past performance, and reporting history, the review panel will consider, if appropriate and relevant, the qualifications, expertise, and experience of:

(i) an applicant's named subawardees/subgrantees identified in the proposal/application if the applicant demonstrates in the proposal/application that if it receives an award that the subaward/subgrant will be properly awarded consistent with the applicable regulations in 40 CFR Parts 30 or 31. For example, applicants must not use subawards/subgrants to obtain commercial services or products from for profit firms or individual consultants.

(ii) an applicant's named contractor(s), including consultants, identified in the proposal/application if the applicant demonstrates in its proposal/application that the contractor(s) was selected in compliance with the competitive Procurement Standards in 40 CFR Part 30 or 40 CFR 31.36 as appropriate. For example, an applicant must demonstrate that it selected the contractor(s) competitively or that a proper non-competitive sole-source award consistent with the regulations will be made to the contractor(s), that efforts were made to provide small and disadvantaged businesses with opportunities to compete, and that some form of cost or price analysis was conducted. EPA may not accept sole source justifications for contracts for services or products that are otherwise readily available in the commercial marketplace.

EPA will not consider the qualifications, experience, and expertise of named subawardees/subgrantees and/or named contractor(s) during the proposal/application evaluation process unless the applicant complies with these requirements.

F. Submission Dates and Times

1. To allow for efficient management of the competitive process, EPA requests eligible entities submit an informal notice of **"Intent to Apply"** by **November 21, 2008**, to the agency contact identified under *Section VII, Agency Contact*. Submission of an "Intent to Apply" is optional; it is a process management tool that will allow EPA to better anticipate the total staff time required for efficient review, evaluation, and selection of submitted proposals. Eligible entities not submitting an "Intent to Apply" are still eligible to apply by the closing date and time. The written notice of "Intent to Apply" may be submitted via electronic mail to derksen.kimberly@epa.gov. Please provide the name of your organization, a point of contact, phone number, email address, and the title of your project.
2. Completed **Application submissions sent by hard copy with CD** must be received by the Agency Contact identified in Section IV.B.1 by **4:00 PM EST on December 15, 2008**. Applications submitted electronically via **Grants.gov**, <http://www.grants.gov/>, must be submitted by **11:59 P.M December 15, 2008**. Applications received after the closing date and time will not be considered for funding.

G. Confidential Business Information

In accordance with 40 CFR 2.203, applicants may claim all or a portion of their application package as confidential business information. EPA will evaluate confidential claims in accordance with 40 CFR Part 2. Applicants must clearly mark applications or portions of applications they claim as confidential. If no claim of confidentiality is made, EPA is not required to make the inquiry to the applicant otherwise required by 40 CFR 2.204 (c) (2) prior to disclosure. Note that under Public Law No. 105-277, data produced under an award is subject to the Freedom of Information Act.

H. Pre-Application Assistance and Communications

In accordance with EPA's Assistance Agreement Competition Policy (EPA Order 5700.5A1), EPA staff will not meet with individual applicants to discuss draft application packages, provide informal comments on draft narrative proposals, or provide advice to applicants on how to respond to ranking criteria. Applicants are responsible for the contents of their applications. However, EPA will respond to questions in writing from individual applicants regarding threshold eligibility criteria, administrative issues related to the submission of the application, and requests for clarification about the announcement.

SECTION V – APPLICATION REVIEW INFORMATION

A. Evaluation Criteria

Only eligible entities whose application(s) meet the threshold criteria in Section III of this announcement will be reviewed according to the evaluation criteria set forth below. Applicants that directly and explicitly address the evaluation criteria below will have a greater likelihood of being selected for award. Each application will be rated under a points system, with a total of 100 points possible.

Criteria	Maximum Points Per Criterion
<p>1. Project Summary/Approach: Under this criterion, the Agency will evaluate the following factors: (i) (10 pts) the extent and quality to which the narrative proposal includes a well-conceived strategy for project collaboration with EPA to further optimize Hydraulic Hybrid Vehicle (HHV) technology in expanding the fundamental scientific/engineering understanding and increasing the graduate engineering technology projects while addressing all the requirements in Section I, Part B (Scope of Work) and Part C (EPA Strategic Plan Linkage and Anticipated Outcomes/Outputs), (ii) (5 pts) the extent and quality to which the proposal's goals are realistic and will be actually implemented by project end, (iii) (5 pts) whether the proposal sets forth a reasonable time schedule for the execution of the tasks associated with the project(s).</p>	<p>20</p>
<p>2. Environmental Results—Outcomes and Outputs: Under this criterion, the Agency will evaluate the effectiveness of the applicant's, (i) (10 pts) plan for tracking and measuring its progress toward achieving expected project outputs and outcomes, including those identified in Section I of this announcement, and (ii) (5 pts) a description of design concept(s) for improving vehicle fuel economy and reducing gas emissions with planning of the process to produce data/results demonstrating the effectiveness of the design concept(s).</p>	<p>15</p>
<p>3. Programmatic Capability and Reporting on Environmental Results: Under this criterion, the Agency will evaluate the applicant's technical ability to successfully complete and manage the proposed project taking into account the applicants: (i) (9 pts) past performance in successfully completing and managing federally funded assistance agreements (assistance agreements include Federal grants and cooperative agreements but not Federal contracts) similar in size, scope, and relevance to the proposed project performed within the last 3 years, (ii) (8 pts) history of meeting reporting requirements on federally funded assistance agreements (assistance agreements include Federal grants and cooperative agreements but not Federal contracts) similar in size, scope, and relevance to the proposed project performed within the last 3 years and submitting acceptable final technical reports under those agreements, and (iii) (8 pts) past performance in documenting and/or reporting on progress towards achieving the expected outcomes and outputs (e.g., results) under federally funded assistance agreements (assistance agreements include Federal grants and cooperative agreements but not Federal contracts) similar in size, scope and relevance to the proposed project within the last 3 years; and, if such progress was not made whether the documentation and/or reports satisfactorily explained why not.</p> <p>NOTE: In evaluating applicants under this criterion, the Agency will consider the information provided by the applicant and may also consider relevant information</p>	<p>25</p>

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from other sources including agency files and prior/current grantors (e.g., to verify and/or supplement the information supplied by the applicant). Applicants with no relevant or available past performance or reporting history will receive a neutral score for those elements under this criterion. A neutral score is half of the total points available in a subset of possible points. If you do not provide any response for these items, you may receive a score of 0 for these factors.	
4. Staff Expertise/Qualifications: Under this criterion, the Agency will evaluate the (i) (5 pts) description of staff expertise/qualifications and extent in managing similar programs, staff knowledge, and resources or the ability to obtain them, to successfully achieve the goals of the proposed project, (ii) (5 pts) description of the applicant’s organization and experience relating to the proposed project, (iii) (5 pts) and applicant’s selection criteria plan for selecting qualified graduate students the opportunity to conduct their program research in partnership with the EPA’s NVFEL in Ann Arbor, MI.	15
5. Budget/Resources: Under this criterion, the Agency will consider whether the budget is clearly stated, detailed, and appropriate to achieve the project’s objectives (i) (5 pts) Whether the proposed project budget is appropriate to accomplish the proposed goals, objectives, and measurable environmental outcomes, (ii) (5 pts) whether the budget provides an approximation of the percentage of the budget designated for each major activity, and (iii) (5 pts) whether the budget provides resources available for students to travel and perform project research at the NVFEL in Ann Arbor, MI.	15
6. Location: Under this criterion, the Agency will evaluate the following factor: (i) (10 pts) the extent to which the applicant’s physical location will affect its ability to successfully achieve the objectives of this announcement, specifically spending extended periods of time at NVFEL, site of the hydraulic hybrid “demonstration” vehicles and EPA’s advanced engine development activities, as described in Section I.	10

B. Other Factors

EPA reserves the right to make award decisions based on factors that help ensure geographic equity and demonstration of a variety of technical approaches. In addition, EPA reserves the right to make additional awards under this announcement, consistent with Agency policy, if additional funding becomes available after the original selections. Any additional selections for awards will be made no later than six months from the date of original selection date. Once final decisions have been made, a funding recommendation will be developed and forwarded to the EPA Award Official.

C. Review and Selection Process

Applications will first be evaluated against threshold factors listed in Section III. Each application which meet all the threshold factors will be evaluated by a team chosen to address the range of activities associated with hydraulic hybrid vehicle technology developments and air quality. Each application will be given a numerical score and will be rank-ordered according to the numerical score.

Preliminary funding recommendations will be provided to a Selection Committee based on this ranking. The highest numerically-ranked proposal(s) (subject to the quality of proposals, availability of funds, and consideration of *Section V(B), Other Factors*) will be recommended for award.

SECTION VI – AWARD ADMINISTRATION INFORMATION

A. Award Notices

Following final selections, EPA anticipates notification of successful and unsuccessful applicants by January 15, 2009. This notice will not be an authorization to begin performance. The EPA Grant Award Officer is the

only official that can bind the Agency to the expenditure of funds for selected projects resulting from this announcement.

EPA reserves the right to negotiate and/or adjust the final grant amount and workplan prior to award, as appropriate and consistent with Agency policy, including EPA's Competition Policy (EPA Order 5700.5A1). An approvable final workplan is required to include:

1. Workplan components to be funded under the assistance agreement;
2. Estimated work years and the estimated funding amounts for each workplan component;
3. Workplan commitments for each workplan component and a timeframe for their accomplishment;
4. Performance evaluation process and reporting schedule; and
5. Roles and responsibilities of the recipient and EPA (for cooperative agreements only) in carrying out the workplan commitments.

In addition, the successful applicant and their partners will be required to certify that they have not been Debarred or Suspended from participation in federal assistance awards in accordance with 40 CFR Part 32.

B. Administrative and National Policy Requirements

A listing and description of general EPA Regulations applicable to the award of assistance agreements may be viewed at: http://www.epa.gov/ogd/AppKit/applicable_epa_regulations_and_description.htm.

Executive Order 12372, Intergovernmental Review of Federal Programs may be applicable to awards, resulting from this announcement. Applicants selected for funding may be required to provide a copy of their application to their [State Point of Contact](#) (SPOC) for review, pursuant to Executive Order 12372, Intergovernmental Review of Federal Programs. This review is not required with the Initial Application and not all states require such a review.

C. DUNS Number

All applicants **are required** to provide a Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number when applying for a Federal grant or cooperative agreement. Applicants can receive a DUNS number, at no cost, by calling the dedicated toll-free DUNS Number request line at 1-866-705-5711, or visiting the D&B website at: <http://www.dnb.com>.

D. Reporting Requirement

Submission of quarterly progress reports to the EPA Project Officer within thirty days after each reporting period will be required. These reports shall cover work status, work progress, difficulties encountered, preliminary data results and a statement of activity anticipated during the subsequent reporting period, including a description of equipment, techniques, and materials to be used or evaluated. A discussion of expenditures along with a comparison of the percentage of the project completed to the project schedule and an explanation of significant discrepancies shall be included in the report. The report shall also include any changes of key personnel concerned with the project. A detailed final technical report will be required and shall be completed within 90 calendar days of the completion of the period of performance.

E. Disputes

Assistant agreement competition-related disputes will be resolved in accordance with the dispute resolution procedures published in 70 FR (Federal Register) 3629, 3630 (January 26, 2005) located on the web at: http://frwebgate.access.gpo.gov/cgi-bin/getpage.cgi?position=all&page=3629&dbname=2005_register

F. Non-profit Administrative Capability

Non-profit applicants that are recommended for funding under this announcement are subject to pre-award administrative capability reviews consistent with Section 8b, 8c and 9d of EPA Order 5700.8 - Policy on Assessing Capabilities of Non-Profit Applicants for Managing Assistance Awards (http://www.epa.gov/oqd/grants/award/5700_8.pdf). In addition, non-profit applicants that qualify for funding may, depending on the size of the award, be required to fill out and submit to the Grants Management Office the Administrative Capabilities Form, with supporting documents, contained in Appendix A of EPA Order 5700.8.

SECTION VII – AGENCY CONTACT

Pre-Application Assistance and Communications

In accordance with EPA's Assistance Agreement Competition Policy (EPA Order 5700.5A1), EPA staff will not meet with individual applicants to discuss draft application packages, provide informal comments on draft narrative proposals, or provide advice and/or guidance to applicants on how to respond to ranking criteria. Applicants are responsible for the contents of their proposals. However, consistent with the provisions in this announcement, EPA will respond to questions from individual applicants regarding threshold eligibility criteria, administrative issues related to the submission of their application, and requests for clarification about the announcement. Questions or comments must be communicated in writing via postal mail, facsimile, or electronic mail to the contact person identified below. Answers will be posted, bi-weekly, until the closing date of this announcement at the OAR Grants/Funding webpage (http://www.epa.gov/air/grants_funding.html).

Agency Contact

Kimberly Derksen

E-mail: derksen.kimberly@epa.gov

U.S. EPA, Office of Transportation and Air Quality

2565 Plymouth Rd.

Ann Arbor, MI 48105

Fax (734) 214-4573

SECTION VIII – OTHER INFORMATION

A. After final selections and award of the resultant cooperative agreements, EPA will provide an introductory briefing to all selected recipients summarizing the current state-of-the-art of hydraulic hybrid drive-trains, and a list of technical areas where EPA believes that further technical advancements are desirable. If appropriate for the selected fields of investigation, EPA may provide a “demonstration” vehicle— probably a large sport utility vehicle – which can be used to demonstrate improvements developed by the recipients for evaluation by EPA.