NOTICE

Modifications to this Funding Opportunity Announcement (FOA) may have been made since this version was posted. Applicants are strongly advised to consult the FOA version posted on www.FedConnect.com, the official application website, for the latest changes regarding the application materials, dates, and other requirements.

The FedConnect system can be accessed through the following steps:

1. Go to http://www.FedConnect.net/
2. Click on "Search Public Opportunities"
3. Select "Reference Number" in the Search Criteria drop down box and then enter the Reference Number of the funding opportunity you are interested in (DE-FOA-XXXXXXX), followed by clicking the "Search" button
4. Click on the Title hyperlink after search results are displayed
5. On the right side of the screen, click on "BODY" under the "Solicitation" or "Amendment" folder; if multiple amendments exist, click on the most recent award amendment for the latest changes.

If you are new to the Federal grant application process, it can take 21 days or more to complete all of the registration processes needed to submit questions or application. These activities include acquiring a DUNS number, completing a Central Contract Registration (CCR), and FedConnect.com registration. Hence, if you are considering applying for this or another Funding Opportunity, we recommend beginning the registration process as soon as possible.

For further assistance throughout the application process, contact the following numbers:

- **General inquiries:** 1-888-DOE-RCVY (1-888-363-7289), https://recoveryclearinghouse.energy.gov/
- **Central Contract Registration (CCR) system**: 1-888-227-2423, http://www.ccr.gov/Help.aspx
- **FedConnect**: 1-800-899-6665, support@fedconnect.net
- **Specifics on FOA**: see "Questions" portion of the FOA

10/2008

FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U. S. Department of Energy

National Energy Technology Laboratory

Recovery Act - Systems Level Technology Development, Integration,and Demonstration for Efficient Class 8 Trucks (SuperTruck) and Advanced Technology Powertrains For Light-Duty Vehicles (ATP-LD)

Funding Opportunity Number: DE-FOA-0000079

Announcement Type: Initial

CFDA Number:
81.087 Renewable Energy Research and Development

Issue Date:	**June 9, 2009**
Application Due Date:	**September 9, 2009, no later than 3:00 PM Eastern time**

NOTE: REGISTRATION/SUBMISSION REQUIREMENTS

Registration Requirements

There are several one-time actions you must complete in order to submit an application in response to this Announcement (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contractor Registration (CCR), and register with FedConnect). Applicants who are not registered with CCR and FedConnect, should allow at least 10 days to complete these requirements. It is suggested that the process be started as soon as possible.

Applicants must obtain a DUNS number. DUNS website: http://www.dnb.com/US/duns_update/

Applicants must register with the CCR. CCR website: http://www.ccr.gov/

Applicants must register with FedConnect to submit their application. FedConnect website: www.fedconnect.net

Questions

Questions relating to the **system requirements or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or **support@grants.gov**.

Questions regarding the Funding Opportunity Announcement (FOA):
Questions regarding the **content** of the announcement must be submitted through the FedConnect portal once the FINAL FOA is issued. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at **http://www.compusearch.com/products/fedconnect/fedconnect.asp**. DOE will try to respond to questions submitted regarding the FOA within 3 business days, unless a similar question and answer have already been posted on the website.

Questions pertaining to the **submission** of applications through FedConnect should be directed by e-mail to support@FedConnect.net or by phone to FedConnect Support at 800-899-6665.

Application Preparation and Submission

Applicants must download the application package, application forms and instructions, from Grants.gov at: http://www.grants.gov/ (Additional instructions are provided in Section IV A of this FOA.)
Applicants must submit their application through the FedConnect portal.

FedConnect website: www.fedconnect.net (Additional instructions are provided in Section IV H of this FOA.)

Section I - FUNDING OPPORTUNITY DESCRIPTION

American Recovery and Reinvestment Act of 2009 (ARRA 2009)

Projects under this FOA will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act). The Recovery Act's purposes are to stimulate the economy and to create and retain jobs. The Act gives preference to activities that can be started and completed expeditiously, including a goal of using at least 50 percent of the funds made available by it for activities that can be initiated not later than June 17, 2009. Accordingly, special consideration will be given to projects that promote and enhance the objectives of the Act, especially job creation, preservation and economic recovery, in an expeditious manner.

Be advised that special terms and conditions may apply to projects funded by the Act relating to:
- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Prohibition on use of funds for gambling establishments, aquariums, zoos, golf courses or swimming pools;
- Ensuring that iron, steel and manufactured goods are produced in the United States;
- Ensuring wage rates are comparable to those prevailing on projects of a similar character;
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and Registration.

These special terms and conditions will be based on provisions included in Titles XV and XVI of the Act. The exact terms and conditions will be provided as soon as available.

The Office of Management and Budget (OMB) has issued Initial Implementing Guidance for the Recovery Act. See M-09-10, Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009. OMB will be issuing additional guidance concerning the Act in the near future. Applicants should consult the DOE website, www.energy.gov, the OMB website http://www.whitehouse.gov/omb/, and the Recovery website, www.recovery.gov regularly to keep abreast of guidance and information as it evolves.

Recipients of funding appropriated by the Act shall comply with requirements of applicable Federal, State, and local laws, regulations, DOE policy and guidance, and instructions in this FOA, unless relief has been granted by DOE. Recipients shall flow down the requirements of applicable Federal, State and local laws, regulations, DOE policy and guidance, and instructions in this FOA to subrecipients at any tier to the extent necessary to ensure the recipient's compliance with the requirements.

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related OMB Guidance. Applicants for projects funded by sources other than the Recovery Act should plan to keep separate records for Recovery Act funds and ensure those records comply with the requirements of the Act. Funding provided through the Recovery Act that is supplemental to an existing grant is one-time funding.

Applicants should begin planning activities for their first tier subawardees, including obtaining a DUNS number (or updating the existing DUNS record) and registering with the Central Contractor Registration (CCR). The extent to which subawardees will be required to register in CCR will be determined by OMB at a later date.

Description

Objective

The goal of Area of Interest 1 is to develop and demonstrate a 50% improvement in overall freight efficiency on a heavy-duty Class 8 tractor-trailer measured in ton-miles per gallon. This improvement will be achieved through the application of advanced vehicle system technologies and advanced engine technologies. At least 20% of the improvement will be through the development of an engine capable of achieving 50% Brake Thermal Efficiency (BTE). Over the 3 to 5 year period of this activity, the selected participants will develop, test, and ultimately demonstrate these advanced technologies on a full-scale vehicle. A pathway to compliance with prevailing federal safety and environmental regulations must be shown. Candidate vehicle system technologies may include reductions in aerodynamic drag, vehicle mass, and rolling resistance, and other technologies as appropriate. Electrical or mechanical drivetrain hybridization, including energy storage/regeneration and main engine idle and other ancillary load reductions, may also be considered.

In an effort to bring the best possible resources to bear on this transformational vehicle development, teams are expected to include but are not limited to a vehicle OEM, engine manufacturers and critical suppliers. The project will be organized in phases with well-defined stage gates at the end of each phase. An in-depth review will be held at the end of each phase and a determination made concerning continuing the project into the next stage. Changes to DOE program priorities as well as the current state of technology and the marketplace will be factors considered when making decisions to proceed.

The goal of Area of Interest 2 is to accelerate the development of cost-competitive engine and powertrain systems for light-duty vehicles capable of attaining breakthrough thermal efficiencies while meeting future emissions standards. Development of the engine and powertrain system can include improvements to in-cylinder combustion, engine mechanics, waste heat recovery, friction reduction, emission control, fuels, materials, electrification, and reduced ancillary load requirements. The engine system can be designed to accommodate a hybrid system, CVT or other advanced transmission. The project will be organized in phases with well-defined phase gates at the end of each phase.

Over the three-to-five year period of this activity, the selected participants will develop, test and eventually demonstrate these advanced technologies and the associated efficiency gains on an engine dynamometer and full-scale vehicle. Emissions will be measured to show compliance. Technologies that are compatible with or can support future fuels and are adaptable to bio-fuels with relatively minor modifications will be taken into consideration during the comprehensive merit evaluation process. Achievement of the stated fuel economy goals may require improvements to the entire powertrain system although engine system efficiency improvements will play a significant role in this effort. In order to bring the best possible resources to bear on this problem, appropriate teaming arrangements among suppliers, national labs, universities, and vehicle OEMs are encouraged. Proposed activity coincides with the multi-year program plan and Fiscal Year 2010 to 2014 budgets.

AREAS OF INTEREST

NOTE:

Applicants must identify the Area of Interest they are applying to in the Project Narrative and identify the Area of Interest in the file name. For example if an applicant were applying to Area of Interest 1 (Project01.pdf); and if applying to Area of Interest 2 (Project02.pdf). Each application must have its own unique title.

Applicants must submit their application under the Program Area of Interest that they feel best fits the majority of the effort to be performed and identify the Area of Interest and intent upfront. If DOE believes an application fits more appropriately in a Program Area of Interest other than the one to which it was submitted, DOE will either consider the application under the more

appropriate Area of Interest or will direct the Applicant to resubmit to the appropriate Area of Interest. **Do not submit identical applications under more than one Area of Interest.**

1. Systems Level Technology Development, Integration, and Demonstration for Efficient Class 8 Trucks (SuperTruck)

2. Advanced Technology Powertrains for Light-Duty Vehicles (ATP-LD)

AREA OF INTEREST 1: SYSTEMS LEVEL TECHNOLOGY DEVELOPMENT, INTEGRATION AND DEMONSTRATION FOR EFFICIENT CLASS 8 TRUCKS

The overall goal of this effort is to develop and demonstrate a 50% total increase in vehicle freight efficiency measured in ton-miles per gallon. This overall goal will be achieved through efficiency improvement in advanced vehicle systems technologies and advanced engine technologies. At least 20% of this improvement will be through the development of a heavy-duty diesel engine capable of achieving 50% Brake Thermal Efficiency (BTE) on a dynamometer under a load representative of a level road at 65 mph.

The vehicle freight efficiency improvement must be achieved while meeting prevailing emission standards and Class 8 tractor-trailers vehicle safety and regulatory requirements. The systems developed shall be validated as cost effective via a business case analysis and will be reviewed for commercialization potential in later project phases as part of the phase gate review process.

Achieving significant increases in vehicle efficiency for Class 8 trucks will require an integrated systems approach to ensure that the various components of the vehicle work synergistically to provide maximum benefit. For these reasons, DOE is seeking proposals from integrated teams that include an engine manufacturer, a truck OEM and a trailer manufacturer, suppliers, national labs, universities, fleet operators and other stakeholders. These integrated teams are encouraged to examine efficiency opportunities throughout the tractor and trailer combination unit as well as the engine.

As a separate and parallel effort, proposers shall identify, through modeling and analysis, key pathways to achieving our long-term goal of developing a 55% efficient (brake thermal efficiency) heavy-duty diesel engine. Critical components and/or systems needing specific development to achieve this goal should also be identified. This engine must be capable of meeting 2010 emission standards, and be commercially viable.

The following table identifies specific research, development, and demonstration activities that at a minimum should be addressed in each proposal.

Heavy Duty Demonstration Requirements

Demonstration Type	Efficiency	Emissions	Conditions	DOE Cooperatively Funded R&D
Diesel Engine	≥ 50% Brake Thermal Efficiency	≤ 2010 or prevailingEmission Standards	**Type:** Dynomometer **Profile:** Class 8 Vehicle under Load Representative of a Level Road, 65 mph	Engine and Ancillary Systems Waste Heat Recovery Materials Electrification Fuels from non-food Feedstocks(1)
Full Scale Vehicle	≥ 50% Vehicle Freight Efficiency Improvement (ton-miles/gallon)(2) (≥20% due to ≥ 50% Brake Thermal Efficiency Deisel Engine)		**Type:** On Road **Profile:** Class 8 Vehicle weighing 65,000 pounds evaluated over a test cycle proposed by the the industry team.(3) Other Vehicle Systems(4)	Engine and Ancillary Systems Waste Heat Recovery Fuels from non-food Feedstocks(1) Aerodynamic Drag Reduction Rolling Resistance Reduction Powertrain Hybridization Weight Reduction

Note:

(1) Consideration will be given to funding R&D activities related to biomass-derived, renewable diesel fuels in connection with these awards. Including work on such fuels, though desirable, is not required and any fuel work will be funded above and beyond independent tasks. Fuel-related work should bear a natural relationship to other proposed tasks.

(2) Improvement is based on comparison to similarly configured “Best-In-Class” 2009 commercially available Class 8 Vehicle maintaining comparable vehicle performance.

(3) A test cycle shall be proposed that is representative of a typical long-haul Class 8 truck consisting of minimum of 75 percent of the distance traveled under highway conditions, with vehicle weight of 65,000 lbs.

(4) Definitions in Appendix (A). Other systems submitted by applicants are also acceptable.

Applications shall identify jobs directly created or retained because of this project (e.g. engineers, test operators, etc.) as well as the long-term jobs created as a result of the project. Specifically, the applicants shall provide information detailing:

1) the number of new jobs directly created (or retained) within the first year of the project;

2) the number of new jobs indirectly created (or retained) within the first year of the project for major suppliers to the project; and

3) the number of long term jobs created by the project (lasting more than five years from the

end of the project).

Consideration and priority will be given to projects which create the greatest number of jobs within the first three years of the project and projects that create long term sustainable jobs. Speculation on induced jobs that may occur as a result of workers employed as a result of this project shall not be included (e.g. jobs associated with grocery stores, retail stores, transportation, etc). Applicants are advised that awards will include a requirement that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the Secretary of Labor.

AREA OF INTEREST 2: ADVANCED TECHNOLOGY POWERTRAINS FOR LIGHT-DUTY VEHICLES

The goal of this effort is to accelerate the development of cost-competitive engine and powertrain systems for light-duty vehicles capable of attaining at least a 25% fuel economy improvement for gasoline fueled vehicles and at least 40% fuel economy improvement for diesel fueled vehicles while meeting future emissions standards.

The following table identifies specific research, development, and demonstration activities that, at a minimum, should be addressed in each proposal.

Light Duty Demonstration Requirements

Demonstration Type	Efficiency	Emissions	Conditions	DOE Cooperatively Funded R&D
Modeling and/or Analysis	≥ 25% Fuel Economy Improvement (Gasoline Engine) (1) ≥ 40% Fuel Economy Improvement (Diesel Engine) (1)	≤ Tier II Bin 2 levels	**Type:** On Road representative **Profile:** City FTP and Highway fuel economy cycles (unadjusted, weighted 55% and 45% to give a "combined" fuel economy number) Test cycles and measurement procedures per CFR 40, Part 600.	Engine and Ancillary Systems (2) (Limitations (3))
Full Scale Vehicle	≥ 25% Fuel Economy Improvement (Gasoline Engine) (1) ≥ 40% Fuel Economy Improvement (Diesel Engine) (1)	≤ Tier II Bin 2 levels	**Type:** On Road **Profile:** City FTP and Highway fuel economy cycles (unadjusted, weighted 55% and 45% to give a "combined" fuel economy number) Test cycles and measurement procedures per CFR 40, Part 600. US06 cycle	Engine and Ancillary Systems (2) (Limitations (3))

Note: (1) Improvement is based on comparison to a baseline state-of-the-art port fuel-injected gasoline vehicle maintaining comparable vehicle performance
(2) Includes improvements to in-cylinder combustion, waste heat recovery, friction reduction, emission control, fuels, materials, electrification and reducing ancillary load requirements
(3) The engine system can be designed to accommodate a hybrid system, CVT or other

advanced transmission, however, the development of these technologies ***will not*** be cooperatively funded by the DOE. For an engine used in a hybrid vehicle application, the stated fuel economy improvements shall result from improvements only to the engine system efficiency when compared to the base-line hybrid vehicle. Funding for the hybrid system ***will not*** be considered for this area of interest.

Applications shall identify jobs directly created or retained as a result of this project (e.g. engineers, test operators, etc.) as well as the long term jobs created as a result of the project. Specifically, the applicants shall provide information detailing:

4) the number of new jobs directly created (or retained) within the first year of the project;

5) the number of new jobs indirectly created (or retained) within the first year of the project for major suppliers to the project; and

6) the number of long term jobs created by the project (lasting more than five years from the end of the project).

Consideration and priority will be given to projects which create the greatest number of jobs within the first three years of the project and projects that create long term sustainable jobs. Speculation on induced jobs that may occur as a result of workers employed as a result of this project shall not be included (e.g. jobs associated with grocery stores, retail stores, transportation, etc).

Applicants are advised that awards will include a requirement that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the Secretary of Labor.

Section II - AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

Cooperative Agreements

- DOE anticipates awarding cooperative agreements under this program announcement (See Section VI.B.2 Statement of Substantial Involvement).

B. ESTIMATED FUNDING

Amount New Awards

- Area of Interest 1 (SuperTruck): Approximately $90,000,000-$160,000,000 of DOE funding is expected to be available for new awards under Area of Interest 1.

- Area of Interest 2 (ATP-LD): Approximately $25,000,000 to $80,000,000 of DOE funding is expected to be available for new awards under Area of Interest 2.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling (i.e., the maximum amount for an individual award made under this announcement):
  Area of Interest 1 (SuperTruck): $80,000,000 (DOE share $40,000,000, Recipient share $40,000,000)
  Area of Interest 2 (ATP-LD): $30,000,000 (DOE share $15,000,000, Recipient Share $15,000,000)

- Floor (i.e., the minimum amount for an individual award made under this announcement):
  Area of Interest 1 (SuperTruck): $40,000,000 (DOE share $20,000,000, Recipient Share $20,000,000)
  Area of Interest 2 (ATP-LD): $4,000,000 (DOE share $2,000,000, Recipient Share $2,000,000)

D. EXPECTED NUMBER OF AWARDS

Number of Awards Depending on Size

- DOE anticipates making 3-5 awards under Area of Interest 1- SuperTruck within this announcement depending on the size of the award.

- DOE anticipates making 3-6 awards under Area of Interest 2- Light Duty within this announcement depending on the size of the award.

E. ANTICIPATED AWARD SIZE

Maximum Award Size Range

- Area of Interest 1 (SuperTruck): While the maximum award size (i.e. the ceiling) is $80,000,000, DOE anticipates that awards will be in the $40,000,000-$80,000,000 range for the total project period.
- Area of Interest 2 (ATP-LD): While the maximum award size (i.e. the ceiling) is $30,000,000, DOE anticipates that awards will be in the $5,000,000-$15,000,000 range for the total project period.

F. PERIOD OF PERFORMANCE

Number of Years

- For Areas of Interest 1 and 2, DOE anticipates making multiple awards with project periods up to five years with multiple budget periods.

G. TYPE OF APPLICATION

New Applications Only

- DOE will accept new applications under this announcement.

Section III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

All Entities excluding Federal Agencies, FFRDC and Non Profit

- All types of entities are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING

Projects selected under this announcement may be funded with either ARRA or annually appropriated funds. The type of funding to be used will depend on the ranking of the project within the merit review process (See the "Review and Selection Process" section of this document) and any application of program policy factors. Applications selected using program policy factors may take precedence over other selections.

- Recipient awards selected using ARRA funds have a recipient cost share required to be 50% or higher of the total allowable costs of the project (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable costs of the projects) and must come from non-Federal sources unless otherwise allowed by law. However, applications with proposed cost share as low as 25% recipient share shall be considered, using the Secretary's statutory authority to reduce cost-share requirements. Applicants proposing a cost-share below 50% (recipient share) shall provide a justification for their request. Please note that cost share is an evaluated criterion in accordance with Part V of the FOA.
- Recipient awards selected using annually appropriated program funding will be required to provide cost share of at least 50% of the total allowable costs of the project (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable costs of the projects) and must come from non-Federal sources unless otherwise allowed by law.

C. OTHER ELIGIBILITY REQUIREMENTS

FFRDC

A. REQUIREMENTS

- **Federally Funded Research and Development Center (FFRDC) Contractors**. FFRDC contractors are not eligible for an award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

  Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

  FFRDC Contractor Effort:

  - The FFRDC contractor effort, in aggregate, shall not exceed 20% of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

Section IV - APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to http://www.grants.gov, select "Apply for Grants," and then select "Download Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent.

Letters of Intent Not Required

- Letters of Intent are not required.

2. Pre-application

Pre-applications Not Required

- Pre-applications are not required.

C. CONTENT AND FORM OF APPLICATION

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

1. **SF 424 (R&R)** Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the "Help Mode" (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms Page at http://management.energy.gov/business_doe/business_forms.htm under Certification and Assurances.

2. **RESEARCH AND RELATED Project/Performance Site Location(s).** Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site(s).

3. **RESEARCH AND RELATED Other Project Information**
   Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

   Project Summary/Abstract (Field 6 on the Form)

   The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may

make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click "Add Attachment."

Project Narrative (Field 7 on the Form)

The project narrative must not exceed **30** pages, **for applications under Areas of Interest 1 and 2**, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right). **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click "Add Attachment." **Applicants must identify the Area of Interest they are applying to in the project narrative and identify the Area of Interest number in the file name. For example if an applicant were applying to Area of Interest 1 "Project01.pdf"; if applying to Area of Interest 2 "Project02.pdf".**

The project narrative must include:

- Project Objectives: This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

- Merit Review Criterion Discussion: The section should be formatted to address each of the merit review criterion and sub-criterion listed in Part V. Section A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.

- Relevance and Outcomes/Impacts: This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.

- Project Timetable: This section should outline as a function of time, year by year, 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: For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

- Multiple Principal Investigators: The applicant, whether a single organization or team/partnership/consortium, must indicate if the project

will include multiple PIs. This decision is solely the responsibility of the applicant.

If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include:

- process for making decisions on scientific/technical direction;
- publications;
- intellectual property issues;
- communication plans;
- procedures for resolving conflicts; and
- PIs' roles and administrative, technical, and scientific responsibilities for the project.

- Facilities And Other Resources: Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project such as machine and electronics shops.

- Equipment: List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.

- Bibliography And References, If Applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

- Statement Of Project Objectives (SOPO):
  The Department of Energy's, National Energy Technology Laboratory uses a specific format for Statement of Project Objectives in its awards. In announcements such as this one, where the Government does not provide a Statement of Project Objectives, the Applicant is to provide one, which the DOE will then use to generate the Statement of Project Objectives to be included in the award.

  The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part at any time. It is therefore required that it shall not contain proprietary or confidential business information.
  The Statement of Project Objectives is generally less than 10 pages in total for the proposed work and is not included in the 30 page limitation to

the project narrative. Applicants shall prepare the Statement of Project Objectives in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert the title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Part.

PHASE I

Task 1.0 – Project Management and Planning

(Description includes work elements required to revise and maintain the Project Management Plan and to manage and report on activities in accordance with the plan)

Subtask 1.1

(Description)

Task 2.0 - (Title)

PHASE II (Optional)

Task 3.0 - (Title)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

[Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the Project Officer at the Project Officer’s facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort approximately twice a year.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV.

- Project Performance Site:
  Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, please identify those sites.
- Third Parties Contributing to Cost Sharing Appendix: At the time you submit your application, you must have a letter from each third party (i.e., a party other than the organization submitting the application). The letter must state that the third party is committed to providing a specific minimum dollar amount of cost sharing. By submitting your application, you are providing assurance that you have signed letters of commitment. In an appendix to your Project Narrative, you must identify the following information for each third party contributing to cost sharing: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing – cash, services, or property. This appendix will not count in the project narrative page limitation. Successful applicants must provide the signed letters of commitments within the number of days specified in Part IV. Section D, Submissions from Successful Applicants.

Other Attachments (Field 11 on the form):

If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, attach a file in field 11.

Also, attach the following files:

Project Management Plan

This plan should be formatted to include the following sections with each section to include the information as described below:

A. Executive Summary: Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative (Field 7) and should be simply copied to this document for completeness, so that the Project Management Plan is a stand-alone document.

B. Risk Management: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.

C. Milestone Log: Provide milestones for each budget period (or phase) of the project. Each milestone should include a title and planned completion date, Milestones should be quantitative and show progress toward budget period and/or project goals.

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report as prescribed under Attachment 4, Reporting Requirements Checklist. The Milestone Status will present actual performance in comparison with Milestone Log, and include:

(1) the **actual** status and progress of the project,
(2) specific progress made toward achieving the project's milestones, and,

(3) any proposed changes in the project's schedule required to complete milestones.]

D. Funding and Costing Profile: Provide a table (the Project Funding Profile) that shows, by budget period, the amount of government funding going to each project team member. Also, provide a table (the Project Costing Profile) that projects, by month, the expenditure of government funds for the first budget period, at a minimum.

E. Project Timeline: Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C).

F. Success Criteria at Decision Points: Provide success criteria for each decision point in the project, including go/no-go decision points and the conclusions of budget periods and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

[Note: As the first task in the Statement of Project Objectives, successful applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report schedule and budget variances.]

Save this plan in a single file named "pmp.pdf" and click on "Add Attachments" in Field 11 to attach.

Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor, if applicable. If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at http://management.energy.gov/business_doe/business_forms.htm. Use the FFRDC name as the file name (up to 10 letters) and attach to the R&R Other Project Information form in Field 11 – Add Attachments.

Environmental Questionnaire

All projects receiving financial assistance from DOE must be reviewed under the National Environmental Policy Act (NEPA). Based on its review of the activities in the areas of interest that are eligible for funding under this announcement, DOE has determined that many of these activities may be categorically excluded from further analysis under NEPA. However, some proposed activities may require the preparation of an environmental assessment or an environmental impact statement.

You must complete the environmental questionnaire (NETL Form 451.1-1/3) for each location where work will be performed (do not fill out NETL Form 451.1-1/1, which is attached at the end of Form 451.1-1/3; DOE is responsible for completing Form 451.1-1/1). Fill-able versions of the Environmental Questionnaire are available at http://www.netl.doe.gov/business/forms.html#POST_SEL_AP. Save the questionnaire(s) in a single file named "Env.pdf" and click on "Add Attachments" in Field 12 to attach.

4. RESEARCH AND RELATED Senior/Key Person

Complete this form before the Budget form to populate data on the Budget form. Beginning with the PD/PI, provide a profile for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. Subawardees and consultants must be included if they meet this definition. For each senior/key person provide:

Biographical Sketch.

Complete a biographical sketch for each senior/key person and attach to the "Attach Biographical Sketch" field in each profile. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the "Attach Current and Pending Support" field in each profile.

5. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the

categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV. Section G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. If cost sharing is required, provide an explanation of the source, nature, amount, and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

6. **R&R SUBAWARD (Total Fed + Non-Fed) FORM**
Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name as the file name.

7. **Disclosure of Lobbying Activities (SF-LLL)**
If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

8. **Cost Share Reduction Justification**
A cost share reduction justification must be provided when proposing less than the required 50% or higher recipient cost share. Justifications must be signed by the person authorized to commit the expenditure of funds for the entity and be provided in a PDF format. Save this letter in a single file named "Just.pdf," and click on "Add Optional Other Attachment" to attach.

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 6

Project Narrative, including required appendices	PDF	Field 7
Budget for DOE/NNSA FFRDC, if applicable	PDF	Field 11
Project Management Plan	PDF	Field 11
Commitment Letters from Third Parties	PDF	Field 11
Environmental Questionnaire	PDF	Field 11
SF 424C Excel - Budget Information for Construction Programs File	PDF	Field 11
RESEARCH & RELATED SENIOR/KEY PERSON	Form	N/A
Biographical Sketch	PDF	Attach to appropriate block
Current and Pending Support	PDF	Attach to appropriate block
RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET (Total Fed + Non-Fed) ATTACHMENT(S) FORM, if applicable	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE/NNSA reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

Pre-applications Are Not Required

- Pre-applications are not required.

2. Application Due Date

Applications Due Date 3:00 PM

- Applications should be received by September 9, 2009, not later than 3:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

- This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

FedConnect

APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT TO BE CONSIDERED FOR AWARD. Submit electronic applications through the FedConnect portal at www.fedconnect.net. Information regarding how to submit applications via Fed Connect can be found at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

Further, it is the responsibility of the applicant, prior to the offer due date and time, to verify successful transmission.

2. Registration Process

One Time Registration Process

There are several one-time actions you must complete in order to submit an application in response to this Announcement (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), and register with FedConnect). Applicants, who are not registered with CCR and Fedconnect, should allow at least 10 days to complete these requirements. It is suggested that the process be started as soon as possible.

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria

All applications that pass the initial review process will receive a detailed and consistent technical evaluation utilization the evaluation criteria described below.

The following criteria are proposed to be used to evaluate Applications:

Area of Interest 1: Systems Level Technology Development, Integration, and Demonstration for Efficient Class 8 Trucks (SuperTruck)

Criteria 1: Technical Merit of Technology (40%)

a) Responsiveness and relevance of the application to the programmatic research goals and requirements identified in this announcement for this area of interest;
b) Knowledge and understanding of past and current work in the technology area proposed and how the proposed effort builds on or expands from these prior efforts;
c) Degree and nature of the identified risk in developing the proposed technology, including definition of potential technology deficiencies and proposed solutions;
d) Innovativeness of the proposed technology;
e) Scientific soundness and technical feasibility of the proposed technology (Is it based on sound scientific principles and on an understanding of the current state-of-the-art?);
f) Adequacy of discussion of the degree of the current state of development of the proposed technology, including any modeling or laboratory data and results;
g) Adequacy of the rationale for the proposed phase tasks and products
h) Anticipated outcomes and benefits of the proposed technology (e.g., progress toward greater than 50% vehicle freight efficiency (ton-miles/gallon) improvement in a heavy-duty vehicle)
i) Anticipated outcomes and benefits of the proposed technology (e.g., progress toward greater than 50% brake thermal efficiency improvement in a heavy-duty vehicle)

Criteria 2: Research Plan (20%)

a) Adequacy and thoroughness of the approach to the proposed work to successfully meet the project objectives;
b) Adequacy of the planned testing to address key operational and performance aspects of the technology, including the level of detail for proposed test matrices, data acquisition, and sampling and analysis protocols;
c) Adequacy and appropriateness of the schedule including the duration and sequencing of tasks and the scheduling of project milestones and decision points;
d) Clarity, completeness, and adequacy of the SOPO;
e) Adequacy of plans for continued development, integration, and/or commercialization of the proposed technology beyond the proposed effort.

Criteria 3: Team Capabilities and Facilities (20%)

a) Qualifications and capabilities of key personnel;

b) Prior success in conducting research at the proposed scales of development;
c) Extent of involvement of the prime applicant in the execution of the proposed work;
d) Ability to assemble a team necessary for the successful development of the technologies as well as vehicle level integration and demonstration;
e) Availability and adequacy of equipment, facilities, and other support necessary for the successful performance of the proposed work;
f) Appropriateness of the planned assignment of responsibilities and level of effort among individuals and team members; and
g) Adequacy and appropriateness of the proposed plan for coordinating, directing, and performing the proposed work.

Criteria 4: Energy, Environmental, and Economic Benefits (20%):

a) Potential of the proposed technology to reduce or support the reduction of the domestic transportation sector petroleum consumption;
b) Potential for the proposed technology to reduce or support the reduction of the domestic transportation sector environmental impacts;
c) Potential to provide or support economic benefits to end-use U.S. consumers; and
d) General applicability, timeliness, and economic viability of the proposed technology and potential to improve domestic transportation sector competitiveness.

Area of Interest 2: Advanced Technology Powertrains for Light-Duty Vehicles (ATP-LD)

Criteria 1: Technical Merit of Technology (40%)

a) Responsiveness and relevance of the application to the programmatic research goals and requirements identified in this announcement for this area of interest;
b) Knowledge and understanding of past and current work in the technology area proposed and how the proposed effort builds on or expands from these prior efforts;
c) Degree and nature of the identified risk in developing the proposed technology, including definition of potential technology deficiencies and proposed solutions;
d) Innovativeness of the proposed technology;
e) Scientific soundness and technical feasibility of the proposed technology (Is it based on sound scientific principles and on an understanding of the current state-of-the-art?);
f) Adequacy of discussion of the degree of the current state of development of the proposed technology, including any modeling or laboratory data and results;
g) Adequacy of the rationale for the proposed phase tasks and products
h) Anticipated outcomes and benefits of the proposed technology (e.g., progress toward a 25-40% improvement in fuel economy in a light-duty vehicle)

Criteria 2: Research Plan (20%)

a) Adequacy and thoroughness of the approach to the proposed work to successfully meet the project objectives;
b) Adequacy of the planned testing to address key operational and performance aspects of the technology, including the level of detail for proposed test matrices, data acquisition, and sampling and analysis protocols;
c) Adequacy and appropriateness of the schedule including the duration and sequencing of tasks and the scheduling of project milestones and decision points;
d) Clarity, completeness, and adequacy of the SOPO;
e) Adequacy of plans for continued development, integration, and/or commercialization of the proposed technology beyond the proposed effort.

Criteria 3: Team Capabilities and Facilities (20%)

a) Qualifications and capabilities of key personnel;
b) Prior success in conducting research at the proposed scales of development;
c) Extent of involvement of the prime applicant in the execution of the proposed work;
d) Ability to assemble a team necessary for the successful development of the technologies as well as vehicle level integration and demonstration;
e) Availability and adequacy of equipment, facilities, and other support necessary for the successful performance of the proposed work;
f) Appropriateness of the planned assignment of responsibilities and level of effort among individuals and team members; and
g) Adequacy and appropriateness of the proposed plan for coordinating, directing, and performing the proposed work.

Criteria 4: Energy, Environmental, and Economic Benefits (20%)

a) Potential of the proposed technology to reduce or support the reduction of the domestic transportation sector petroleum consumption;
b) Potential for the proposed technology to reduce or support the reduction of the domestic transportation sector environmental impacts;
c) Potential to provide or support economic benefits to end-use U.S. consumers; and
d) General applicability, timeliness, and economic viability of the proposed technology and potential to improve domestic transportation sector competitiveness.

3. Other Selection Factors

The selection official will consider the following program policy factors in the selection process:

1. Diversity of Technologies - It may be desirable to select for award a group of projects which represents a diversity of technical approaches and methods;
2. Optimization of Federal Funds - It may be desirable to select projects for award of less technical merit than other projects, if such a selection will optimize use of available funds by allowing more projects to be supported while not being detrimental to the overall objectives of the program. This may include, but is not limited to, the percentage of non-federal cost share contributed to the project.
3. Diversity of Organizations - It may be desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of different technical perspectives;

4. It is desirable to select applications which promote and enhance the objectives of the American Recovery and Reinvestment Act of 2009, P.L. 111-5, especially job creation, and/or preservation and economic recovery in an expeditious manner. This would include the selection of projects that preserve and protect the greatest number of United States construction and manufacturing jobs (including jobs at facilities that have recently closed or are planned for closure in the near future).

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is available under Financial Assistance, Regulations and Guidance at

http://www.management.energy.gov/documents/meritrev.pdf.

2. Selection

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

It is the Government's intent to select awards based on technical merit and the application of program policy factors. The highest technically rated projects and projects selected using program policy factors will be funded using ARRA funds. Highly rated projects that remain after selection of ARRA funded projects will be funded using annually appropriated funds. Applicable cost share requirements (as described in the cost share section of this document) and reporting requirements will apply based on the specific appropriation.

3. Discussions and Award

Government Discussions with Applicant

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

Selection and Award Date

DOE anticipates notifying applicants selected for award by December 2009 and making awards by February 15, 2010.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

- DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV. Section G with respect to the allowability of pre-award costs.)

  Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

A Notice of Financial Assistance Award or Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE/NNSA.; (4) DOE assistance regulations at 10 CFR part 600; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110 the Award also includes the Research Terms and Conditions located at http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: http://ecfr.gpoaccess.gov). Grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110 are subject to the Research Terms and Conditions located on the National Science Foundation web site at http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

ARRA 2009 Award Administration Information

Special Provisions relating to work funded under American Recovery and Reinvestment Act of 2009, Pub. L. 111-5 shall apply. Also, the Office of Management and Budget may be promulgating additional provisions or modifying existing provisions. Those additions and modifications will be incorporated into the Special Provisions as they become available.

2. Special Terms and Conditions and National Policy Requirements

Special Terms and Conditions and National Policy Requirements. The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm.
The National Policy Assurances To Be Incorporated As Award Terms are located at DOE http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions. The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

Statement of Substantial Involvement

There will be substantial involvement between the DOE and the Recipient during performance of this Cooperative Agreement. The DOE and Recipient will share responsibility for the management of the Project as further described in this section.

The Recipient is responsible for:

- Performing the activities supported by this award, including providing the required personnel, facilities, equipment, supplies and services;
- Defining approaches and plans, submitting the plans to the DOE Project Officer for review, and incorporating DOE comments;
- Managing and conducting the project activities;
- Providing all deliverables specified in the award on a timely basis;
- Participating in all briefings specified in the award Statement of Project Objectives and attending and reporting project status at program/project review meetings as deemed necessary by the DOE Project Officer;
- Submitting technical reports to the DOE Project Officer and incorporating DOE comments; and;
- Presenting the project results at appropriate technical conferences or meetings as recommended by the DOE Project Officer.

DOE is responsible for:

- Reviewing in a timely manner project plans, including technology transfer plans, and recommending alternate approaches to the work effort if the plans do not address critical programmatic issues;
- Suggesting specified kinds of direction or redirection of the work because of interrelationships with other projects.
- Reviewing in a timely manner, technical reports and other deliverables and providing comments to the Recipient;
- Conducting project and program review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches to work or shifting work emphasis, if needed;
- Review of Continuation Application materials and phase gate criteria to support continuation into subsequent budget periods;
- Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications; and
-Serving as scientific/technical liaison between awardees and other program or industry staff.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. For a sample Checklist, see http://management.energy.gov/documents/DOEF46002PolicyVersion.pdf.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at http://www.compusearch.com/products/fedconnect/fedconnect.asp. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

B. AGENCY CONTACT

Name:	Meghaan D. Hampton
E-mail:	meghaan.hampton@netl.doe.gov
FAX:	304-285-4683

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements. More information is available at http://www.fedconnect.net and http://www.compusearch.com/products/fedconnect/fedconnect.asp.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

"The data contained in pages [*Insert pages*] of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure

agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

Program Covered Under Special Protected Data

Special Protected Data Statutes. This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to five (5) years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data Programs Covered Under Special Protected Data Statutes (10 CFR 600 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver http://www.gc.doe.gov/documents/gc62_advance.pdf of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784 http://www.gc.doe.gov/documents/patwaivclau.pdf.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

Section IX - APPENDICES/REFERENCE MATERIAL

APPENDICES/REFERENCE MATERIAL

Appendix A – Suggested Technology Areas

1. Hybridization

Incorporation of hybrid technology into Class 8 over-the-road vehicles offers the potential for braking energy recovery over some drive cycles. In addition, the availability of high-voltage electric power onboard the tractor can enable the use of electric accessories for reducing vehicle parasitic loads, and the availability of energy storage can enable the use of idling reduction technologies. Also, depending on the configuration of the energy storage and drive motors (electric or hydraulic), some capability for low-speed creep may provide efficiency benefits by allowing for the vehicle to move slowly in a line of traffic without use of the prime mover. Proposing teams are encouraged to consider all hybrid technologies (electric and hydraulic) and their potential benefits over the heavy-duty truck long-haul operation cycles. Some of the technology areas that teams could explore in the hybridization area include:

Low-Cost, Light-Weight, Reliable Power Electronics and Motors. Hybrid systems will require inexpensive, light-weight, and simplified power electronics and motors which can be easily integrated into these systems. In particular, small-volume power electronics with improved durability and reliability are needed to control voltage, frequency, switching timing, and state-of-charge conditions and manage system power outputs from the prime mover, electric motors, and auxiliary power units. Research and development appropriate to this topic include advanced DC-DC converters, DC-AC inverters, advanced switching electronics, electronic modularization concepts, electromagnetic actuators, advanced capacitors and magnetic devices, pancake or axial gap motors, control algorithms, and advanced packaging concepts.

Advanced Energy Conversion and Energy Storage Technologies and Systems. Advanced energy conversion technologies and systems are required for auxiliary power, energy storage, and energy/power management in advanced vehicles. Research and development appropriate to this topic includes advanced and novel concepts in heavy-vehicle-integrated thermoelectric systems and other advanced energy conversion technologies integrated into systems that can supply 5-10 kW or more of auxiliary truck power. Research and development areas of interest also include advanced battery systems, ultra-capacitors, and flywheels to support heavy vehicle hybridization.

2. Advanced Transmission and Powertrain Components and Systems

The transmission systems and other powertrain components are critical to efficiently transferring energy to the vehicle wheels. Continuously variable transmissions (CVTs) hold promising benefits to heavy vehicles and their integration into heavy hybrid applications should be researched. Automated manual transmissions with optimized shift strategies can improve efficiency over conventional manual transmissions by maintaining the engine in its optimal efficiency range over more of a drive cycle. These advanced transmissions will need to communicate closely with the electronic engine controls to adjust shift logic and operation. Research and development appropriate to this topic includes advanced, next-generation transmissions, CVT's, and powertrain components and systems that are effectively integrated with vehicle prime power to accomplish the program's fuel-economy enhancement and emission reduction goals.

3. Advanced Materials and Lightweighting Concepts

Material properties, performance and optimization will have a tremendous impact on all systems throughout a truck and on energy use / management within all such systems. According to data contained in FHA's Development of Truck Payload Equivalent Factor (TPEF) Final Report about 60% of class 6, 7, and 8 trucks operate at the legal load limit of 80,000 pounds. The typical Class 8 semi tractor trailer unit with a GVW of 80,000 pounds has a tare (empty) weight of 34,000

pounds. The tractor typically weighs around 19,000 pounds and the trailer weighs around 15,000 pounds. This allows for a maximum payload of about 46,000 pounds. The energy efficiency of freight systems us usually measured in ton-miles freight delivered per gallon of fuel consumed. Assuming that trucks will continue to operate at the legal load limit a 10% reduction in tractor weight would result in a 4% improvement in freight hauling capacity with no fuel economy penalty. Therefore a 10% reduction in tractor weight would have that same impact as a 4% engine efficiency improvement. Further, increasing the volume of freight hauled per truck by will result in fewer trucks on the road, reducing traffic congestion and road wear.

Research and development appropriate to this topic includes advanced high-temperature materials, high-strength steels, advanced carbon-fiber composites, porous materials, electronic materials, magnesium-based and titanium-based alloys, low-friction materials, nano-technology, ceramics, and other novel advanced materials that lead to enhanced energy use/management, reduced component and system weight and volume, contribute to aerodynamic drag reduction, and enhanced drive train performance in hybrid powertrains and vehicle propulsion systems.

4. Parasitic Loss Management and Reduction

Auxiliary load systems, fuel and lubrication systems, and cooling systems are an integral part of any truck, and contribute to the overall design and energy use/management on any truck configuration. These auxiliary loads include power steering, HVAC, air compressors, and the like, and can be a significant portion of the overall energy losses from a Class 8 truck over a drive cycle. Improved cooling system efficiency improvements can aid with overall packaging of the system within the truck, and can potentially reduce the frontal area of the vehicle through reduced radiator sizes, which can assist with aerodynamic drag reduction. Research and development appropriate to this topic includes advanced heat exchanger technologies, heat pipe/two-phase flow systems, advanced pumps and compressors, and other advanced thermal and fluid management concepts to improve electric powertrain cooling, enhance drivetrain performance, reduce energy usage, improve system energy management, and reduce component and system weight, volume, and aerodynamic drag in hybrid powertrains and vehicle propulsion systems. Research into reductions in heat transfer between the truck cab and the surrounding environment through advanced glazing, improved insulation, and cab redesigns are also appropriate for this area.

5. Aerodynamic Drag Reduction

Although much progress has been made over the past twenty years to improve the aerodynamic performance of tractors, the overall aerodynamic performance of the tractor-trailer system still offers significant opportunity for improvement. Given the contribution of aerodynamics to overall road-load losses for highway operations (as much as 50 percent of the total), this area should be carefully considered by proposing teams for improvements. Research and development appropriate to this topic includes development of aerodynamic devices such as trailer side skirts, tractor-trailer gap enclosure, trailer base flaps, and other technologies to reduce drag of the complete system. Proposers are also encouraged to consider how aerodynamic drag could be reduced significantly through “clean-sheet” truck/trailer designs that still meet customer needs while improving efficiency greatly.

6. Idling Reduction

Idling of Class 8 trucks to meet driver comfort needs and hotel loads for mandated rest periods continues to be an energy use issue for the nation. Because of this continuing need for driver comfort without significant impacts on overall truck energy use, proposers are encouraged to include idling reduction systems as part of their overall solution: these systems could be battery-based, or could use a small piston engine APU or microturbine to provide the necessary power levels for the cab. Research into how these or other approaches can be fully integrated into the truck system and meet a wide variety of state and Federal regulations for idling reduction is appropriate for this area. Small engine efficiency and emissions improvement technology is also appropriate here.

7. Rolling Resistance

Tire rolling resistance is another significant contributor to overall road load energy use for Class 8 tractor-trailers. Advanced tire designs, tire material formulations, and tire configurations can improve rolling resistance and contribute to fuel efficiency. Proposers are encouraged to include low-rolling resistance tire technology as part of their systems approach, and are encouraged to team with appropriate supplier partners for these technologies.

8. Vehicle Systems and Modeling

Proposers are encouraged to consider other technologies beyond the ones mentioned here, if they offer the ability to improve the overall efficiency of the vehicle, as part of their complete systems viewpoint. Proposers are further encouraged to make extensive use of modeling and simulation to make technology choices and determine potential benefits. Some other considerations are noted below.

Advanced computer modeling. Vehicle systems modeling activities have shown that many vehicle energy saving techniques and methodologies can only be identified and implemented through a complete vehicle system modeling and design approach that encompasses all the interrelated, coupled energy use/management effects throughout the vehicle. Research and development appropriate to this topic includes developing advanced computer modeling of powertrain, components and complete hybrid powertrain concepts, and advanced vehicle systems design optimization and evaluation. Where possible, proposers are encouraged to use commercial or non-proprietary modeling tools (like PSAT or GT-Suite) to model their proposed approaches and estimate potential benefits.

Advanced computerized powertrain algorithms. On-board vehicle computer algorithms could be useful for controlling, managing, and maximizing efficient vehicle system energy use. This is intended to account for all energy use and management, including interrelated, coupled effects, throughout the vehicle. Research and development appropriate to this topic include computer technologies and algorithms that combine the effects of aerodynamic drag, rolling resistance, road grade, geographic positioning, weight, weather conditions (e.g., wind speed and direction), system thermal performance, and system electrical performance to assist in controlling vehicle motion and response as it relates to energy management.