

Clean Coal Power Initiative

Funding Schedule by Activity

	(dollars in thousands)				
	FY 2003	FY 2004	FY 2005	\$ Change	% Change
Clean Coal Power Initiative					
Clean Coal Power Initiative/FutureGen	145,116	169,881	287,000	+117,119	+68.9%
FutureGen ¹	0	8,889	(237,000)	(+228,111)	(+2566%)
Total, Clean Coal Power Initiative.....	145,116	178,770	287,000	+108,230	+60.5%

Description

The mission of the Clean Coal Power Initiative (CCPI) is to enable and accelerate deployment of advanced technologies to ensure that the United States has clean, reliable, and affordable electricity. The CCPI is a cost-shared partnership between the government and industry to research, develop and demonstrate advanced coal-based power generation technologies (the most advanced example of which will be FutureGen). The mission of the FutureGen project is to establish the capability and feasibility of co-producing electricity and hydrogen from coal with essentially zero emissions, including carbon (sequestration).

Benefits

The Clean Coal Power Initiative subprogram will develop advanced coal-based power generation technologies that: improve efficiency from 2002 baseline by 40-50 percent by 2010, with environmental and economic performance capable of achieving 90 percent Hg removal at a cost of 70 percent of current technology by 2010, 0.15 lb/MMBtu NO_x at 75 percent of the cost of current technology (selective catalytic reactors), and lower capital costs for gasification technologies from \$1200 per kilowatt of capacity; co-produce heat, fuels, chemicals or other useful byproducts; and, provide a deployment-ready suite of advanced technologies that can produce substantial near-, mid-, and long-range economic and environmental public benefits. The CCPI subprogram will create public/private partnerships to provide technology to ensure continued electricity production from the extensive U.S. fossil fuel resource, including control technologies to permit reasonable-cost compliance with emerging regulations, and ultimately, by 2015, zero emission plants (including carbon) that are fuel-flexible, and capable of multi-product output and efficiencies over 60 percent with coal.

In FY 2005, the administration is requesting \$237 million for the FutureGen project to establish the capability and feasibility of co-producing electricity and hydrogen from coal with essentially zero emissions. The project is critical to the continued and expanded use of our most abundant and lowest cost domestic energy resource, coal. FutureGen will require integration of components yet to be developed, such as low cost CO₂ capture and storage technology, and thus involves considerable risk.

¹ Funding for FutureGen was appropriated separately in FY 2004. The FY 2005 Budget includes FutureGen under the Clean Coal Power Initiative.

However, the public benefits when we succeed will be enormous. In order to assure that FutureGen is successful, it will be supported by a clean coal R&D effort focused on all the key technologies needed - such as carbon sequestration, membrane technologies for oxygen and hydrogen separation, advanced turbines, fuel cells, coal to hydrogen conversion, gasifier related technologies, and other technologies, funding for which is included in the Administrations FY 2005 budget request. CCPI demonstrations directly support the FutureGen project by driving down the costs of IGCC systems and other technologies whose extensions are critical to the success of FutureGen.

Coal is the most abundant U.S. energy resource, with domestic reserves exceeding the energy potential of the world's oil reserves. About 90% of all coal produced in the U.S. is used for electricity generation, and over half of our Nation's electricity is produced by coal-fired power plants. Meeting our Nation's rising demands for clean, reliable, and affordable electricity will require the use of coal for the foreseeable future. We must therefore develop and demonstrate technologies that will enable the continued use of coal to meet our growing demand for electricity in an environmentally sound manner.

The Bush Administration is advancing its new vision in clean coal research. The Clean Coal Power Initiative (CCPI) is an effort within the Department of Energy's Fossil Energy program that combines industry investments in research and development with federal matching funds for research, development and demonstration of advanced technologies on coal-fired power plants. The Administration is requesting \$50 million in FY 2005 to fund joint government-industry-funded projects on new technologies that can enhance the reliability, efficiency, and environmental performance of coal-fired power generators. This FY 2005 funding will support the second round of projects under the Clean Coal Power Initiative, incorporating the latest advances in clean coal technologies. The CCPI responds to the National Energy Policy call to address the reliability and affordability of the Nation's electricity supply, particularly from its coal based generation, and is a key component of the President's commitment to research and development of clean coal technologies to meet this challenge. By enabling advanced technology to overcome technical risks and bringing them to the point of commercial readiness, the CCPI facilitates the movement of technologies into the market place that are emerging from the core research and development activities and directly responds to President's Clear Skies Initiative and Global Climate Change Initiative to reduce emissions of air pollutants (particularly NO_x and mercury) and carbon dioxide.

In FY 2003, the first round of CCPI projects commenced and NEPA was initiated including the conduct of public scoping meetings for three of the projects that will require Environmental Impact Statements. NEPA was completed for four of six Power Plant Improvement Initiative (PPII) projects and those projects are under construction or in operation. In FY 2004, the CCPI projects selected in the first round will be underway and sufficient CCPI funding exists to support a solicitation for a second round of projects. FY 2005 funding will enable the second round of CCPI projects to be awarded.

Detailed Program Justification

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
▪ Clean Coal Power Initiative/FutureGen	143,626	168,181	284,130

For FY 2005, in support of the President’s Coal Research Initiative, continue the Clean Coal Power Initiative (CCPI) to research, develop, and bring to commercial readiness advanced clean coal-based technologies that enhance electricity reliability, increase generation capacity, and provide clean, affordable power. Provide additional funding, complete evaluation of project applications and make project selections, and initiate negotiations with the second round of projects under the CCPI. For projects selected under the first solicitation, initiate operation for two projects, Neuco’s plant-wide optimization system employing neural networks and the TOXECON sorbent injection system project for multi-pollutant control. Great River Energy will continue operation and four additional projects will initiate or continue construction activities. *Participants include: University of Kentucky Research Foundation, Neuco, Inc., Great River Energy, Western Greenbrier Co-Generation, LLC, Waste Management Processors Inc., PTY, LLC, Colorado Springs Utilities, and Wisconsin Electric Power Company. Additional participants will be determined based on results of the second competitive solicitation.*

For FY 2005, under the FutureGen project, NEPA activities will continue. Permitting activities will be initiated during FY2005 and must be completed before start of construction. Ordinarily, only a few permits (e.g., air, water, construction) require long lead times and/or public hearings. However, a large project such as FutureGen will require many state and local permits, and their issuance will therefore be staggered between FY 2005 and FY 2006. Site monitoring and characterization will be initiated during FY 2005. Information gleaned from design/engineering studies will be incorporated into detailed design activities, as appropriate. Typically, baseline environmental monitoring data must be gathered to support not only NEPA and Permitting activities, but also Design/Engineering. Candidate technologies will be considered and evaluated. Options will be considered in terms of success potential and leading edge characteristics. Preliminary design activity will include conceptual design of the plant’s power train, air separation units, turbine and steam cycles and other generic balance of plant auxiliary systems. *Participants include:TBD.*

For FY 2005, within the Power Plant Improvement Initiative (PPII) program, complete four of six active projects including: Tampa Electric’s Neural Network-Sootblower Optimization project; Sunflower Electric’s optimized control system project; Universal Aggregates’ ash utilization project; and Otter Tails’ advanced particulate collector demonstration. Initiate operation for CONSOL Energy’s multi-pollutant Circulating Dry Scrubber system and TIAX’s advanced hybrid system for NO_x control. *Participants include: Otter Tail Power Corp. with UNDEERC and W. L. Gore & Associates, Tampa Electric Co., Universal Aggregates, LLC, Sunflower Electric Power Corp., CONSOL Energy, Inc., and TIAX, LLC.*

For FY 2004, within the Clean Coal Power Initiative (CCPI) program, provide funding to support issuing a second solicitation leading to expanding the portfolio of demonstration projects. Award

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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remaining projects from the first solicitation and begin operation of Great River Energy’s coal-dryer system for high-moisture lignite and Powder River Basin (PRB) coals. Complete National Environmental Policy Act (NEPA) requirements and initiate construction activities for four projects and continue design activities for three projects. *Participants included: University of Kentucky Research Foundation, Neuco, Inc., Great River Energy, Western Greenbrier Co-Generation, LLC, LG&E Energy Corp; Waste Management Processors, Inc., PTY, LLC, Colorado Springs Utilities, and Wisconsin Electric Power Company.*

For FY 2004, within the Power Plant Improvement Initiative (PPII) program, initiate operation for Tampa Electric’s Neural Network-Sootblower Optimization project; Sunflower Electric’s optimized control systems project; and Universal Aggregates’ ash utilization project to produce lightweight aggregate. Continue demonstration testing of the Advanced Hybrid Particulate Collector at Otter Tail Power’s Big Stone Station. Complete National Environmental Policy Act (NEPA) activities and initiate construction of CONSOL Energy’s multi-pollutant Circulating Dry Scrubber system and TIAX’s advanced hybrid system for NO_x control. *Participants include: Otter Tail Power Corp. with UNDEERC and W. L. Gore & Associates, Tampa Electric Co., Universal Aggregates, LLC, Sunflower Electric Power Corp., CONSOL Energy, Inc., and TIAX, LLC.*

For FY 2003, initiated negotiation activities for eight project selections from the first CCPI solicitation. One project withdrew from negotiations. Initiated NEPA activities on all projects including conduct of the public scoping meetings for the three projects will be require the preparation of Environmental Impact Statements. Began planning activities for the second solicitation. *Participants included: University of Kentucky Research Foundation, Neuco., Inc., Great River Energy, Western Greenbrier Co-Generation, LLC, LG&E Energy Corp; Waste Management Processors, Inc., PTY, LLC, Colorado Springs Utilities, and Wisconsin Electric Power Company.*

For FY 2003, within the Power Plant Improvement Initiative (PPII) program, awarded Cooperative Agreements for two projects, bringing the total awarded to four out of six active projects. National Environmental Policy Act (NEPA) activities were completed for all awarded projects. Began test operations on the Advanced Hybrid Particulate Collector, installed sensor equipment for the Sunflower combustor optimization project, and installed advanced soot-blowing equipment for the Tampa Electric project. Initiated construction of the processing facility for the Universal Aggregates project that will convert spray-dryer ash into lightweight aggregate for masonry or concrete. *Participants include: Otter Tail Power Corp. with UNDEERC and W. L. Gore & Associates, Tampa Electric Co., Universal Aggregates, LLC, Sunflower Electric Power Corp., CONSOL Energy, Inc., and TIAX, LLC.*

▪ **FutureGen** 0 8,889 (237,000)

For FY 2005, activities will continue under the Clean Coal Power Initiative described above.

For FY 2004, the NEPA process will be initiated along with the conceptual plant design. Assessments of the availability of key cutting edge technologies will be conducted. Analyses will be conducted to establish critical site requirements. Detailed project schedules and

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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competitive procurement plans for key components and technologies will be developed.

Participants include:TBD.

▪ Program Support	1,452	1,700	2,870
Fund technical and program management support.			
Total, Clean Coal Power Initiative	145,116	178,770	287,000

Explanation of Funding Changes

FY 2005 vs. FY 2004 (\$000)

Clean Coal Power Initiative/FutureGen

- Increase in the Clean Coal Power Initiative/FutureGen program will create a public/private partnership to prove out technology ultimately leading to zero emission plants..... +115,949

FutureGen

- FY 2004 activity will continue in the CCPI/FutureGen account..... -8,889

Program Support

+1,170

Total Funding Change, Clean Coal Power Initiative	+108,230
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