

**RESEARCH CALL TO DOE LABORATORIES
FOR SUBMISSION OF PROPOSALS FOR COST SHARED
RESEARCH AND DEVELOPMENT PROJECTS**



**U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy**

**NANOMANUFACTURING FOR ENERGY EFFICIENCY 2008
RESEARCH CALL**

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SECTION 1 – GENERAL INFORMATION

A. Background

Over the past seven years, the U.S. Government has invested \$8.3 billion in nanotechnology and made great strides in gaining fundamental knowledge at the nanometer-scale. Nanotechnology has the potential for major improvements in energy applications. To capture the potential benefits of nanotechnology to a greater extent, applied research needs to be augmented to accelerate the convergence of nanoscience towards nanomanufacturing.

In order to identify the research and development needs for advancing nanomanufacturing, a workshop for energy efficiency was held in Baltimore, MD (June, 2007), attended by stakeholders from various sectors (basic sciences, industrial research, end-users, business leaders, and Federal agencies). The workshop report (available at <http://eenm.govtools.us/>) is used as a major guiding document for the Nanomanufacturing for Energy Efficiency R&D Program.

This Research Call is restricted to DOE National Laboratories as prime awardees. Industry participation in the planned collaborative research and development projects is critical to ensure that the innovative technologies developed under this program, will be further developed and deployed commercially by the industry.

B. Stage Gate Approach for Commercialization

DOE/EERE's (Energy Efficiency and Renewable Energy) Industrial Technologies Program (ITP) uses the Stage Gate process as a tool to manage the progress of a project and guide disciplined decision-making throughout the course of research, development and commercialization. It divides the path from initial concept to final commercial product or technology into following 5 stages:

- Stage 1 – Preliminary Investigation and Analysis
- Stage 2 – Concept Definition
- Stage 3 – Concept Development
- Stage 4 – Technology Development and Field Verification, and
- Stage 5 – Information Dissemination and Commercialization

Additional information about the Stage Gate Process can be found at:
http://www1.eere.energy.gov/industry/financial/stage_gate_project.html

This Research Call is seeking projects which are at Stages 2, 3 or 4 of development. The proposal should indicate the current and target stage (at the conclusion of the Project). The Commercialization Plan to be included in the proposal (as part of the Project Narrative) should support this identification.

A commercialization plan consistent with the Stage Gate Process will be required. A commercialization plan describes the product, the market, and all the business activities required to make new technology available to an end-user. At a minimum, the plan includes:

- a description of the product to be commercialized;
- identification of the end-using market for the product;
- an explanation of how the benefits of the product satisfy the end-user's needs;
- an explanation of why the end-user would choose the new product over alternative options;
- an estimation of the size of the market;

- a forecast of number of product installations each year from the date of commercialization;
- identification of partners and resources to manufacture, distribute, and service the new product; and
- a discussion of steps to address intellectual property, regulatory, technical and other issues that may impact commercialization.

The depth of the information in the commercialization plan increases and the precision of market size estimation improves as a project moves through the R&D process.

C. Technical Areas of Interest

Nanotechnologies pose promise for reduction of energy and carbon intensity in industrial energy use. In addition, nanotechnologies are poised to make revolutionary improvements in a broad range of energy production, storage, and consumption applications. However, production techniques for nanomaterials and nano-enabled products are presently “stuck at the lab scale”, which greatly impedes the development and growth of nanotechnology applications. The primary purpose of this call is to advance the state of nanomanufacturing such that nanotechnology can begin to capitalize the significant energy and carbon benefits. The objective is to drive improvements in the reliability in nanomaterials production and scale up of manufacturing processes for utilizing nanomaterials in a number of energy-related products. This Research Call seeks “quick-win” nanomanufacturing projects with a realistic path to commercialization in 3-5 years.

The proposed R&D effort should clearly address one of the focus areas under any of the following research categories being pursued by DOE/EERE’s Industrial Technologies Program (ITP) to accomplish its mission.

Area of Interest 1: *Concept Definition Studies* [up to \$2,000,000, 8-12 projects, stage 2 research, 1 year duration]

The proposed concept-definition study should focus on a specific, promising nanotechnology that offers the potential for major energy, carbon, and economic benefits. The study will include technical and economic feasibility analysis that would lead to a well-defined nanotechnology concept with preliminary production system design, detailed performance metrics, technical and economic parameters. The study should identify the specific technical barriers and critical R&D paths required for a commercial production or application that address a significant market opportunity. A complete life cycle analysis for the proposed nanotechnology concept from synthesis of nanomaterials to disposal of product including an evaluation of energy use and safety hazards will be required.

Industry cost share is not required for these nanotechnology concept definition studies. The proposed concept definition study should address any one of the following five categories:

- (1) **Catalysts** (e.g. for chemicals, petroleum, pulp & paper, and energy applications);
- (2) **Coatings and thin-films** (e.g. low-friction, -drag, -wear, and corrosion-resistant; dispersion aids; thermal and energy applications);
- (3) **Separations media** (e.g. for chemicals, petroleum, pulp and paper, water purification, carbon management, and energy applications);
- (4) **Nanocomposites** (e.g. light weight or other functional materials for industrial, automotive, and energy applications), and
- (5) **Other nano-developments** that can yield significant energy and carbon benefits.

Area of Interest 2: Nanomanufacturing Process Development [up to \$8,000,000, 6-10 projects, stage 3, or 4 research, up to 3 year duration]

Partnerships with industrial companies and cost share are required. Collaborations with academe and other research laboratories are highly encouraged. Nano-developments of interest are stated in **Area of Interest 1**. Proposals must be demonstrated for at least one of these technical areas and should show how the technology is at least generally applicable to other application areas. The energy and carbon savings include what can be achieved in manufacturing process, product end use, and power production applications.

Preference will be given to proposals that encompass all research needs and can achieve the end goal of scaling up a targeted production process in 3-5 years.

2.1 Enabling Processes for Nanomaterials Production

Nanomaterials manufacturing processes are presently “stuck at the lab scale”. Existing production processes are larger versions of laboratory-type systems developed primarily by research scientists. An applied R&D effort is needed to select the most promising production techniques within production process categories (laser ablation, plasma, flame pyrolysis, etc. for gas-phase production methods; sol-gel, hydrothermal etc. for chemical production methods; mechanical alloying, milling, etc. for solid processing; self assembly, etc.) and use engineering principles to design a series of economic production systems that will generate uniform materials in production-scale quantities (could be as large as tons/day for commodity markets). Modifications or improvements over existing production systems (in current practice) should be considered for economic reasons.

The following R&D needs are considered vital in scaling up nanomaterials production processes. Inclusion of other R&D needs and innovative ideas is also encouraged.

- Nanoscale Materials Processing – Develop engineering approaches for controllable production of nanomaterials: i) scale-up methods for controllable, uniform manufacturing of nanomaterials, with focuses on synthesis, separations, purification, stabilization, and assembly; and ii) robust dispersion and surface modification processes that retain functionality.
- Real-time Characterization Tools – Develop: i) on-line and in-process analytical tools, and ii) robust measurement tools for quality control, for use in nanomaterials production processes. Capabilities needs include monitoring the following: in-situ particle size and shape; in-situ composition or function (including charge; surface energy; functionalization; magnetic, electrical, or optical properties, etc.); surface chemistry at nanoscale, including fractional coverage and thickness of coatings on nano-particles; and quality of particle dispersion in a solid phase.
- Modeling and Simulation – Modeling and simulations tasks sought in this Research Call are more applied and complementary to basic science efforts being pursued by the DOE Office of Science and other Federal agencies. Develop computational tools for: i) focused design of nanomaterials and/or nano-devices with energy and carbon benefits, and/or ii) design and scale-up of nanomaterials production processes.

2.2 Nanomaterials Utilization in Industrial Processes

For integration of nanomaterials into nano-enabled products, there are a set of “generic” processes that are being used today to integrate nanomaterials into products: liquids, films, polymers, patterning, sprays, ceramics, metals, etc. Researchers are using a

variety of processing techniques to accomplish the integration; some of these could be scaled up for industrial productions and others can't. An R&D effort is needed to identify and modify the more promising techniques to handle nanomaterials at 1/10th of the smallest scale in use in industry today, as a goal. They must be modified in such a way that the nanomaterials do not agglomerate and do not lose their unique properties during the process.

The following R&D needs are considered vital in scaling up nano-enabled production processes. Inclusion of other R&D needs and innovative ideas is also encouraged.

- Robust Scalable Processes – Develop standard, high-yield, low-cost, scalable processes for incorporating nanomaterials into end products by modifying existing techniques and equipment (e.g. the process of incorporating nano-coatings onto surfaces of varying shapes).
- Integrating Processes – Develop understanding of nano-interfaces and techniques of retaining the functionality of nanomaterials when incorporating into devices (e.g. a batch process allowing nano-particles to be mounted into a nano- or macro- device in a repeatable, reliable manner suitable for large-scale mass production).

SECTION II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

- DOE anticipates providing DOE funding for selected projects to National Laboratories through Field Work Proposals.

B. ESTIMATED FUNDING

- Approximately \$ 10 million is expected to be available for new awards under this Announcement.
- Approximately \$ 3.8 million is expected to be available for new awards in FY 2008.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling (i.e., the maximum amount for an individual award made under this Announcement): \$ 2,000,000
- Floor (i.e., the minimum amount for an individual award made under this Announcement): \$ 150,000

D. EXPECTED NUMBER OF AWARDS

- DOE anticipates making 14 to 22 awards under this Announcement depending on the size of the awards.

E. ANTICIPATED AWARD SIZE

- DOE anticipates that awards will be in the \$ 0.15 to 2 million range for the total project period (DOE funds).

F. PERIOD OF PERFORMANCE

- DOE anticipates making awards that will run for up to 3 years, with one or more phases with go/no-go decision points at end of each phase. A decision will be made for continuation, redirection, or termination of the project at each decision point.

G. TYPE OF PROPOSAL

- DOE will accept only new proposals under this Research Call and not any request for renewal of a current project.

SECTION III - ELIGIBILITY INFORMATION

A. ELIGIBLE OFFERORS

Only DOE National Laboratories (Federally Funded Research and Development Centers, or FFRDCs) are eligible to apply as prime. They are responsible for organizing and leading the project team. Industrial participation is a mandatory requirement for designated research topics. Collaborations involving educational institutions, industrial companies, and R&D organizations (FFRDCs as well as others) are encouraged.

B. COST SHARING OR MATCHING

This Research Call (excluding the **Area of Interest 1**) requires cost share to ensure pro-active industrial involvement, risk-taking by industry, and to encourage enabling technology development for widespread application in industry for the development of energy efficient industrial processes. There will be no waivers of this cost share requirement. DOE Laboratories cannot meet these cost sharing requirements themselves, and must therefore satisfy them through their industrial partner(s) participation in the project.

Only proposals submitted with the following cost share requirements will be considered:

- For applied research and/or development projects (Stage 3): a 20% minimum cost share from non-federal sources; and
- For projects involving commercial demonstration of technologies (Stage 4): a 50% minimum cost share from non-federal sources.

As an example, the minimum cost share requirement for a hypothetical R&D project with a total cost of \$1,000,000 would be:

Total Project Cost:	\$1,000,000
Non-federal share, 20%	\$200,000
DOE share, 80%	\$800,000

Please note that the required minimum cost share is **not** based on 20% of the DOE share, but is based on 20% of the Total Project Cost.

Cost share contributions need not be monetary (i.e., in-kind contributions are allowed). Industrial and/or supplier involvement and cost sharing above the required minimums is strongly encouraged. In evaluating the cost share, the percentage calculated from the cost information will be rounded to the nearest full percentage. Prior costs (e.g., costs for prior R&D, patents, or

to develop technical reports) should not be proposed and will not be considered as cost share. Cost share may not be other federal funding.

If additional DOE Laboratories are teaming partners, their participation will be funded directly by DOE and the costs associated with each laboratory's participation will count towards the Government's cost share. Additionally, the non-federal cost sharing requirement will be based on the total cost of the project including all DOE laboratory portions of the effort, as indicated above.

Proposals should clearly identify the sources and amounts of cost sharing proposed. The offeror must include a summary table showing the cost-sharing breakout for each of the identified portions of the project (as specified above) that are included in their proposal. This will facilitate DOE's evaluation of the proposals.

Responsibility in the event that an industrial partner withdraws: Cost share is due, proportionate to the government funds spent, as specified in the agreement, even if an industrial partner withdraws from the agreement.

C. OTHER ELIGIBILITY REQUIREMENTS

Authorization for DOE/ National Nuclear Security Administration (NNSA) FFRDCs. The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the proposal. The following wording is acceptable for this authorization.

"Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory."

- The FFRDC contractor effort, in aggregate, shall not exceed 80% of the total estimated cost of the project.

SECTION IV: SUBMISSION INSTRUCTIONS

A. SUBMISSION INSTRUCTIONS

Proposals shall be submitted electronically to the following email address **no later than May 30, 2008 at 11:59:59 PM Eastern Daylight Time:**

Joseph B. Renk III, Project Manager
US Department of Energy
National Energy Technology Laboratory
626 Cochran's Mill Road
P.O. Box 10940
Pittsburgh, PA, 15236-0940

Joseph.Renk@netl.doe.gov

The applicant is encouraged to request a return notification to verify receipt of proposal.

B. LETTER OF INTENT

Letter of Intent

- Offerors are requested to submit a letter of intent by May 02, 2008. This letter should include the name of the offeror, the title of the project, the name of the Project Director/Principal Investigator(s), the amount of funds requested, and a one-page abstract. Letters of intent and accompanying abstracts will be used by DOE to organize and expedite the merit review process. They should not contain any proprietary or sensitive business information. Failure to submit such letters will not negatively affect a responsive proposal submitted in a timely fashion. The letter of intent should be sent by e-mail to Joseph.Renk@netl.doe.gov.

C. LATE APPLICATIONS, AMENDMENTS AND WITHDRAWALS OF PROPOSALS

A proposal or amendment of a proposal shall be considered timely if it is received on or before the closing date indicated above. Proposals or amendments of proposals may be withdrawn by written notice from an authorized representative to the above address via e-mail or in writing.

A second proposal or amendment may then be submitted. The second or subsequent proposal must be submitted before the closing date to be considered. In the event that two or more proposals are received for the same project with the same title, the proposal with the latest postmark will be considered for review. Therefore, it is important that you not merely make page changes and re-submit portions of the proposal that are amended. A complete amended proposal must be sent.

Proposals or amendments received after the closing date will not be considered.

SECTION V: APPLICATION PREPARATION

A. PREPARATION

It is requested that the entire proposal be single spaced, 1" margins (top, bottom, left, right), and when printed will fit on size 8 1/2" by 11" paper. The type must be legible and not smaller than 11 point. The Technical Content (see Section V Part E) shall not exceed thirty (30) pages of the total page limit. Evaluators will review only the number of pages specified. Any proposals exceeding these limitations may result in a weakness to their overall scored based on technical evaluation Criterion 5 – Qualifications and Resources. In order to produce a comprehensive application for this Research Call, the offeror shall address, at a minimum, the areas listed in the Table of Contents below. The offeror shall use the following Table of Contents:

Section	Page
Field Work Proposal Cover Sheet	i
Public Abstract	ii
Table of Contents	iii
List of Tables	iv
List of Figures	v
List of Acronyms	vi
Detailed Cost Analysis	vii
Technical Content	#
Market and Technical Objectives	#
Potential Energy, Carbon, Economic and Environmental Benefits	#
Technical Approach	#
Qualifications and Resources	#
Appendices	#
Statement of Work (SOW)	A

B. RESEARCH CALL PROPOSAL COVER SHEET

The form must be completed and signed by an official who is authorized to act for the applicant and project team members (other FFRDCs) and who can commit the applicant to comply with the terms and conditions of award, if one is issued.

C. PUBLIC ABSTRACT

This section shall contain a public abstract of not more than one (1) typewritten page. The offeror shall provide a point of contact for coordination, preparation and distribution of press releases. The public abstract shall not contain confidential, proprietary, or otherwise sensitive information as it may be released by the DOE to the general public at any time.

D. DETAILED COST ANALYSIS

The applicant shall provide detailed cost information pertaining to their proposal. At a minimum, the cost analysis shall provide information regarding personnel costs, overheads, travel, equipment, and supplies. Include a supplemental schedule that identifies the labor hours, labor rates, and cost by labor classification for each budget year. Also indicate the basis of the labor classification, number of hours, and labor rates.

E. TECHNICAL CONTENT

1. Mandatory Other Attachment

Project Narrative File - Mandatory Other Attachment

The project narrative must not exceed 30 pages, when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left, and right). EVALUATORS WILL REVIEW ONLY 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 proposal. See Part VIII.D for instructions on how to mark proprietary proposal information. Save the information in a single file named "Project.pdf."

The project narrative should be organized into following five sections, corresponding to five Merit Review Evaluation Criteria listed:

- Market and Technical Objectives.

This section should include adequate background of how the proposed technology will address the technical areas of interest outlined in the Announcement (Background Section). Identify Platform and Focus Area. Address the potential superiority of the proposed technology over currently used process. This section should include identification and characterization of the potential markets that would be impacted by the successful development and commercial implementation of the proposed technology. This section will be evaluated on characterization of energy consumption, economic size, annual growth, and competitive environment of the market space. Finally, this section should also include identification of the current and target stages of technical and commercial development in the Stage-Gate methodology.

- Potential Energy, Carbon, Economic, and Environmental Benefits.

This section should adequately discuss the potential for the proposed technology to contribute to the goal of reducing energy intensity of the domestic manufacturing industry. The energy savings will be evaluated by considering the adequacy, technical merit, assumptions, references and completeness of the offeror's energy savings estimates (in TBtu/yr and in terms of energy intensity) and calculations (as provided by the offeror). The timing of the energy savings contribution is also an important evaluation factor as the new technology should be in commercial use as soon as practicable to contribute fully to this goal. The potential of the proposed technology to reduce greenhouse gas emissions and other environmental emissions as well as reduce solid and liquid wastes, in comparison to the technology currently in commercial use, will be evaluated in this section. The environmental benefits will be evaluated by considering the adequacy, technical merit, assumptions, references and completeness of the offeror's estimates. This section should include the potential economic benefits of the proposed technology over the current technology, considering all major cost-benefit factors including as appropriate improvements in productivity, product yield, product quality, and increase/decrease in capital, operating, maintenance, energy and environmental compliance costs. This section should also include the completeness and validity of assumptions used in developing the benefits ascribed to the technology.

- Commercialization Plan and Industry Involvement.

This section should include adequate discussion of the commercialization strategy for the proposed technology and of the intellectual property rights and/or

institutional alliances to execute the commercialization strategy. The responsible team member for this function must be clearly defined. The commercialization plan should be in alignment with the technical work plan and include a discussion of the Stage Gate process that will be used to plan the tasks, monitor the progress, and identify critical milestones. This section should also include adequate discussion of the viability and practicality of the proposed technology to meet the needs of the target market in a cost effective manner considering potential technical, regulatory, economic, environmental, production or other issues impacting market success. Proposals for Stage 4 projects should discuss the commercialization potential in more depth than proposals for Stage 2 or 3 projects, including, for example, feedback from potential end-users about performance, benefits and costs. Adequacy of market positions and commercial interests of the industry partner(s) should be discussed in this section. Finally, this section should include adequate discussion of the corporate commitment to the proposed project from inception through commercialization in the marketplace.

[Note: For Area of Interest 1 (stage 2, Concept Definition Studies), a preliminary commercialization approach and discussions of the intellectual property background will be required, instead of the above requirements for a commercialization plan.]

- Technical Approach.
This section should include validity and completeness of the proposed technical approach and likelihood of success based on the current status of the proposed technology and the scientific merit of the proposed approach. This section should address application of the Stage-Gate methodology including identification of and criteria for go/no-go decisions, and identification of success/failure metrics to enable effective project management. Adequacy, appropriateness, and reasonableness of the proposed work and budget distribution among the team members to accomplish the stated objectives should be adequately discussed in this section.
- Qualifications and Resources.
This section should include evidence of current organization experience and success in similar projects which lead to successful technology development and commercialization or technology transfer to commercial product(s). This section should include adequate discussion of experience and availability of key personnel to complete the proposed project, including personnel involved in technical, commercialization and/or technology transfer. Finally, this section should include adequate discussion of adequacy (quality, availability and appropriateness) of facilities and equipment to accommodate the proposed project.

2. Optional Other Attachment

Project Summary/Abstract File

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 offeror and other team members, 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). This document must not include any proprietary or sensitive business information as DOE may make it available to the

public. The project summary must not exceed 2 pages when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point. Save this information in a file named "Summary.pdf."

Resume File

Provide a resume for each key person proposed, including subawardees and consultants if they meet the definition of key person. A key person is any individual who contributes in a substantive, measurable way to the execution of the project. Save all resumes in a single file named "resume.pdf."

Each resume must not exceed 2 pages when printed on 8.5" by 11" paper with 1" margins (top, bottom, left, and right) with font not smaller than 11 point and should include the following information, if applicable:

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

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 instead of publications.

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

Budget Files

Provide Budget Summary tables for the total project and for each year of the project. The tables should include estimated costs for various budget categories such as personnel (including fringe benefits), equipment, materials and supplies, travel, subcontract, and other direct costs and indirect costs (general and administrative). The table should also indicate the distribution of the total budget (for each year and for the total project) between DOE funds and Cost Share funds. Save the information in a single file named "Budget.xls."

Budget Justification File

You must justify the costs proposed in each Cost Category (e.g., identify key persons and personnel categories and the estimated costs for each person or category; provide a list of equipment and cost of each item; identify proposed subaward/consultant work and cost of each subaward/consultant; describe purpose of proposed travel, number of travelers and number of travel days; list general categories of supplies and amount for each category; and provide any other information you wish to support your budget). Provide the name of your cognizant/oversight agency, if you have one, and the name and phone number of the individual responsible for negotiating your indirect rates. You must provide a letter from each third party contributing cost sharing (i.e., a party other than the laboratory submitting the proposal) which states that the third party is committed to providing a specific minimum dollar amount of cost sharing. In the budget justification, identify the following information for each third party contributing 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. Save the budget justification information in a single file named “Budget_Justification.pdf.”

Commitment Letters

The proposal must include commitment letters from its industrial and other cost share partners stating that they are committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Save all authorization letters in a single file named “CSCL_Attachment.pdf.”

Authorization for DOE/NNSA FFRDCs

Save the Authorization for DOE/NNSA FFRDCs, as specified in Part III.C. Other Eligibility Requirements, in a single file named “FFRDC_Auth.pdf.”

STATEMENT OF WORK (Appendix A) INSTRUCTIONS

A Statement of Work shall be developed that addresses how the project objectives will be met. The Statement of Work must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. This section shall be restricted to 1-3 pages in length. The Statement of Work 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.

TITLE OF WORK TO BE PERFORMED

(Insert the title of work to be performed. Be concise and descriptive. Avoid non-descriptive terms, such as ‘novel’ or ‘innovative’)

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 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 (Optional)

(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:

- Task 1.1 - (Report Description)
- Task 2.2 - (Report Description)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the DOE Project Officer at the NETL 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.

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, or other location specified by the DOE Project Officer.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Peer Review Meeting to be held at DOE Headquarters in Washington, D.C., or other location specified by the DOE Project Officer.

SECTION VI: EVALUATION AND SELECTION

A. 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 Research Call has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the Research Call.

B. MERIT REVIEW CRITERIA

Proposals submitted in response to this Research Call will be evaluated and scored in accordance with the criteria and weights listed below:

Criterion 1: Market and Technical Objectives

Weight: [25%]

- Adequate discussion of how the proposed technology will address the technical areas of interest outlined in the Announcement and the potential superiority of the proposed technology over currently used process.
- Identification and characterization of the potential markets that would be impacted by the successful development and commercial implementation of the proposed technology. Characterization of energy consumption, economic size, annual growth, and competitive environment of the market space will be evaluated.
- Identification and in depth discussion of the current and target stages of technical and commercial development in the Stage-Gate methodology.

Criterion 2: Potential Energy, Carbon Emissions Reduction, Economic, and Environmental Benefits

Weight: [25%]

(Bullets are listed in descending order of importance with major emphasis on energy intensity reduction)

- The potential for the proposed technology to contribute to the goal of reducing energy intensity of the domestic manufacturing industry. The energy savings will be evaluated by considering the adequacy, technical merit, assumptions, references and completeness of the offeror's energy savings estimates (in TBtu/yr and in terms of energy intensity) and calculations (as provided by the offeror). The timing of the energy savings contribution is also an important evaluation factor as the new technology should be in commercial use as soon as practicable to contribute fully to this goal.
- The potential of the proposed technology to reduce greenhouse gas emissions and other environmental emissions as well as reduce solid and liquid wastes, in comparison to the technology currently in commercial use. The environmental benefits will be evaluated by considering the adequacy, technical merit, assumptions, references and completeness of the offeror's estimates.
- The potential economic benefits of the proposed technology over the current technology, considering all major cost-benefit factors including as appropriate improvements in productivity, product yield, product quality, and increase/decrease in capital, operating, maintenance, energy and environmental compliance costs.
- The completeness and validity of assumptions used in developing the benefits ascribed to the technology.

Criterion 3: Commercialization Plan and Industry Involvement**Weight: [20%]**

- Adequate discussion of the commercialization strategy for the proposed technology and of the intellectual property rights and/or institutional alliances to execute the commercialization strategy. The responsible team member for this function must be clearly defined. The commercialization plan should be in alignment with the technical work plan and include an adequate discussion of the Stage Gate process that will be used to plan the tasks, monitor the progress, and identify critical milestones.
- Adequate discussion of the viability and practicality of the proposed technology to meet the needs of the target market in a cost effective manner considering potential technical, regulatory, economic, environmental, production or other issues impacting market success. Proposals for Stage 4 projects should discuss the commercialization potential in more depth than proposals for Stage 3 projects, including, for example, feedback from potential end-users about performance, benefits and costs.
- Adequacy of market positions and commercial interests of the industry partner(s).
- Adequate discussion of the corporate commitment to the proposed project from inception through commercialization in the marketplace.

Criterion 4: Technical Approach**Weight: [20%]**

- Validity and completeness of the proposed technical approach and likelihood of success based on the current status of the proposed technology and the scientific merit of the proposed approach.
- Application of the Stage-Gate methodology including identification of and criteria for go/no-go decisions, and identification of success/failure metrics to enable effective project management.
- Adequacy, appropriateness, and reasonableness of the proposed work and budget distribution among the team members to accomplish the stated objectives.

Criterion 5: Qualifications and Resources**Weight: [10%]**

- Evidence of current organization experience and success in similar projects which led to successful technology development and commercialization or technology transfer to commercial product(s).
- Adequate discussion of experience and availability of key personnel to complete the proposed project, including personnel involved in technical, commercialization and/or technology transfer.
- Adequate discussion of adequacy (quality, availability and appropriateness) of facilities and equipment to accommodate the proposed project.

C. OTHER SELECTION FACTORS

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

These factors, while not indicators of the Application's merit, e.g., technical excellence, cost, Applicant's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the Applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall R&D objectives. Therefore, the following Program Policy Factors may be used by the Selection Official to assist in determining which of the ranked application(s) shall receive DOE funding support.

- It may be desirable to select for award a group of projects which represents a diversity of technical approaches and methods;
- It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives;
- It may be desirable to select different kinds and sizes of organizations in order to provide a balanced programmatic effort and a variety of different technical perspectives;
- It may be desirable, because of the nature of the energy source, the type of projects envisioned, or limitations of past efforts, to select a group of projects with a broad or specific geographic distribution;
- It may be desirable to select project(s) of less technical merit than other project(s) if such a selection will optimize use of available funds by allowing more projects to be supported and not be detrimental to the overall objectives of the program; and
- It may be desirable to select project(s) for award based on the Applicant's past Federal Award performance with respect to its potential effect on accomplishment of portfolio goals.

The above factors will be independently considered by the Selection Official in determining the optimum mix of applications that will be selected for support. These policy factors will provide the Selection Official with the capability of developing, from the competitive Research Call, a broad involvement of organizations and organizational ideas, which will both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

D. SUBMISSIONS FROM SUCCESSFUL OFFERORS.

If selected for award, DOE 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;
- Plan for compliance with National Environmental Policy Act (NEPA); and
- Name and contact information of the cognizant Contracting Officer having jurisdiction over the FFRDC.

E. SUBMISSION DATES AND TIMES.

Pre-proposal Due Date.

- Pre-proposals are not required.

Proposal Due Date.

- Proposals must be received by May 30, 2008, 11:59:59 PM Eastern Daylight Time. You are encouraged to transmit your proposal well before the deadline. PROPOSALS 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.

SECTION VII - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

Notice of Selection

- DOE will notify offerors selected for award. This notice of selection is not an authorization to begin performance.
- Organizations whose proposals have not been selected will be advised as promptly as possible.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

- **Debarred and Suspended Parties**
Applicants must not make any sub-award or permit any sub-award to any party which is debarred, suspended, or is otherwise excluded from or ineligible for Federal awards. The list of parties excluded from Federal procurement and non-procurement programs can be accessed through the Excluded Parties List System (EPLS) at <http://epls.arnet.gov>.
- **National Environmental Policy Act (NEPA) Requirements**
All Offerors selected for negotiations shall complete the necessary NEPA compliance requirements in coordination with their local DOE Field Office. Documentation of the completed NEPA documentation will need to be provided prior to awarding funding for the project. Offerors are restricted from taking an irreversible action prior to DOE reaching a final NEPA decision regarding a proposed project. Irreversible actions include demolition of existing buildings, site clearing, ground breaking, construction, and/or site-specific detailed design. Provided DOE has authorized the work, this restriction does not preclude the Applicant from developing plans, preliminary designs, or performing other necessary support work prior to DOE reaching its final NEPA decision.
- **Energy Policy Act (EPA) Requirements**
Energy Policy Act Requirements apply to this Research Call. Industrial partners involved with any project will be required to submit EPA certifications before any DOE funding will be awarded to the Applicant teaming arrangement.

SECTION VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this Research Call will sent directly to the National Laboratories.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all proposals received in response to this Announcement and to select any proposal, 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 PROPOSAL INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the offeror, should be included in a proposal 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 offeror includes the following legend on the first page of the project narrative and specifies the pages of the proposal which are to be restricted:

“The data contained in pages _____ of this proposal 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 offeror receives an award as a result of or in connection with the submission of this proposal, 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 offeror.”

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 offeror) 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 offeror, by submitting its proposal, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing a proposal. 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.

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

Offerors may request a waiver 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.

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.

REFERENCE MATERIAL

Appendix A – Definitions

“Amendment” means a revision to a Program Announcement.

"Budget" means the cost expenditure plan submitted in the Proposal, including both the DOE contribution and the Offeror Cost Share.

"Consortium (plural consortia)" means the group of organizations or individuals that have chosen to submit a single Proposal in response to a Program Announcement.

"Contracting Officer" means the DOE official authorized to execute Awards on behalf of DOE and who is responsible for the business management and non-program aspects of the Acquisition process.

"Cost Sharing" means the respective share of Total Project Costs to be contributed by the Offeror and by DOE. The percentage of Offeror Cost Share is to be applied to the Total Project Cost (i.e., the sum of Offeror plus DOE Cost Shares) rather than to the DOE contribution alone.

“Central Contractor Registry (CCR)” is the primary database which collects, validates, stores and disseminates data in support of agency missions. Program Announcements which require proposal submission through Grants.gov require that the organization first be registered in the CCR at <http://www.grants.gov/CCRRegister>.

“E-Business Point of Contact (POC)” is the individual who is designated as the Electronic Business Point of Contact in the CCR registration. This person is the sole authority of the organization with the capability of designating or revoking an individual’s ability to submit grant applications on behalf of their organization through Grants.gov.

“Federally Funded Research and Development Center (FFRDC)” means a research laboratory as defined by Federal Acquisition Regulation 35.017.

“Grants.gov” is the “storefront” web portal which allows organizations to electronically find and apply for competitive grant opportunities from all Federal grant-making agencies. Grants.gov is THE single access point for over 900 grant programs offered by the 26 Federal grant-making agencies. <http://www.grants.gov>

"Key Personnel" means the individuals who will have significant roles in planning and implementing the proposed Project on the part of the Offeror and Participants, including FFRDCs.

"Offeror" means the legal entity or individual signing the Proposal. This entity or individual may be one organization or a single entity representing a group of organizations (such as a Consortium) that has chosen to submit a single Proposal in response to a Program Announcement.

"Participant" for purposes of this Program Announcement only, means any entity, except the Offeror substantially involved in a Consortium, or other business arrangement (including all parties to the Offeror at any tier), responding to the Program Announcement.

"Project" means the set of activities described in a Proposal, State plan, or other document that is approved by DOE for funding.

“Proposal” is the term used in DOE’s Industry Interactive Procurement System (IIPS) meaning the documentation submitted in response to a Program Announcement.

"Selection" means the determination by the DOE Selection Official that negotiations take place for certain Projects with the intent of awarding funding.

"Selection Official" means the DOE official designated to select Proposals for negotiation toward Award under a subject Program Announcement.

"Total Project Cost" means all the funds to complete the effort proposed by the Offeror, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the Offeror as Cost Sharing.