

Environmental Synopsis
Financial Assistance Funding Opportunity Announcement
DE-PS26-04NT42061

Summary: The U.S. Department of Energy (DOE) prepared this Environmental Synopsis pursuant to the Department's responsibilities under section 1021.216 of DOE's National Environmental Policy Act (NEPA) Implementing Procedures set forth in 10 CFR Part 1021. This synopsis summarizes the consideration given to environmental factors and records that the relevant environmental consequences of reasonable alternatives were evaluated in the process of selecting projects seeking financial assistance under Round 2 of the Clean Coal Power Initiative (CCPI), which DOE issued as a Funding Opportunity Announcement (FOA) DE-PS26- 04NT42061 in February 2004. DOE selected four projects as candidates for financial assistance awards during its merit review process. In addition to financial and technical elements, DOE considered relevant environmental factors and consequences of the projects proposed to DOE in response to the FOA. As required by section 1021.216, this synopsis does not contain business, confidential, trade secret or other information that statutes or regulations would prohibit DOE from disclosing. It also does not contain data or other information that may in any way reveal the identity of the offerors.¹

Background: Coal is an abundant and indigenous energy resource and supplies almost 50 percent of the United States' electric power. Demand for electricity is projected to increase by more than 30 percent by 2030. Based on analyses conducted by the EIA, it is projected that this power increase can only be achieved if coal use is also increased. Furthermore, nearly half of the nation's electric power generating infrastructure is more than 30 years old, with a significant portion in service for twice as long. These aging facilities are - or soon will be - in need of substantial refurbishment or replacement. Additional capacity must also be put in service to keep pace with the nation's ever-growing demand for electricity. Therefore, DOE expects that nearly half of the nation's electricity needs will continue to be served by coal for at least the next several decades. Given heightened awareness of environmental stewardship, while at the same time meeting the demand for a reliable and cost-effective electric power supply, it is clearly in the public interest for the nation's energy infrastructure to be upgraded with the latest and most advanced commercially viable technologies to achieve greater efficiencies, environmental performance, and cost-competitiveness. However, to realize acceptance and replication of these advanced technologies into the electric power generation sector,

¹ The four projects selected for awards are identified in this synopsis and information on these projects is available on the DOE National Energy Technology Laboratory web site at <http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/index.html>.

the technologies must first be demonstrated (i.e., designed and constructed to industrial standards and operated at significant scale under industrial conditions).

Public Law 107-63, enacted in November 2001, first provided funding for the CCPI. The CCPI is a multi-year federal program to accelerate the commercial readiness of advanced multipollutant emissions control, combustion, gasification, and efficiency improvement technologies to retrofit or repower existing coal-based power plants and for deployment in new coal-based generating facilities. The CCPI encompasses a broad spectrum of commercial-scale demonstrations that target environmental challenges, including reducing GHG emissions by boosting the efficiency at which coal is converted to electricity or other energy forms. The CCPI is closely linked with DOE's research and development activities directed toward creating ultra-clean, fossil fuel-based energy complexes in the 21st century. When integrated with other DOE initiatives, the CCPI will help the nation successfully commercialize advanced power systems that will produce electricity at greater efficiencies, produce almost no emissions, and create clean fuels. Improving power plant efficiency is a potentially significant way to reduce CO₂ emissions in the near- and midterm. In the longer term, future funding opportunity announcements are expected to target CCPI technologies employing CO₂ capture and storage, or beneficial reuse. Accelerating commercialization of clean coal technologies also positions the United States to supply these technologies to a rapidly expanding world market.

Congress provided for competitively awarded federal cost-shared funding for CCPI demonstration projects. In contrast to other federally funded activities, CCPI projects are not federal projects seeking private investment; instead, they are private projects seeking federal financial assistance. Under the CCPI funding opportunities, industry proposes projects that meet its needs and those of its customers while furthering the national goals and objectives of DOE's CCPI. Demonstration projects selected by the CCPI program become private-public partnerships that satisfy a wide set of industry and government needs. Industry satisfies its short-term need to retrofit or repower a facility or develop new power generating capacity for the benefit of its customers. By providing financial incentives to the energy sector that reduce risks associated with project financing and technical challenges for emerging clean coal technologies, the government: (a) supports the verification of commercial readiness leading toward the long-term objective of transitioning the nation's existing fleet of electric power plants to more efficient, environmentally sound, and cost-competitive facilities; and (b) facilitates the adoption of technologies that can meet more stringent environmental regulation through more efficient power generation, advanced environmental controls, and production of environmentally attractive energy carriers and byproduct utilization.

Applications for demonstrations under CCPI Round 2 were evaluated against specific programmatic criteria:

- **Technical Merit**—Scientific and engineering approach, data and other evidence to support technology claims, readiness of the technology, and potential benefits such as improved system performance, reliability, environmental performance, and costs.
- **Feasibility**—Appropriateness of proposed site(s), including availability and access to water, power transmission, coal transportation, facilities and equipment infrastructure, and permits; ability of the proposed project team to successfully implement the project; and soundness and completeness of the statement of work, schedule, test plan, milestones, and decision points.
- **Commercialization Potential**—Commercial viability relative to the scale of the project, potential for broad market impact and widespread deployment, and soundness of the commercialization plan, including experience of the project team.
- **Adequacy of the Financial and Business Plan**—Financial condition and capability of proposed funding sources, priority placed by management on financing the project, and adequacy of the applicant's financial management system.
- **Adequacy of the Repayment Plan**—Ability to repay the government's cost share.

DOE selects projects for CCPI funding in a series of rounds, each of which starts with a FOA that asks project proponents to submit applications for federal cost-sharing for their demonstration projects. DOE issued the first CCPI FOA (Round 1) in March 2002. It issued a second FOA (Round 2) in February 2004. These funding opportunities focused on projects involving advanced coal-based power generation, including gasification, efficiency improvements, optimization through neural networking, environmental and economic improvements, and mercury control.

As a Federal agency, DOE must comply with NEPA (42 U.S.C. §§ 4321 et seq.) by considering potential environmental issues associated with its actions prior to deciding whether to undertake these actions. The environmental review of applications received in response to the CCPI Round 2 FOA was conducted pursuant to Council on Environmental Quality Regulations (40 Code of Federal Regulations (CFR) Parts 1500 - 1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021), which provide directions specific to procurement actions that DOE may undertake or fund before completing the NEPA process.

DOE's Purpose and Need: The purpose and need of DOE's selections of projects under the CCPI Program are to satisfy the responsibility Congress imposed on the Department to demonstrate advanced coal-based technologies that can generate clean, reliable, and affordable electricity in the United States.

The specific objectives of the Round 2 FOA were:

- Demonstrate advanced coal-based technologies that have progressed beyond the research and development stage to a point of readiness for operation at a scale that can be readily replicated in commercial practice within the electric power industry.
- Accelerate the likelihood of deploying the demonstrated technologies for widespread commercial use within the electric power sector.

The FOA also identified two technology priorities for CCPI Round 2: gasification-based power generation systems and mercury control technology.

Reasonable alternatives available to DOE: DOE received thirteen applications in response to the CCPI Round 2 FOA. Applications were screened to determine whether they met the basic eligibility requirements that are defined by the program. Two of the proposals were disqualified in this initial screening. The remaining eleven applications covered a wide variety of technology alternatives in locations throughout the United States. The eleven applications were evaluated against technical, financial and environmental factors. The technical and financial evaluations resulted in separate numeric scores; the environmental evaluation, while not scored, was considered in making selections. Each applicant was required to complete and submit a standard environmental questionnaire for each site proposed in its application.

The evaluations focused on the technical description of the proposed project, financial plans and budgets, potential environmental impacts, and other information that the applicants submitted. Following reviews by technical, environmental and financial panels and a comprehensive assessment by a merit review board, a DOE official selected those projects that best met the CCPI program's purpose and need. By broadly soliciting proposals to meet the programmatic purpose and need for DOE action and by evaluating the potential environmental impacts associated with each proposal before selecting projects, DOE considered a reasonable range of alternatives for meeting the purpose and need of the CCPI Round 2 solicitation.

The applications proposed the following technologies: low-rank coal drying and upgrading, integrated gasification combined cycle (IGCC); gasification combined with other technologies (e.g., fuel cells, cogeneration, synthesis gas for industrial use, fluidized bed combustion, or liquid fuels production); and advanced multi-pollutant emission control through advanced combustion, optimization software, or control technology integration.

Environmental factors considered and relevant environmental consequences

identified: DOE assembled an environmental review team to assess the applications in the competitive range. The review team considered all resource areas that could potentially be affected. These resources areas are aesthetics, air quality, climate, biological resources, surface water, floodplains, wetlands, geology, groundwater, health and safety, land use, soils, noise, community services, socioeconomics, environmental justice, traffic and transportation, utilities, and cultural resources.

In conducting the environmental review, the review team considered the information provided as part of each application, which included narrative text, worksheets, and the responses to the environmental questionnaire submitted by the applicant. In addition, reviewers independently verified the information provided to the extent practicable using available sources commonly used in the preparation of NEPA documents, and conducted preliminary analysis to identify the potential range of impacts that would be associated with each application. Reviewers identified both direct and indirect potential impacts to the resource areas mentioned above as well as short-term and long-term impacts. The reviewers also considered any mitigation proposed by the applicant and any reasonably available mitigation that may not have been proposed.

The following impacts, summarized by resource area, could be expected and were considered in the selection of applications for award:

Aesthetics – No impacts would be expected for the seven projects proposed at existing facilities. Low to moderate impacts would be expected for the other projects involving construction of new facilities.

Air quality – All of the projects would have lower emissions of air pollutants than conventional technologies. For five of the seven projects at existing facilities, lower emissions would have resulted from the project. The other projects would introduce new sources of air emissions, but all of these projects probably would have been able to obtain needed permits for these emissions. Low to moderate impacts were expected from all projects involving construction activities.

Climate – Carbon capture and sequestration was not an objective of this round of CCPI projects. However, all the projects would have demonstrated technologies with improved energy efficiency, thereby resulting in reduced emissions of greenhouse gases. In addition, five of the projects would have reduced greenhouse gas emissions during the demonstration phase through repowering or optimization of existing facilities. Two of the projects would have generated a concentrated stream of carbon dioxide and could have incorporated carbon sequestration in the future.

Biological resources – None of the projects were expected to impact threatened or endangered species, critical or crucial habitat, migratory bird flyways, or wildlife refuges. Low to moderate potential impacts to biological resources in general were expected.

Surface water – For projects other than the two that involved new controls for process optimization only, increased water use was expected, as well as new discharges to surface waters. Two of the proposed projects were for existing facilities that had minor permit violations in the past. No permitting issues were expected for any of the projects. Sediment control during construction would have been necessary.

Floodplains – No impacts were expected for any of the proposed projects.

Wetlands – One of the projects proposed at an undeveloped site identified 9.5 acres of wetlands that could have been impacted. No wetlands impacts were identified as to any of the other projects, but the four projects proposed at undeveloped sites had the potential for wetland impacts due to construction at the project site or along linear facilities (e.g. transmission lines, pipelines, or roads).

Geology – None of the proposed projects was expected to have the potential for impacts to geologic resources.

Ground water – No impacts were identified for any of the proposed projects.

Human health and safety – Potential impacts would have been low to moderate and would have consisted mainly of hazards associated with construction. The level of risk was generally related to the size and complexity of the planned construction. One project would have generated a hydrogen stream with its associated hazards. Another project would have generated anhydrous ammonia that would have been stored on-site and transported with the risks associated with ammonia spills. The two projects that would have generated concentrated CO₂ streams would have introduced asphyxiation hazards associated with releases of CO₂.

Land use – No impacts were identified for applications at existing facilities where the proposed project would not have increased the footprint of the existing plant. Low to moderate impacts were anticipated for applications proposing new construction. The level of potential impacts would have been generally higher for new facilities on land currently used for other than industrial purposes.

Soils – No impacts were expected for the two projects involving process optimization. Low impacts related to increased erosion during construction were anticipated for the other projects.

Noise –Low to moderate impacts were expected from increased ambient noise for all projects that involve new construction. Moderate impacts were expected for the four projects at undeveloped sites.

Community services – No impacts were expected for the projects involving process optimization. Low impacts were expected for the seven projects at existing facilities. Low to moderate impacts were expected for the remaining projects. Generally, projects anticipating a larger temporary workforce during construction were expected to place a higher demand on community services – particularly in smaller, more rural communities where currently existing community services are more limited.

Socioeconomics – Expected impacts were low for all applications. All projects would have provided some additional employment during construction and operations. Most employment opportunities would have been in the vicinity of the proposed projects.

Environmental justice – No impacts were identified for any of the proposed projects.

Transportation and traffic – No impacts were expected for the projects involving process optimization. Low to moderate impacts to traffic flow were expected for all other projects. Impacts would have been highest during construction. Lower impacts were anticipated during operations. Projects in more rural areas would generally have had lower impacts than those in more urban areas, where some increases in travel time could be expected during periods of peak construction.

Utilities – Low to moderate impacts were expected for all applications. Expected impacts would have been higher for new plants proposed at undeveloped sites.

Cultural resources – One proposal identified historic preservation sites that its project could have affected. However, all projects that involve new ground disturbance have the potential for impacts to cultural resources. Low impacts were expected for construction at existing facilities and consultation with the state historic preservation office would have been necessary. For projects at undeveloped sites, the potential for impacts would be greater.

Conclusion: The applications received in response to the FOA for CCPI Round 2 provided reasonable alternatives for accomplishing DOE’s purpose and need to satisfy

the responsibility Congress imposed on DOE to demonstrate advanced coal-based technologies that can generate clean, reliable, and affordable electricity in the United States. An environmental review was part of the evaluation process of these applications. DOE prepared a critique containing information from this environmental review. This critique, summarized here, contained summary as well as project-specific environmental information. The critique was made available to – and considered by – the selection official before selections for financial assistance were made. DOE determined that selecting four applications would satisfy its purpose and need. DOE anticipated that it would need to prepare additional NEPA documentation for each of the applications selected in order to more fully analyze the potential environmental impacts for those projects. DOE prepared environmental impact statements for two of these projects: the Mesaba Energy Project (DOE/EIS-0382) proposed by Excelsior Energy and the Demonstration of a Coal-Based Transport Gasifier Project (DOE/EIS-0383; DOE/EIS-0409).² proposed by Southern Company Services. A categorical exclusion was completed for the Mercury Species and Multi-Pollutant Control Project proposed by Pegasus Technologies. The Airborne ProcessTM Commercial Scale Demonstration Project proposed by Mustang Clean Energy was withdrawn by mutual consent of the participant and DOE.

² EIS-0383 was completed for the project at a site in Orlando, Florida. This site became unavailable for the project and EIS-0409 was completed for the project relocated to a site in Kemper County, Mississippi.