



Oak Ridge Associated Universities

Request for Proposals

Alternative Management Methods, Characterization and Environmental Effects of Coal Combustion Products

Background

In 2007, the coal-fueled electric power industry generated almost 72 million tons of fly ash and an additional 55 million tons of other Coal Combustion Products (CCPs)¹. Nationwide, about 40% of CCP production is beneficially used in concrete and cement products, wallboard, highway construction, and other applications. Annually, TVA produces approximately 3 million tons of fly ash, 1.1 million tons of bottom ash and slag, 2.7 million tons of flue gas desulphurization (FGD) gypsum, and 0.2 million tons of other CCPs. About 40% of TVA's CCPs are beneficially reused.

On December 22, 2008 failure of an earthen dike at the Kingston Fossil Plant led to the release of approximately 5.4 million cubic yards of impounded fly ash onto surrounding land and into the adjacent Emory River. This event most directly affected citizens living in close proximity to the plant and TVA but also indirectly impacted all coal burning utilities and other large coal users. For example, as a result of this event, the U.S. Environmental Protection Agency (EPA) directed plant operators and power companies to conduct on-site assessments to determine the structural integrity and vulnerabilities of all ash management facilities and to order repairs where needed.

EPA determined in 1993 and in 2000 that waste from the combustion of coal and other fossil fuels is to be regulated as nonhazardous; however, many organizations, including Congress, are urging EPA to propose new rules regulating coal combustion waste under the Resource Conservation and Recovery Act (RCRA).

Many universities, industry organizations, and companies have conducted research on the commercial use, disposal, and environmental effects of CCPs; however, the Kingston release has focused new attention on all aspects of CCP management. It is TVA's goal that this solicitation will facilitate the scientifically sound development of new beneficial uses for CCPs and the creation of new environmental information that will benefit TVA, the utility industry, regulators, and the public.

¹American Coal Ash Association 2007 CCP Production & Use Survey Results (Revised), <http://www.acaa-usa.org>

Technology Focus Areas of Interest

This funding opportunity will support both scientific research and the development of commercializable processes for two topic areas related to CCPs, their potential uses, storage, and environmental effects of releases into the environment.

Area 1: Coal Combustion Product Management

- Basic research:
 - o chemical and physical properties of CCPs that allow their use as substitutes for conventional raw materials in existing or new manufactured products
 - o alternative management methods including the containment, handling, and processing of CCPs for disposal
- Bench top, pilot, and proof-of-concept demonstrations:
 - o manufacturing processes using CCPs as raw materials
 - o alternative CCP handling and disposal methods

Area 2: Environmental Studies

- Ash stabilization and remediation
- Transport and fate of ash contaminants
- Ash transport and weathering in river sediments
- Ecological effects of ash in waterways
- Bioaccumulation and environmental toxicology of ash contaminants
- Biogeochemistry of selenium
- Ash weathering pathways
- Improved or novel assessment methods
(e.g., Diffusive Thin Film (DTF) techniques for passive bioaccumulation assessment, development of suitable reference substrates for whole sediment toxicity testing, methods for discriminating between ash-derived contaminants and contaminants from other sources)

A second request for proposals for commercialization of new uses of CCPs beyond the pilot stage will be issued at a later date.

Award Information

Support for CCP Management proposals may be in the form of grants, subsidies or TVA in-kind services. The number of investigations supported and total amount of support will depend on the nature and quality of proposals received, the potential for commercial application, and the potential economic or environmental benefit.

Environmental studies funding levels are expected to be \$1 million per year for 3 years, with awards potentially ranging from \$50,000 to \$300,000 or more for 1 to 3 years. The number of awards will depend on the nature of proposals received, but is expected to be at least three and as many as ten.

Eligible Applicants

Eligibility for this funding opportunity is open to colleges and universities, research institutions, private companies, and qualified individual researchers. In making awards, certain exclusions with regard to foreign bidders may be required by law.

How to Apply

To respond to this call for proposals visit <http://www.ornl.gov/flyashresearch>

Pre-proposals and proposals must be submitted electronically through this website. Any proposals received by any other means will not be considered.

Proposal submission deadlines and notification

Pre-proposals will be due on August 31, 2009.

It is anticipated that full proposals, by invitation only, will be due mid to late October and award decisions will be made mid to late December.

Content of Applications

Pre-proposals

A pre-proposal, no longer than 5 pages total, must be submitted in response to this RFP. Following review of pre-proposals, Oak Ridge Associated Universities (ORAU) will invite selected respondents to submit full proposals.

The pre-proposal must contain a cover sheet with:

- ◆ project title
- ◆ name and affiliation of project director/principal investigator(s) (PI) with contact information
- ◆ name and affiliation of Co-PIs or other major participants for collaborative projects
- ◆ total amount of funding requested
- ◆ keywords

The pre-proposal must address:

- ◆ 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)
- ◆ a broad level timeline and budget
- ◆ qualifications and prior experience in this area

Full proposals

Following review of pre-proposals, selected respondents will be invited to submit full proposals.

The full proposal must contain the following sections:

- ◆ cover page
- ◆ abstract/summary (< 1 page)
- ◆ technical proposal (15 pages maximum) describing
 - current state of knowledge or technology in the area of interest
 - project objectives, description, and impacts
 - a detailed timeline, milestones, and work plan (including a sampling plan, if relevant)
 - anticipated outcomes, results, or potential commercial relevance
 - qualifications and prior experience in related work
 - any related work currently ongoing under other support
 - facilities or equipment required or available
 - personnel roles and responsibilities
- ◆ detailed budget with justification (1-2 pages)
- ◆ brief (2 page max.) resumes of key personnel
- ◆ commitment letters from third party collaborators, cost sharers, or financiers

Review process and criteria

- ◆ Pre-proposals will be screened by an independent panel based on criteria below. Submission of full proposals will be by invitation only.
- ◆ Full proposals will be reviewed by external subject matter experts based on criteria below. ORAU will rank proposals based on the experts' reviews and supporting comments. TVA expects to fund technically meritorious proposals based on rank, subject area, and availability of funds. Awards are subject to the availability of funds which may vary by fiscal year.
- ◆ Criteria - technical merit, reasonable timeline, reasonable budget, innovativeness, potential economic and environmental impact, capability/background of PI/Co-PIs, adequate facilities

Other criteria – Cost sharing with other funding sources and collaboration with other researchers is encouraged.

Project deliverables/reporting requirements

- Annual progress reporting for multi-year projects
- Anticipate research projects will produce peer-reviewed articles in scientific journals
- Report patents and patents pending
- Possibility of annual PI's meeting

Questions

Questions must be submitted via email to flyashresearch@orau.org

Upon receipt of this RFP, proposers shall immediately cease contact with TVA technical organizations either onsite or in a corporate office regarding this RFP. Any violation of this direction will be basis for disqualification. Any discussion or questions concerning this RFP shall be directed to the email address identified herein. Any information given to prospective proposers concerning this RFP will be posted to the website for other prospective proposers if ORAU deems that information to be necessary to prospective proposers in submitting proposals or if ORAU determines the lack of it would be prejudicial to any other prospective proposers.