

Office of Fossil Energy

FY 2009 Budget Request

James A. Slutz

Acting Principal Deputy Assistant Secretary
February 4, 2008



TAPPING THE FULL POTENTIAL OF AMERICA'S TRADITIONAL ENERGY RESOURCES

Fossil Energy Research & Development

The mission of the Fossil Energy Research and Development program is to create public benefits by enhancing U.S. economic, environmental, and energy security.

Achieving this mission involves developing technological capabilities to dramatically reduce carbon emissions to achieve near-zero atmospheric emissions power production.



Meeting the President's Priorities:

Climate Change

Low-cost carbon sequestration to expand climate change options

Higher-efficiency power plants (IGCC & fuel cells) to reduce carbon dioxide emissions

“Near-Zero Emissions Power Plants” (*FutureGen*) that link high-efficiencies with carbon sequestration

Energy & Economic Security

Strategic Petroleum Reserve/ and **Northeast Home Heating Oil Reserve** at full readiness

Hydrogen from coal to expedite the transition to the “hydrogen economy”



Realizing the Promise of Clean Coal

A Commitment to Clean, Affordable Power from America's Most Abundant Energy Resource

Coal Technology Program **FY 2009 Request: \$647.5 Million**

Includes FutureGen, Clean Coal Power Initiative, Carbon Sequestration, Other Supporting R&D Programs, Hydrogen from Coal, and Fuel Cells R&D

Distribution of funds varies from FY 2008 to achieve maximum program benefit in a disciplined budget environment



Realizing the Promise of Clean Coal

FutureGen **FY 2009 Request: \$156 Million**

FutureGen promotes advanced, full-scale integration of integrated gasification combined cycle and CCS technology to produce electric power from coal, while capturing and sequestering carbon dioxide resulting in near-zero atmospheric emissions coal energy systems

- ✓ **FutureGen** is being restructured to accelerate the commercial use of near-zero emissions clean coal technologies
 - New approach proposes multiple 300-600 Megawatt (MW) commercial-scale demonstration clean coal power plants – as opposed to a single, 275 MW R&D facility - each producing electricity and capturing and safely sequestering an estimated one million metric tons of CO₂ annually



Realizing the Promise of Clean Coal

Clean Coal Power Initiative **FY 2009 Request: \$85 Million**

The **Clean Coal Power Initiative (CCPI)** is a cooperative, cost-shared program between the government and industry to rapidly demonstrate emerging technologies in coal-based power generation to help accelerate their commercialization

- ✓ **Round 2:** Competitive solicitation completed
- ✓ **Round 3:** Competition planned for FY 2008. Completion of Round 3 solicitation, proposal evaluations and project selections will occur in FY 2009



Realizing the Promise of Clean Coal

Fuels and Power Systems Program FY 2009 Request: \$406.5 Million

✓ Includes technology developed for advanced systems and near-zero emission plants (e.g., FutureGen)

- Carbon Sequestration
- Fuels (Hydrogen from Coal)
- Fuel Cells
- IGCC (Integrated Gasification Combined Cycle)
- Advanced Turbines
- Advanced Research
- Innovations for Existing Plants



Realizing the Promise of Clean Coal

Providing New Options to Meet the Challenge of
Climate Change

Carbon Sequestration **FY 2009 Request: \$149.1 Million**

- ✓ **Core Program:** Increasing emphasis on carbon capture & storage
 - CO₂ pre combustion capture technology R&D
 - CO₂ storage (focus on geologic storage)
 - Measurement, monitoring and verification technology R&D
 - Non-CO₂ greenhouse (methane from mine/landfills)
 - Breakthrough concepts in support of core program technologies



Realizing the Promise of Clean Coal

Carbon Sequestration (cont'd)

- ✓ **Regional Partnerships:** National network of partnerships; cooperative effort of DOE, states, universities, and industry to identify and plan for sequestration approaches most suited to a region

FY 2009 Activities: Will continue development activities associated with Phase III large-scale field tests; will continue Phase II field validation tests involving CO₂ injection and monitoring, mitigation, and verification operations in saline reservoirs, depleted oil and gas fields, and coalbed methane seams, basalts; support of Carbon Sequestration Leadership Forum (CSLF) and FutureGen



Realizing the Promise of Clean Coal

Carbon Sequestration (cont'd)

- ✓ **Carbon Sequestration Leadership Forum:** The CSLF is an ambitious international effort to advance carbon capture and storage technology as a way to reduce greenhouse gas emissions

The Forum constructively engages the world's major users and producers of fossil energy in collaborative activities to address carbon dioxide emissions

The CSLF is currently comprised of 22 members, including 21 countries and the European Commission



Realizing the Promise of Clean Coal

Other Supporting Coal R&D

FY 2009 Request: \$163.6 Million

- ✓ **Advanced Power Systems (\$97 Million):** Advanced, high efficiency systems for emission-free power plants
 - IGCC (Integrated Gasification Combined Cycle) (\$69 million)
 - Advanced Turbines (principally for IGCC applications) (\$28 million)
- ✓ **Innovations for Existing Plants (\$40 Million):** CO₂ emissions reductions from the existing coal power plants
- ✓ **Advanced Research (\$26.6 Million):** University research, new materials, computational technologies, etc.



Realizing the Promise of Clean Coal

Fuel Cells

FY 2009 Request: \$60.0 Million

- ✓ **Focus is on reducing costs of fuel cells for distributed power**

FY 2009 Priority: Continue the successful and highly promising work of the Solid State Energy Conversion Alliance (SECA) to develop ultra-low cost (\$400 per kilowatt) fuel cells



Hydrogen Fuels

Producing Tomorrow's Clean Fuels in a Coordinated Effort with the Offices of Energy Efficiency, Nuclear Energy, and the Dept. of Transportation

Hydrogen-from-Coal

FY 2009 Request: \$10 Million

✓ **Coal fuels research for hydrogen production**

FY 2009 Plan: Continue establishing feasibility of coal-to-hydrogen technologies, and scale-up of advanced H₂/CO₂ separation



Oil and Gas Activities

Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Program

- ✓ **Established by the Energy Policy Act of 2005:** Research, development and demonstration of technologies in ultra-deepwater resources, unconventional natural gas, other petroleum resources

(DOE implemented the program in FY 2007 and FY 2008, but will propose in FY 2009 to repeal this program through future legislation)

Alaska Natural Gas Pipeline

- ✓ **Office of Fossil Energy:** will continue implementing the \$18 billion Loan Guarantee Program although no funds are requested in FY 2009



Oil and Gas Activities (cont'd)

Import and Export of Natural Gas

- ✓ **Authorizations:** The Natural Gas Act of 1938, as amended, requires an authorization to market, trade, or use foreign natural gas or to export domestic gas to another country
- ✓ **Monthly Reporting:** Natural gas trade including LNG

Rocky Mountain Oilfield Testing Center

- ✓ **Conduct Field Testing on Promising Technologies:** Co-located with NPR-3. Provides opportunities for field-testing and demonstration of upstream oil and gas technologies, environmental products, and energy efficient, geothermal and other renewable technologies as they relate to oil and gas operations



Maintaining America's Energy Security

Strategic Petroleum Reserve FY 2009 request: \$344.0 Million

✓ **Maintaining America's Petroleum Stockpile**

Facilities Operations and Readiness: \$172.6 Million*

Facilities Expansion to 1.0 billion barrels: \$171.4 Million

(Expansion of 2 Existing Sites and Development of a New Site at Richton, MS)

Expansion to 1.5 Billion essential to maintaining U.S. Energy Security

Northeast Home Heating Oil Reserve FY 2009 Request: \$9.8 Million

✓ **Ready to Respond to Fuel Oil Emergencies in the Northeast**

Established in 2000 as "Emergency Stockpile" which can respond rapidly to Winter Related Shortages of Heating Oil

Currently 1.965 million barrels of Heating Oil in commercial terminals



Naval Petroleum and Oil Shale Reserves

FY 2009 Request: \$19.1 Million

Continue to operate NPR-3/ RMOTC in Wyoming and NPR-1 (CA) closeout work

Fossil Energy Budget

		FY2009 Request (Dollars in Thousands)
President's Coal Research Initiative		
Research and Development	Clean Coal Power Initiative	\$85,000
	FutureGen	156,000
	Fuels and Power Systems	
	Sequestration	149,132
	Other Supporting Coal R&D	163,600
	Coal-to-Hydrogen	10,000
	Fuel Cells	60,000
	Coal Research - NETL	23,780
	Total Fuels & Power Systems	406,512
	Total Coal	647,512
	Natural Gas	\$0
	Oil Technology	\$0
	Other R&D/Prog. Direction/Mgmt.Support	\$117,828
	Use of Prior year balances	(-\$11,310)
	Total, Research and Development	\$754,030
Petroleum Reserves	Strategic Petroleum Reserve – Facilities Development	\$172,600*
	Strategic Petroleum Reserve – Facilities Expansion	171,400
	Home Heating Oil Reserve	9,800
	Naval Petroleum Reserves/RMOTC	19,099
	Total, Petroleum Reserves	\$372,899
Total Fossil Energy Budget		\$1,126,929

**For More Information:
www.fossil.energy.gov**



TAPPING THE FULL POTENTIAL OF AMERICA'S TRADITIONAL ENERGY RESOURCES