

## **Appendix A**

### **Request for Pre-proposals 2005**

# **REQUEST FOR PRE-PROPOSALS**

**RFP Notice 2005**

## ***Combustion Byproducts Recycling Consortium***

*a program of the*

National Mine Land Reclamation Center

*in cooperation with the*

U.S. Department of Energy

National Energy Technology Laboratory

**Pre-Proposal Application Due Date: July 31, 2005**

**Combustion Byproducts Recycling Consortium (CBRC)**  
***Request for Pre-Proposals 2005***

**Background**

Each year, over 100 million tons of solid byproducts are produced by coal-burning electric utilities in the United States. Annual production of flue gas desulfurization (FGD) byproducts continues to increase as the result of more stringent sulfur emission restrictions. In addition, stricter limits on NO<sub>x</sub> emissions mandated by the 1990 Clean Air Act have resulted in utility burner/boiler modifications that frequently yield higher carbon concentrations in fly ash, which restricts the use of the ash as a cement replacement. Controlling ammonia in ash is also of concern. If newer, "clean coal" combustion and gasification technologies are adopted, their byproducts may also present a management challenge.

The objective of the Combustion Byproducts Recycling Consortium (CBRC) is to develop and demonstrate technologies to address issues related to the recycling of byproducts associated with coal combustion processes. A goal of CBRC is that these technologies, by the year 2010, will lead to an overall ash utilization rate from the current 34% to 50% by such measures as increasing the current rate of FGD byproduct use and increasing in the number of uses considered "allowable" under state regulations. Another issue of interest to the CBRC would be to examine the environmental impact of both byproduct utilization and disposal.

No byproduct utilization technology is likely to be adopted by industry unless it is more cost-effective than landfilling. Therefore, it is extremely important that the utility industry provide guidance to the R&D program. Government agencies and private-sector organizations that may be able to utilize these materials in the conduct of their missions should also provide input. The CBRC will serve as an effective vehicle for acquiring and maintaining guidance from these diverse organizations so that the proper balance in the R&D program is achieved.

The CBRC is sponsored by the U.S. Department of Energy's National Energy Technology Laboratory (U.S. DOE-NETL) and managed by the National Mine Land Reclamation Center (NMLRC) at West Virginia University (WVU). For more information on the CBRC program including projects, funding, or pre-proposal application procedures and forms, please access the CBRC web site at:

**<http://wwwri.nrcce.wvu.edu/programs/cbrc>**

## **Submission of Pre-Proposals**

A copy of the pre-proposal application must be received by **July 31, 2005** before 4:30 PM, EST by the National Center of the Combustion Byproducts Recycling Consortium located at the National Mine Land Reclamation Center at West Virginia University. An electronic copy is preferred. However, a paper copy will be accepted. If an electronic copy is the method selected, it must be submitted in PDF format. Send pre-proposals to the CBRC National Center at the following address:

For electronic submission:

[tvandivo@wvu.edu](mailto:tvandivo@wvu.edu)

For submission of paper copy:

Tamara Vandivort, Consortium Manager  
Combustion Byproducts Recycling Consortium  
Room 202 NRCCE Bldg.  
150 Evansdale Drive; PO Box 6064  
Morgantown, WV 26506-6064  
Telephone (for courier service): (304) 293-2867

Please note that misdirected pre-proposals shall be deemed late and returned to the applicant. All pre-proposals shall be complete at time of submission. Later changes or addendums will not be accepted. Electronic copies of pre-proposals must be submitted in PDF format. Paper copies of pre-proposals must be mailed or sent via commercial carriers.

**FAXED PRE-PROPOSALS WILL NOT BE ACCEPTED.**

## **Program Funding**

Applicants in any of the 50 United States, the District of Columbia, and U.S. territories may apply through this request for pre-proposals. It is anticipated that up to \$1.25 million will be available from the U.S. Department of Energy - National Energy Technology Laboratory to award up to 6 projects. The maximum length of any project awarded under this RFP will be three years. The number of initial awards made under this RFP and the year-to-year continuation of projects awarded under this RFP are contingent upon availability of DOE funding during Fiscal Years 2006 - 2008. The CBRC reserves the right to accept or reject in whole or in part any and all pre-proposals.

Applicants will be notified as to whether or not their pre-proposal has been accepted. If accepted a request for a full proposal will be made. It is expected that

funds will be available in April, 2006. Multiple year projects will have annual performance evaluations. Funding beyond the first year of multiple year projects is contingent upon the results of the annual performance evaluation in addition to the availability of DOE funds.

Applicants may submit more than one pre-proposal but each pre-proposal must address a different idea, topic, or technical approach and may include salaries, travel, equipment, materials, and services not including fees or profit.

**ANY PRE-PROPOSAL SUBMITTED MUST BE SPECIFIC TO ONLY ONE PARTICULAR REGIONAL RESEARCH PRIORITY AND/OR ONLY ONE PARTICULAR NATIONAL RESEARCH PRIORITY FOR WHICH THAT PRE-PROPOSAL IS TO BE CONSIDERED REGARDLESS OF THE PHYSICAL LOCATION OF THE PROJECT OR PROJECT RESEARCHERS.**

**DUPLICATE PRE-PROPOSALS SUBMITTED UNDER MORE THAN ONE REGIONAL RESEARCH PRIORITY AND/OR MORE THAN ONE NATIONAL RESEARCH PRIORITY WILL NOT BE CONSIDERED NOR EVALUATED FOR FUNDING.**

**THE REGIONAL AND NATIONAL RESEARCH PRIORITIES INDICATED ON THE PRE-PROPOSAL WILL BE WEIGHTED EQUALLY IN THE EVALUATION OF THE PRE-PROPOSAL.**

A minimum cost-share of 25% is required and the applicant must provide some portion of this percentage. The remainder may come from academia, industry, or other non-federal sources. Signed letters of support indicating specific actual cash and/or in-kind services meeting the minimum 25% cost-share requirement will be required as part of the full proposal application for those whose pre-proposals are accepted.

The CBRC requests pre-proposals for research expected to begin April 15, 2006. Included in this document are instructions for pre-proposal preparation, including a list of research priorities and information on the pre-proposal review process.

#### **Anticipated CBRC Research Program Schedule**

July 31, 2005	One electronic or paper copy of the pre-proposal due to CBRC's National Center at the National Mine Land Reclamation Center located at West Virginia University
September 30, 2005	Pre-application decisions made and applicants notified
December 15, 2005	Full proposals due for those whose pre-proposals were accepted

March 1, 2006                      Funding decisions made and applicants notified

April 15, 2006                    Awards distributed

### **Reporting Requirements**

Funded projects will have the following reporting requirements:

- #      Quarterly progress reports
- #      Quarterly financial reports
- #      Draft final report
- #      Comprehensive final report
- #      One write-up for the CBRC newsletter, *Ashlines*

Note that reports and the article for *Ashlines* must be submitted electronically in Word or WordPerfect.

### **The CBRC Consortium Structure**

There are four major elements of the CBRC: the Department of Energy - National Energy Technology Laboratory, the National Steering Committee (NSC), regional advisors/reviewers for each of the three regions, and program management. Each element is described below:

**Department of Energy - National Energy Technology Laboratory:** The Department of Energy - National Energy Technology Laboratory (DOE-NETL) is the sponsoring agency which provides funding for the CBRC. DOE-NETL also provides program oversight.

**National Steering Committee:** The National Steering Committee (NSC) is the key element of the CBRC. All decisions on how the CBRC conducts business are made by consensus of the NSC. Critical roles and responsibilities of the NSC include:

- !      approving overall CBRC structure and timetables,
- !      selecting from its membership chairpersons for the regional reviewers/advisors
- !      authorizing request for pre-proposals and full proposals (RFP's),
- !      evaluating both pre-proposals and full proposals, and
- !      making project funding decisions.

**Regional Advisors/Reviewers:** The types of coals burned by electric utilities and the technologies employed for emission control greatly affect the characteristics of the

byproducts that are produced. The NSC recognized that these characteristics often vary from region to region. Regional prioritization of research needs is also dictated by the cost of transportation and the state-to-state differences in regulations governing byproduct disposal and utilization. For this reason, regional advisors/reviewers have been solicited for the eastern, midwestern, and western regions of the United States.

The regional advisors/reviewers chairperson has the primary responsibility for selecting the reviewers/advisors for that region. The roles and responsibilities of the reviewers/advisors are as follows:

- ! identify research priorities of the region for use in the RFP,
- ! review, score, and rank full proposals received in accordance with research priorities,
- ! review technical progress on projects that are funded, and
- ! report important results to the National Steering Committee.

**Program Management:** The National Mine Land Reclamation Center (NMLRC) at West Virginia University serves as the National Center for CBRC. Oversight is provided by DOE-NETL. The roles and responsibilities under the direction of the NMLRC include the following:

- ! soliciting members to serve on the National Steering Committee,
- ! scheduling, organizing, and facilitating National Steering Committee meetings,
- ! providing draft pre-proposals and RFP's to the National Steering Committee
- ! developing final pre-proposals and RFP's
- ! developing pre-proposal and RFP dissemination strategies
- ! developing a scoring/ranking system for use by reviewers
- ! compiling the results of reviews for the National Steering Committee
- ! awarding and administering research contracts
- ! assuring that contractors meet all performance, reporting, and budget requirements
- ! facilitating communications between the committees, DOE-NETL, research contractors, and external agencies, and
- ! disseminating research results via seminars, newsletters, internet, etc.

There are also three Regional Centers: The Eastern, Midwestern, and Western Regional Centers. The regional centers for the CBRC are located at a university within each region. The Eastern Regional Center is located at the University of Kentucky, the Midwestern at the Southern Illinois University at Carbondale, and the Western at the University of North Dakota. A director at each regional center oversees the progress of the CBRC projects for their particular region, facilitates communications with the National Center Consortium Manager, Regional Chair, and regional advisors/reviewers.

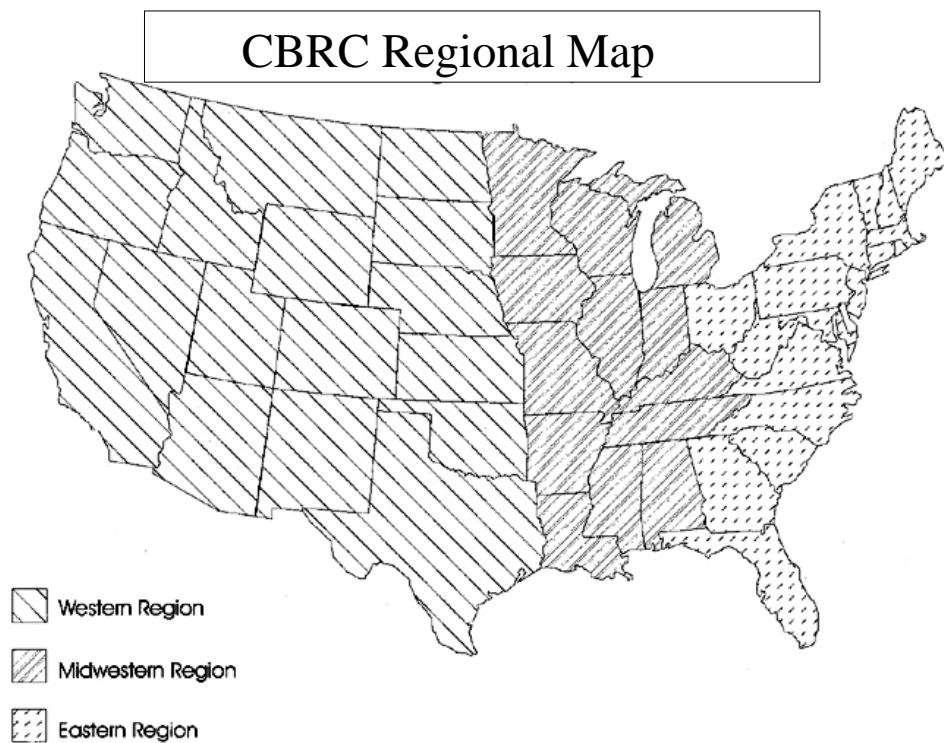
### **Advantages of the CBRC Consortium Structure**

- ! The public will be better served if research priorities are based on the common needs of both industry and government and issues critical to the region are addressed.
- ! Contracting procedures will be streamlined by having only one federal contact between DOE-NETL and the CBRC managers. The CBRC managers will be responsible for assuring that the technical and budget-reporting requirements associated with the performance of individual research contracts are as efficient and effective as possible.
- ! The structure of the regional advisors/reviewers will ensure that pre-proposals will meet regional technical needs and that the research does not duplicate on-going work.
- ! Steering committee members and regional advisors/reviewers may be exposed to innovative research ideas that would not have been revealed via their own efforts. Even if the National Steering Committee as a whole decides not to fund a particular proposal, the individual participants may choose to work with the proposing organization using other funding sources.



## CBRC Regional Categories

The fifty United States and its territories make up three specific CBRC regions. Each region has identified priorities that, if met, should increase the utilization of coal combustion byproducts (CCB's) within that region. Although many priorities are shared between regions, pre-proposals will be evaluated separately by region in order to help that region meet its own priorities. The map below shows which states fall within these three CBRC regions.



## **Regional Research Area Priorities**

### **SELECT NO MORE THAN ONE**

#### **Eastern Region Research Priorities**

The eastern region has traditionally relied on coals produced in the eastern U.S. and produced class F fly ashes. Imports of subbituminous Indonesian coals and bituminous South American coals are contributing to changing ash characteristics. Ashes from blended coals and from coal feeds with no eastern bituminous component are becoming more common. Along with the midwestern region, the eastern states have had a longer history of producing FGD materials. For utilities that have ponded or landfilled FGD and fly ash products, the volumes of material, combined with land-use restrictions, may lead to increased incentive to utilize previously-disposed materials.

- E1** High volume utilization of CCBs, including ponded/stored fly ash and FGD material; off-spec fly ash; and ash with inconsistent quality.
- E2** Impact of changing air pollution control technologies on potential uses of CCBs and methods to keep them in use.
- E3** FGD gypsum in wallboard and other manufactured products with limited negative environmental impact.
- E4** Ashes from co-combustion of different coal ranks (Eastern bituminous with other coals [PRB or non-U.S. sub-bituminous, western U.S. bituminous, South American bituminous, etc.]) or different ash chemistries (high Fe and/or high S with high Ca), or ashes from co-combustion of coal and non-coal fuels (tires, pet coke, biomass).
- E5** Material handling and transportation issues associated with high volume uses of ash and scrubber gypsum (i.e., reclaiming material from ponds, rail and barge loadout/unloading, dewatering/drying material, spreaders for agricultural use, etc.).

#### **Midwestern Region Research Priorities**

The Midwestern region utilizes coals from Eastern states, Illinois coal basin, as well as from Powder River basin. Therefore, it produces both C-ash and F-ash. In addition, some power plants are blending biomass and pet coke with coals. Thus, this region uses high sulfur, low-sulfur, and blended coals. Along with the eastern region, the Midwestern states have had a longer history of producing FGD materials.

- M1** Large-volume beneficial use applications of new and ponded conventional CCBs (fly ash, bottom ash, boiler slag) and FGD byproducts (wet scrubber byproducts,

fluidized-bed combustion byproducts) in:

- \$ mining, reclamation, acid mine drainage, and mine-fill applications
- \$ cement-concrete, construction, building products, soil amendment, soil stabilization, highways, liners, soil cover, etc.
- \$ agricultural applications, with strong consideration of mercury impacts

- M2** Impacts of changing air quality standards on CCBs and FGD byproducts quality, with particular emphasis on mercury, and their impacts on large volume beneficial use applications and products development.
- M3** Removing regulatory and socio-political barriers at the national, state and local levels to beneficially utilize CCBs.
- M4** Synergistic management of CCBs in product development and large volume applications.
- M5** Characterization studies, with focus on large-volume beneficial use, on CCBs generated from various coal blends, blends of coal and alternate fuels such as biomass and petcoke, and gasification byproducts.

Environmental impacts and techno-economic evaluations must be integral parts of a proposal.

### **Western Region Research Priorities**

The Western Region needs to address continuing technical and environmental issues that can negatively impact the potential to maximize the use of coal combustion byproducts (CCBs) in the western U.S. Western Region industry representatives indicate that CCB projects should focus on utilization of fly ash, FGD material, and bottom ash in order of importance. Changes in quality and performance of CCBs from emerging emission control technologies are also a challenge to the use of CCBs in the Western Region.

- W1** Development and demonstration of high-volume CCB utilization in geotechnical, mining, and agricultural applications potentially including assessments of impacts to surface water and groundwater quality.
- W2** Product development investigations on currently produced CCBs, CCBs from coal-fuel blends and CCBs resulting from changing emission control technologies.
- W3** Development, testing, and proof-of-concept evaluations for CCB-containing products with potential to move high volumes of CCBs (100,000 tons or more) to market.

- W4** Advance and maintain the use of CCBs in concrete by demonstrating and testing CCB use in high-performance concrete and investigating the impact of CCB variability from single, multiple, and blended sources on concrete, including high-performance applications.

### **National Research Priorities**

The priorities listed below are national in scope and are meant to complement, not supersede the listed regional priorities. The National Priorities are all of equal importance to CBRC; i.e., the order in which they appear does not reflect their relative level of importance. The priorities are labeled (N1, N2, etc.) solely for reference purposes when submitting pre-proposals.

### **SELECT NO MORE THAN ONE NATIONAL PRIORITY THAT BEST FITS THE PROJECT BEING PROPOSED**

- N1** Project involving the acquisition and dissemination of information on the environmental performance of CCBs in large-scale utilization applications to assist in the development of sound, consistent environmental standards for their reuse.
- N2** Project that utilizes fly ash, bottom ash, or wet FGD byproducts at mine sites in an innovative manner that clearly constitutes a beneficial use.
- N3** Project that develops new large-volume utilization markets and/or significantly expands existing but under-used large-volume markets for fly ash and/or bottom ash from pulverized coal boilers (does not include utilization at mine sites).
- N4** Project that develops new large-volume utilization markets and/or significantly expands existing but under-used large-volume markets for wet FGD byproducts (does not include utilization as a feedstock for wallboard manufacture or utilization at mine sites).
- N5** Project that analyzes and clarifies the quantities, costs, benefits, and other market factors that govern decisions by individual CCB producers and users regarding CCB reuse in specific end-use markets.

ANY PRE-PROPOSAL SUBMITTED MUST BE SPECIFIC TO ONLY ONE PARTICULAR REGIONAL RESEARCH PRIORITY AND/OR ONLY ONE PARTICULAR NATIONAL RESEARCH PRIORITY FOR WHICH THAT PRE-PROPOSAL IS TO BE CONSIDERED *REGARDLESS* OF THE PHYSICAL LOCATION OF THE PROJECT OR PROJECT RESEARCHERS.

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THE REGIONAL AND NATIONAL RESEARCH PRIORITIES INDICATED ON THE PRE-PROPOSAL WILL BE WEIGHTED EQUALLY IN THE EVALUATION OF THE PRE-PROPOSAL.

## **CBRC Pre-Proposal Application Checklist**

The Combustion Byproducts Recycling Consortium has developed a pre-proposal application format which is to be followed in preparing your application. The face page form is the last page of this application packet and can be downloaded from the CBRC web site: <http://www.wri.nrcce.wvu.edu/programs/cbrc>. Please include the following sections in your pre-proposal application in the order in which they are listed. Items 1 through 5 must not exceed a total of 6 pages. Use 12 pitch type and 1 inch margins.

### **PRE-PROPOSALS THAT ARE INCOMPLETE AND/OR OVER THE PAGE LIMIT WILL NOT BE CONSIDERED.**

### **PRE-PROPOSALS WITH MORE THAN ONE REGIONAL RESEARCH PRIORITY AND/OR MORE THAN ONE NATIONAL RESEARCH PRIORITY WILL NOT BE CONSIDERED**

- 1) Face Page (form number FP-1, attached)
- 2) Description of Partners (limited to ½ page single-spaced)
- 3) Project Abstract (limit to ½ page single-spaced)
  - a) Include up to one Regional Research Priority (see Regional Research Area Priorities) centered and 2 lines beneath the abstract.
  - b) Include up to one National Research Priority (see National Research Priorities) centered and 3 lines beneath the abstract.
- 4) Impact of Technology (limit to 1 page single-spaced)
- 5) Statement of Work (limit to 3 pages single-spaced)
  - a) Issue Identification
  - b) Objectives
  - c) Background
  - d) Preliminary Studies
  - e) Experimental Procedures/Methodologies
  - f) Work Tasks

The pre-proposal application must be received by the CBRC National Center located at the National Mine Land Reclamation Center at West Virginia University on or before 4:30 PM EST on the due date of **July 31, 2005.**

## **Instructions for Preparing the CBRC Pre-Proposal Application**

Please include the following sections in your pre-proposal application in the order in which they are listed. Note that items 1) through 5) must not exceed a total of 6 pages. Use 12 pitch type and 1 inch margins.

### **PRE-PROPOSALS THAT ARE INCOMPLETE AND/OR ANY PAGES OVER THE PAGE LIMIT WILL NOT BE CONSIDERED.**

- 1) Face Page (form number FP-1, attached): All sections on this form must be completed.
- 2) Description of Partners: This section, limited to ½ page, must include all anticipated partners to be included in this project. Examples include entities such as industry and academia contributing cash and/or in-kind services. Describe who will be participating and the types of contributions they are expected to make to the project.
- 3) Project Abstract: The abstract, limited to ½ page, single-spaced, is to be followed by the preferred regional research area (see Regional Research Area Priorities). The preferred regional research area priority should be spaced 2 lines below the abstract and centered. The preferred national priority (see National Research Priorities) should be spaced 3 lines below the abstract and centered.

### **PRE-PROPOSALS WITH MORE THAN ONE REGIONAL RESEARCH PRIORITY AND/OR MORE THAN ONE NATIONAL RESEARCH PRIORITY WILL NOT BE CONSIDERED**

- 4) Impact of Technology: This section, limited to 1 page single-spaced, should include a description of how the work completed in this project will impact the utilization and technology of coal combustion byproducts.
- 5) Statement of Work:
  - a) Issue Identification - Identify and briefly describe the issue this project is addressing.
  - b) Objectives - List the specific objectives of this project.
  - c) Background - Provide a description of the relevance of the project.
  - d) Preliminary Studies (if applicable) - Describe any precursory research that applies to the project topic and what was determined from those preliminary results.
  - e) Experimental Procedures/Methodologies - Describe any laboratory or field testing to be performed referencing analytical methods used.
  - f) Work Tasks - Break the project into specific work tasks and describe each work task individually.

**Combustion Byproducts Recycling Consortium  
Request for Pre-Proposals 2005 Face Page  
Form FP-1**

Project Title: \_\_\_\_\_

Project Duration (3 year maximum): \_\_\_\_\_ years

Has this pre-proposal been submitted elsewhere? Yes \_\_\_\_\_ No \_\_\_\_\_

If \_\_\_\_\_ yes, \_\_\_\_\_ where \_\_\_\_\_ was \_\_\_\_\_ it \_\_\_\_\_ submitted?

Principal Investigator

Name and Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Funding

Funds requested from CBRC: \_\_\_\_\_

Funds provided by proposer: \_\_\_\_\_

Additional matching funds: \_\_\_\_\_

Total Project Value: \_\_\_\_\_

Proposer's Organization

Name: \_\_\_\_\_

Address: \_\_\_\_\_