

US EPA ARCHIVE DOCUMENT

**AGENCY:** ENVIRONMENTAL PROTECTION AGENCY (EPA)

**TITLE:** “Engineering Excellence Through Hybrid Technology”

**ACTION:** Request for Applications (RFA)

**RFA:** EPA-OAR-OTAQ-08-09

**CFDA:** 66.034

**SUMMARY:** Formal Agency responses to questions regarding the subject RFA

**DATE:** December 1, 2008

**Q1: Can you tell me if this application is open to 'for profit' entities?**

**A1:** No. For Profit entities are not eligible. 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.

Non-profit organizations that are eligible and wish to apply should follow instructions as indicated in the RFA.

**Q2. *Would we need to partner with a non-profit entity like a university?***

***If we need to partner with a non-profit entity, does the non-profit entity need to submit the application or can a “For Profit” submit the application?***

**A2.** An application submitted by a “For Profit” entity would be ineligible. It is up to applicants (ie: For Profit companies) to determine how to qualify as an eligible entity for this RFA.

***Q3: I have recently filed patents for advanced engines which, among other things, should be the most thermodynamically efficient engines ever constructed, once prototypes are constructed and proof of principle is established at the level of physical demonstration. Both patents describe compound cycle continuous combustion engines, tightly integrating the Brayton and Rankine cycles. The patents are alike in that both engines are readily configurable as turbogenerators. The patents differ in that one of the engines described is statorless.***

***Do such inventions fall within the eligibility requirement of the above referenced solicitation?***

**A3:** No. Per the RFA's Threshold Eligibility Criteria, you "must address in the narrative proposal one or more of the project categories listed in Part 2 of Section I, Scope of Work of this announcement". Proposals must include all the narrative proposal requirements as stated in the RFA.

In addition, be aware that, per the RFA Threshold Eligibility Criteria, you "must address in [your] narrative proposals a plan for establishing a merit-based selection criteria for identifying qualified graduate students to pursue research in these areas." This graduate student research component is a fundamental part of the RFA, and is covered in Part 1 of Section I (Scope of Work) of the announcement: "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..."

Finally, also be aware that, per the CFDA 66.034 (cited in the RFA in part III A, "Eligible Entities"), "this activity will support surveys, studies, research, and/or investigations or demonstrations, performed by concerned, national, non-profit organizations."

***Q4: The term Hydraulic Hybrid Vehicle (HHV) is repeatedly mentioned in the RFA. We understand these words separately, but we have some difficulty visualizing the technology that EPA refers to when the two words are combined. Please clarify the term "Hydraulic Hybrid Vehicle (HHV)"?***

**A4:** Hydraulic hybrid technology uses a hydraulic energy storage and propulsion system in the vehicle. This hydraulic system captures and stores a large fraction of the energy normally wasted in vehicle braking and uses this energy to help propel the vehicle during the next vehicle acceleration. The hydraulic system also enables the engine to operate more efficiently when it is needed.

Hydraulic hybrids draw from two sources of power to operate the vehicle - the diesel or gasoline engine and the hydraulic components. In other words, a typical diesel-powered or gasoline powered vehicle can be fitted with hydraulic components as a secondary energy storage system. The primary hydraulic components are two hydraulic

accumulator vessels (a high-pressure accumulator capable of storing hydraulic fluid compressing inert nitrogen gas and a low-pressure accumulator) and one or more hydraulic pump/motor units.

**Benefits of Hydraulic Technology:** Hydraulic drivetrains are particularly attractive for vehicle applications that entail a significant amount of stop-and-go driving, such as urban delivery trucks or school buses. A major benefit of a hydraulic hybrid vehicle is the ability to capture and use a large percentage of the energy normally lost in vehicle braking. Hydraulic hybrids can quickly and efficiently store and release great amounts of energy due to a higher power density. This is a critical factor in maximizing braking energy recovered and increasing the fuel economy benefit. While the primary benefit of hydraulics is higher fuel economy, hydraulics also increase vehicle acceleration performance. Hydraulic hybrid technology cost-effectively allows the engine speed or torque to be independent of vehicle speed resulting in cleaner and more efficient engine operation.

**Q5:** *My question relates to the scope of the technologies acceptable for this program. On page two (2) of the RFA in the Project Details section, paragraph 1, states:*

*The partnership(s) will support outstanding graduate students performing studies and research in the fields of: (1) advanced/cost effective HHV technologies, (2) advanced lean, 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.*

This appears to imply that items 1 – 3 represent three alternative fields and therefore they are not three mandatory requirements. Our project partner has a technology that meets the goals of items 2 and 3 above, and which has the potential to make green technology widely available at moderate cost. I am seeking guidance as to whether or not the program will accept proposals that do not directly involve hydraulic energy storage.

**A5:** We will accept proposals that do not directly involve hydraulic energy storage.

However, the context of this RFA is a collaboration with EPA to further optimize Hydraulic Hybrid Vehicle (HHV) technology. With that being the case, note that the first Evaluation Criterion (Section V Part A) states in part that an evaluation factor will be "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 ." Thus, although investigations directly involving hydraulic energy storage are not required, you should explain how your proposed investigations would further optimize HHV technology.

Also, be aware that one of the Threshold Eligibility Criteria (in Section III Part C) states that "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."

***Q6: Are exceptional undergraduate students eligible for the NVFEL on-site research activity described in the grant?***

**A6.** No, undergraduate students are not eligible. As stated in the RFA, only a selection criteria for exceptional graduate students will be accepted. In section III, Threshold Eligibility Criteria, the application is required to address a narrative proposal for establishing a “merit-based selection criteria” for identifying qualified “**graduate**” students to pursue research in these areas. The graduate student research component is a fundamental part of the RFA, and is covered in Part 1 of Section I (Scope of Work) of the announcement: "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..."

***Q7: The grant describes “extended time periods” for the on-site research activity; can you help us to understand what time periods will be anticipated?***

**A7.** As stated in section III of the RFA, 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. That being said, this project will take the form of a cooperative agreement between EPA and the recipient where close collaboration using state of the art experimental techniques in advanced engine development technology including HHV technology, etc is an essential component of the grant in order to allow recipients access to the tools, technology and expertise at NVFEL. Frequency of visit and access to the NVFEL is in the applicant’s discretion.

Also be aware that per the RFA Threshold Eligibility Criteria, your application will be evaluated to the extent to which your physical location will affect your ability to successfully achieve the objectives of this announcement, specifically spending extended periods of time at NVFEL.

In addition, a detailed budget and estimated funding amounts for each project component/task is required in the narrative proposal. 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.

***Q8: Should the grant proposals include funding for the extended time period research activities at NVFEL, or will this be a separate allotment granted by the EPA?***

**A8.** Under Section II, Award Information of the RFA, 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. That being said, all budget proposals should include estimated funding amounts for each project component/task is required in the narrative proposal. 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.

***Q9: For the biographical information requested, should this include all members of the R&D team, including primary investigator, industry partners and student team members?***

**A9.** Include a description of the roles of the applicant and partners, if any as well as concise biographical information on key personnel identified.