Fossil Energy Research and Development

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Fossil Energy Research and Development
Proposed Appropriation Language

For necessary expenses in carrying out fossil energy research and development activities, under the authority of the Department of Energy Organization Act (Public Law 95-91), including the acquisition of interest, including defeasible and equitable interests in any real property or any facility or for plant or facility acquisition or expansion, and for conducting inquiries, technological investigations and research concerning the extraction, processing, use, and disposal of mineral substances without objectionable social and environmental costs (30 U.S.C. 3, 1602, and 1603), $420,575,000, to remain available until expended: Provided, That $115,753,000 shall be available until September 30, 2015 for program direction: Provided further, That for all programs funded under Fossil Energy appropriations in this Act or any other Act, the Secretary may vest fee title or other property interests acquired under projects in any entity, including the United States

Explanation of Changes

No changes.

Fossil Energy
Office of Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Fossil Energy Research and Development			
Coal	359,320	370,650	276,631
Natural Gas Technologies	14,575	15,083	17,000
Unconventional Fossil Energy Technologies	4,859	5,027	0
Program Direction	119,929	120,663	115,753
Plant & Capital Equipment	16,794	16,897	13,294
FE Environmental Restoration	7,897	7,945	5,897
Special Recruitment Programs	700	704	700
Subtotal, Fossil Energy Research and Development	524,074	536,969	429,275
Rescission of Prior Year Balances	-187,000	-42,000	0
Use of Prior Year Balances	0	0	-8,700
Total, Fossil Energy Research and Development	**337,074**	**494,969**	**420,575**
Strategic Petroleum Reserve	**192,704**	**193,883**	**189,400**
Northeast Home Heating Oil Reserve	**10,119**	**10,181**	**8,000**
Elk Hills School Land Fund	**0**	**0**	**0**
Naval Petroleum and Oil Shale Reserves	**14,909**	**15,000**	**20,000**
Total, Fossil Energy	**554,806**	**714,033**	**637,975**

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

*SBIR/STTR:

- FY 2012 Transferred: SBIR: $8,486; STTR: $1,142
- FY 2013 Annualized CR: SBIR $9,020: STTR: $1,161
- FY 2014 Request: SBIR $6,082: STTR: $869

Office Overview and Accomplishments

The Office of Fossil Energy (FE) advances technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels which are essential to our Nation's security and economic prosperity. FE leads Federal research, development, and demonstration efforts on advanced carbon capture, and storage (CCS) technologies to facilitate achievement of the President's climate goals. FE also develops technological solutions for the prudent and sustainable development of our unconventional domestic resources. These Fossil Energy Research and Development (FER&D) programs create public benefits by 1) performing and managing research that reduces market barriers to the environmentally sound use of fossil fuels, 2) partnering with industry and others to advance fossil energy technologies toward commercialization, and 3) supporting the development of information and policy options that benefit the public.

In addition to R&D, FE also manages the Strategic Petroleum Reserve (SPR), the SPR Petroleum Account, the Northeast Home Heating Oil Reserve (NEHHOR), and the Naval Petroleum and Oil Shale Reserves (NPOSR). The SPR provides strategic and economic security against foreign and domestic disruptions in U.S. oil supplies via an emergency stockpile of crude oil. The program fulfills U.S. obligations under the International Energy Program, which avails the U.S. of International Energy Agency (IEA) assistance through its coordinated energy emergency response plans, and provides a deterrent against energy supply disruptions. The SPR Petroleum Account funds all SPR petroleum inventory acquisitions, associated transportation costs, U.S. Customs duties, terminal throughput charges and other related miscellaneous costs. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. NEHHOR provides a short-term emergency supplement to the Northeast systems' commercial supply of heating oil in the event of a supply interruption. NPOSR continues to close out legal responsibilities of environmental remediation at Naval Petroleum Reserves No. 1 (NPR-1) and disposition activities, including environmental remediation, at Naval Petroleum Reserves No. 3 (NPR-3).

In FY 2012 FE achieved significant accomplishments in program management and program development.

Accomplishments include:

FER&D: Three CCS demonstration projects initiated or substantially advanced their construction efforts while five other projects either completed or progressed toward their front-end engineering design; which also included providing updated capital cost estimates and signing critical, project-related agreements. The Natural Gas Technology Program conducted research to understand and minimize the potential environmental, health, and safety impacts of shale gas development. The Program successfully completed a 30 day production test of an arctic well in 2012 providing large volumes of data available to the public for further evaluation.

SPR: The SPR maintained an emergency petroleum stockpile to protect the Nation's Energy Security.

Alignment to Strategic Plan

The Department's May 2011 Strategic Plan articulates DOE's first goal to catalyze the timely, material, and efficient transformation of the Nation's energy system and secure U.S. leadership in clean energy technologies.

FE's R&D mission supports achievement of this DOE goal, and FE is accountable for the following targeted outcome identified in the Strategic Plan:

- Bring at least five commercial-scale carbon capture and storage (CCS) demonstrations online by 2016.

These demonstrations focus on first generation CCS technologies and seek to demonstrate that CCS can be integrated at commercial scale while maintaining reliable, predictable and safe plant operations. However, in the case of electricity generation, first generation CCS technology cost is not expected to be low enough to achieve widespread deployment in the near term.

Current R&D on second generation technology indicates, through engineering and systems analyses studies, 90 percent CO_2 capture from Advanced Energy Systems equipped with pre-, post-, and oxycombustion technology with the potential for no more than \$40/tonne CO_2 captured. More advanced, transformational technology could achieve below \$10/tonne CO_2 captured. These figures are in constant dollars (USD2011).

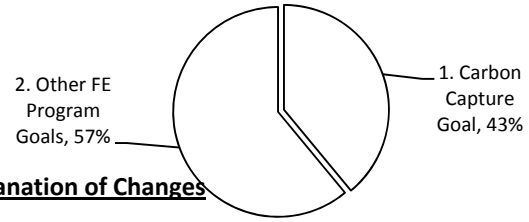
FER&D efforts are fully aligned with the DOE Strategic Plan to enable prudent development of our natural resources, accelerate energy innovation through precompetitive R&D, leverage domestic and international partnerships, and help to sustain a world-leading technical workforce.

Under the Department's Strategic Goal, *Transform Our Energy Systems*, the SPR provides an emergency stockpile of petroleum to protect the United States against petroleum supply disruptions by domestic and international events.

In order to achieve these targeted outcomes and support the overall DOE mission and goals, FE has established the following FE Programmatic Goals:

- Enable commercial baseload CCS deployment of 1st generation technologies in the 2020 timeframe, based on engineering scale-up and operational experience from the demonstration scale projects brought online in the 2016 time period.
- Conduct scientific assessments of shale gas exploration and production risk and develop mitigating technologies and sponsor research projects to evaluate the occurrence, nature, and behavior of naturally occurring gas hydrates and the resulting resource, hazard, and environmental implications.
- Project American leadership in Fossil Energy technologies through active participation and collaboration with the international community. Continue the momentum for CCS in multilateral organizations including IEA, United Nations, World Energy Council (WEC), and the Carbon Sequestration Leadership Forum and bilaterals with key countries such as China and India.

FY 2014 Request Aligned with Strategic Plan Goals



Explanation of Changes

The Department's Office of Fossil Energy requests $637.975 million in FY 2014, which is a 15% increase over the current FY 2012 level. However, the FY 2012 level reflects a one-time offset of $187,000 from rescission of prior year balances.

Alignment to the Quadrennial Technology Review (QTR)

DOE's 2011 QTR emphasizes several strategies for DOE-funded research, including:

- Focusing "on innovation relevant to today's technologies"
- Carrying out "analyses, modeling and simulation, or other highly relevant fundamental engineering research activities that could influence the private sector in the nearer term"
- Devoting a fraction of it its effort to pursuing "disruptive breakthroughs"

FE's CCS RD&D focuses on the fossil fuels that account for most of the domestic energy consumed by large stationary sources. Eight fully-funded, large-scale CCS projects are being pursued to demonstrate the commercial scale integration of existing technologies, while maintaining reliable, predictable and safe plant operations. Second generation CCS technologies -- the primary focus of currently-funded R&D activities -- could contribute materially to domestic carbon mitigation by 2030. The economic viability of 2nd generation technologies is likely to depend either on a moderate carbon price or inclusion of value-added strategies such as CO_2 enhanced oil recovery (EOR). Also included is investment in transformational technology focusing on breakthroughs that could reduce the cost of CCS so that it will be deployable on a global scale without the need for a significant carbon price or EOR. FE, in partnership with other National Laboratories and key energy companies, is carrying out analyses, modeling and simulation activities under its Carbon Capture Simulation Initiative and National Risk Assessment Partnership, which are expected to reduce RD&D and CCS cost, and accelerate the pace of technology development and innovation.

Goal Program Alignment Summary

	Focus on near term critical CCS for clean coal.	Conduct natural gas research with DOI and EPA to address potential environmental, and safety impacts of gas development including hydraulic fracturing (fracking) and conduct Gas Hydrate research.	Maintain an SPR with a readiness and capability to respond quickly and effectively to potential disruptions in U.S. petroleum supplies (foreign or domestic).	Maintain a NEHHOR with 1 million barrels of heating oil to protect the Northeast against high vulnerability of winter-related supply shortages.	Close out 45 Areas of Concern at NPR-1 (Elk Hills, California) and initiate disposition of NPR-3 in FY 2015.
Fossil Energy Appropriation					
Coal	100%	0%	0%	0%	0%
Natural Gas Technologies	0%	100%	0%	0%	0%
Strategic Petroleum	0%	0%	100%	0%	0%
Northeast Home Heating Oil Reserve	0%	0%	0%	100%	0%
Naval Petroleum & Oil Shale Reserves	0%	0%	0%	0%	100%
Subtotal, Fossil Energy Appropriation	43%	3%	30%	1%	3%

Performance Measures

Performance Goal (Measure)	**CCS Demonstrations** - Initiate construction of CCS demonstration projects		
Fiscal Year	**2012**	**2013***	**2014**
Target	3 CCS projects initiated	2 CCS projects initiated	1 CCS project initiated
Result	3 CCS projects initiated		
Endpoint Aim	Initiate operations of at least five commercial scale CCS demonstrations by 2016 including the Clean Coal Power Initiative (CCPI), FutureGen 2.0, and the Industrial CCS Demonstration projects (includes projects funded by both annual appropriations and the American Recovery and Reinvestment Act). At least two of the five demonstrations to initiate operations by 2016 will be CCPI projects.		

*2013 targets represent DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012-2014 Annual Performance Plan & Report.

Performance Goal (Measure)	**Carbon Storage** - Inject 3.0 million (cumulative since 2009) metric tons of CO_2 in large-volume field test sites to demonstrate the formations capacity to permanently, economically, and safely store carbon dioxide.		
Fiscal Year	**2012**	**2013***	**2014**
Target	3 MMTs injected (since 2009)	4 MMTs injected (since 2009)	5 MMTs injected (since 2009)
Result	3 MMTs injected (since 2009)		
Endpoint Target	Inject 9.0 million metric tons of CO2 in large-volume field test sites representing different storage classes, since January 2009, to demonstrate and monitor for the formations capacity to permanently, economically, and safely store carbon dioxide. A long-term goal is to ensure the cost effective ability to measure and account for 99 percent of injected CO2 in all storage types while minimizing the environmental footprint of carbon storage activities.		

*2013 targets represent DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012-2014 Annual Performance Plan & Report.

Performance Goal (Measure)	**Drawdown Readiness** - Ensure drawdown readiness by achieving greater than 95% of monthly maintenance and accessibility goals.		
Fiscal Year	**2012**	**2013***	**2014**
Target	95% of monthly maintenance achieved	95% of monthly maintenance achieved	95% of monthly maintenance achieved
Result	95% of monthly maintenance achieved		
Endpoint Target	Achieve 95% of monthly maintenance and accessibility goals in all years.		

*2013 targets represent DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012-2014 Annual Performance Plan & Report.

Performance Goal (Measure)	**SPR Operating Cost** - Ensure cost efficiency of SPR operations by achieving low operating cost per barrel of capacity		
Fiscal Year	**2012**	**2013***	**2014**
Target	≤ $0.25 operating cost per barrel	≤ $0.25 operating cost per barrel	≤ $0.25 operating cost per barrel
Result	$0.22 operating cost per barrel		
Endpoint Target	< $0.25 operating cost per barrel		

*2013 targets represent DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012-2014 Annual Performance Plan & Report.

Performance Goal (Measure)	**Sustained (90 day) Drawdown Rate** - Enable ready distribution of SPR oil by achieving maximum sustained (90 day) drawdown rate of 4.4 million barrels per day.		
Fiscal Year	**2012**	**2013***	**2014**
Target	4.4 million barrels per day (MMB/Day)	4.25 MMB/Day drawdown readiness rate	4.25 MMB/Day drawdown readiness rate
Result	4.25 million barrels per day (MMB/Day)		
Endpoint Target	Maintain a 90 day drawdown rate of 4.4 million barrels per day		

*2013 targets represent DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012-2014 Annual Performance Plan & Report.

Facilities Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. Facilities Maintenance and Repair activities funded by the Office of Fossil Energy budget are displayed below.

Costs for Direct-Funded Maintenance and Repair (including Deferred Maintenance)

(dollars in thousands)

	FY 2012 Actual Cost	FY 2013 Planned Cost	FY 2014 Planned Cost
National Energy Technology Laboratory	21,315	---	13,145
Strategic Petroleum Reserve	37,134	---	41,142
Naval Petroleum and Oil Shale Reserve	1,370	---	490
Total, Direct-Funded Maintenance and Repair	50,894	48,870	54,777

Report on FY 2012 Expenditures for Maintenance and Repair

This report responds to legislative language set forth in Conference Report (H.R. Conf. Rep. No. 108-10) accompanying the Consolidated Appropriations Resolution, 2003 (Public Law 108-7) (pages 886-887), which requests the Department of Energy provide an annual year-end report on maintenance expenditures to the Committees on Appropriations. This report compares the actual maintenance expenditures in FY 2012 to the amount planned for FY 2012, including directed changes.

Total Costs for Maintenance and Repair

(dollars in thousands)

	FY 2012 Actual Cost	FY 2012 Planned Cost
National Energy Technology Laboratory	21,315	21,345
Strategic Petroleum Reserve	37,134	33,133
Naval Petroleum and Oil Shale Reserve	1,370	1,370
Total, Direct-Funded Maintenance and Repair	59,819	55,848

The SPR exceeded the planned funding for maintenance and repair activities due to emergency repair of a Big Hill transformer, unplanned replacement of PIV 20 at Bryan Mound, and repair of firewater leak at Bryan Mound. Additionally, the rework of pipeline valves at Bryan Mound and Bayou Choctaw was accelerated from FY 2013 to FY 2012.

Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
Fossil Energy Research and Development			
Carbon Capture	1,912	1,988	2,618
Carbon Storage	3,202	3,331	1,838
Advanced Energy Systems	2,773	2,877	1,446
Cross-cutting Research	1,188	1,352	537
Natural Gas	415	488	512
Unconventional Fossil Energy Technologies	138	145	0
Total, SBIR/STTR	9,628	10,181	6,951

Fossil Energy Research and Development
Office of Fossil Energy
Funding by Site by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Ames National Laboratory			
Coal	1,905	---	1,795
Total, Ames National Laboratory	1,905	---	1,795
Idaho National Engineering and Environmental Laboratory			
Natural Gas	30	---	436
Total, Idaho National Engineering and Environmental Laboratory	30	---	436
Lawrence Berkeley National Laboratory			
Coal	4,574	---	2,780
Natural Gas	375	---	150
Total, Lawrence Berkeley National Laboratory	4,949	---	2,930
Lawrence Livermore National Laboratory			
Coal	2,800	---	900
Total, Lawrence Livermore National Laboratory	2,800	---	900
Los Alamos National Laboratory			
Coal	4,578	---	2,205
Natural Gas	175	---	0
Total, Los Alamos National Laboratory	4,753	---	2,205
National Energy Technology Laboratory			
Coal	326,711	---	310,248
Program Direction	88,100	---	88,100
Fossil Energy Environmental Restoration	6,477	---	6,477
Unconventional Fossil Energy Technologies	4,688	---	0
Total, National Energy Technology Laboratory	443,111	---	365,296
Oak Ridge National Laboratory			
Coal	900	---	2,075
Total, Oak Ridge National Laboratory	900	---	2,075
Pacific Northwest Laboratory			
Coal	4,445	---	1,190
Total, Pacific Northwest Laboratory	4,445	---	1,190
Sandia National Laboratories			
Coal	788	---	291
Total, Sandia National Laboratories	788	---	291
Washington Headquarters			
Coal	8,054	---	4,624
Natural Gas	1,425	---	1,765
Program Direction	31,829	---	30,790

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Fossil Energy Environmental Restoration	1,420	---	1,420
Plant and Capital Equipment	16,794	---	13,294
Special Recruitment Programs	700	---	700
Unconventional Fossil Energy Technologies	171	---	0
Total, Washington Headquarters	60,393	---	52,593
Subtotal, Fossil Energy Research and Development	524,074	536,969	429,275

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Coal
Funding Profile

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Coal			
CCS Demonstration Programs	0	0	0
Carbon Capture and Storage, and Power Systems, (CCS&PS)	359,320	370,650	276,631
Total, Coal	359,320	370,650	276,631

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

SBIR/STTR:

- FY 2012 Transferred: SBIR: $7,998; STTR: $1,077
- FY 2013 Annualized amount: SBIR: $8,460; STTR: $1,088
- FY 2014 Request: SBIR $6,564: STTR: $936

Public Law Authorizations

Public Law 95-91

Overview

The Department's September 2011 Quadrennial Technology Review (QTR) outlines three challenges, energy security, environmental protection, and economic competitiveness to which FE's Coal Program aligns its activities: 1) Deploy the Technologies that have significant technical headroom, yet could be demonstrated at commercial scale within a decade and 2) Discover the New Solutions We Need like technologies that could have a consequential impact on meeting national energy goals in two decades, and 3) technologies that could be expected to be adopted by the relevant markets, understanding that these markets are driven by economics shaped by public policy.

The mission of the Coal Program's CCS Demonstration Programs, and CCS and Power Systems R&D activities is to support secure, affordable, and environmentally acceptable near-zero emissions fossil energy technologies. This will be accomplished via research, development, and demonstration to improve the performance of advanced CCS technologies. Commercial availability of CCS technologies will provide an option to use fossil fuel resources to provide energy and meet the President's climate goals.

Program Accomplishments and Milestones

FY 2012 Program Accomplishments and Milestones can be found in the CCS and Power Systems and CCS Demonstration Programs justifications.

Program Planning and Management

The Office of Clean Coal performs real-time performance tracking utilizing various systems that rely on data from a single corporate source of record. These systems track progress of multiple programs and projects, including project progress toward ARRA and GPRA quarterly milestones, annual program performance targets, and earned value. Additionally, the Coal Program conducts independent, periodic peer reviews to provide guidance and critical feedback on its programs' direction and plans. Some of these tools include:

- FE Dashboard: A comprehensive system that tracks progress and risk toward program quarterly milestones and annual goals, project information, and reporting of information.

- Standard Accounting and Reporting System (STARS): STARS provides the Department with a modern, comprehensive, and responsive financial management system that is the foundation for linking budget formulation, budget execution, financial accounting, financial reporting, cost accounting, and performance measurement. The system processes Departmental accounting information, including General Ledger, Purchasing, Accounts Payable, Accounts Receivable, and Fixed Assets. The system also includes budget execution functionality associated with recording appropriations, apportionments, allotments, allocations, and provides funds control for commitments, obligations, costs, and payments.

- Strategic Integrated Procurement Enterprise System (STRIPES):

STRIPES encompasses activities required or directly associated with planning, awarding, and administering various unclassified acquisition and financial assistance instruments. In general terms, the required activities are comprised of the following functions: acquisition/financial assistance planning; pre-solicitation documentation generation; solicitation development; evaluation and award; administration, including approving payment requests; and instrument closeout. Additional functions provided, which are directly associated with the planning, awarding, and administering of the instruments, include: interfacing with internal and external systems, such as STARS, the iManage Data Warehouse, FedBizOpps, and the Central Contractor Registration; workload management; workflow capabilities; and appropriate reporting capabilities for both internal and external purposes.

- Primavera and MS Project:
  Software tools that track project progress toward goals and milestones.
- iPortal:
  The iPortal will provide personalized dashboards, messaging (thresholds/alerts), discussion boards, collaboration capabilities, news, reporting, graphing, and data exchange capabilities to DOE executives, managers and staff.

Strategic Management

In meeting the identified challenges to clean fossil energy, the Department will implement key strategies to more efficiently and effectively manage the program, thus putting the taxpayers' dollar to more productive use, including reducing greenhouse gas emission by 17% by 2020 and 83% by 2050, from a 2005 baseline.

Program Goals and Funding

In FY 2014, the Coal program will be working to achieve the following goals:

- Initiate construction of at least one Clean Coal Power Initiative demonstration project.
- Advanced Energy Systems with CO_2 capture at a 13% cost reduction per tonne of CO2 captured (2011 dollars).
- Inject 5.0 million metric tons of CO_2 in large-volume field test sites

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
CCS Demonstration Programs			
This program currently manages projects that are fully funded with prior year appropriations.	0	0	0
CCS and Power Systems			
Increased level of funding for Carbon Capture ($45M), including transitioning and scaling-up multiple, advanced CO_2 capture technologies pursued by the ARPA-E and EFRC programs between 2009 and 2013 to the Fossil Energy Carbon Capture Program. $25M is allocated to fund (through a competitive inducement prize or other appropriate funding mechanism) a solicitation to demonstrate the first commercial natural gas combined cycle plant to capture and store 75% or more of the CO2 emissions.			
The requested decrease in funding for Carbon Storage (-$51M), maintains a minimum level of funding for current activities and focuses budgetary resources on advancements in carbon capture.			
The requested decrease in funding for Advanced Energy Systems (-$49M) will focus resources on activities related to pressurized oxy-boiler and chemical looping combustion. Of the eight projects that were selected in the FY2012 FOA, four will be down-selected according to their performance and potential merits and Gasification Systems will continue to support the construction of the 100 TPD ITM oxygen plant and R&D activities in coal dry feed systems and hydrogen membrane separation. The Hydrogen Turbines program will focus on the development of advances in 2nd generation hydrogen turbine component technologies.			
The requested decrease in funding levels for Cross-cutting Research (-$27M) reflects the shift in focus toward sensor technologies that have potential benefits to maximize plant efficencies and reduce emissions to both existing and new fossil-fueled power plants.			
	359,320	276,631	-82,689
Total, Coal	359,320	276,631	-82,689

CCS Demonstration Programs
Funding Profile by Subprogram

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Clean Coal Power Initiative (CCPI)*	0	0	0
FutureGen 2.0**	0	0	0
Industrial Carbon Capture and Storage**	0	0	0
Total, CCS Demonstration Programs	0	0	0

*Funded through Base Appropriations and the American Recovery and Reinvestment Act

**American Recovery and Reinvestment Act Program

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Overview

The Clean Coal Power Initiative (CCPI) program has provided government co-financing for new coal technologies that have helped utilities cut sulfur, nitrogen and mercury pollutants from power plants and aims to reduce greenhouse gas emissions by boosting plant efficiencies and capturing and storing carbon dioxide. All projects from Round I have been completed, but projects from Rounds II and III are still ongoing and in various stages of development. In addition to the CCPI program, FER&D manages two American Recovery and Reinvestment Act CCS demonstration programs: FutureGen 2.0 and the Industrial Carbon Capture and Storage program. The ability to demonstrate advanced technologies at scale that have been developed in the FER&D or other R&D programs is an important benefit of the demonstration programs. In addition, successful completion of the existing projects will help in meeting the President's broad national energy goal for reducing greenhouse gas emissions by 17% by 2020 and 83% by 2050, from a 2005 baseline.

Program Accomplishments and Milestones

The CCS demonstration projects are at varying stages of project definition, design, construction, and operation. Overall, the projects are progressing satisfactorily.

1) There are currently eight active CCS demonstration projects at varying stages of project definition, design, construction, and operation:
   - Four under the Clean Coal Power Initiative (CCPI),
   - Three under Industrial Carbon Capture and Storage (ICCS),
   - FutureGen 2.0.
2) The Air Products ICCS project has completed major construction activities and begun commercial operation. The project has captured and stored over 100,000 tons of CO2.
3) One CCPI project (Kemper) and one ICCS project (Archer Daniels Midland (ADM)) are currently under construction.

Benefits

- Public Benefits
- Reduced cost of achieving carbon emissions reductions.
- Reduced environmental impacts of using domestic fossil resources.

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Continue activities under the CCS Demonstrations Programs using prior year appropriations	0
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): Continue activities under the CCS Demonstrations Programs using prior year appropriations	

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2014	Continue activities under the CCS Demonstrations Programs using prior-year appropriations	0

Carbon Capture and Storage and Power Systems
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Carbon Capture			
Post-Combustion	53,955	---	75,000
Natural Gas Capture	0	---	25,000
Pre-Combustion	13,031	---	12,000
Total, Carbon Capture	**66,986**	**69,320**	**112,000**
Carbon Storage			
Regional Carbon Sequestration Partnerships	80,882	---	40,495
Geological Storage Technologies	14,563	---	5,474
Monitoring, Verification, Accounting and Assessment	6,551	---	4,900
Carbon Use and Reuse	756	---	500
Focus Area for Carbon Sequestration Science	9,456	---	9,726
Total, Carbon Storage	**112,208**	**116,116**	**61,095**
Advanced Energy Systems			
Advanced Combustion Systems	15,499	---	14,000
Gasification Systems	37,918	---	23,000
Hydrogen Turbines	14,583	---	11,000
Coal and Coal-Biomass to Liquids	4,862	---	0
Solid Oxide Fuel Cells	24,307	---	0
Total, Advanced Energy Systems	**97,169**	**100,554**	**48,000**
Cross-cutting Research			
Plant Optimization Technologies			
Sensors, Controls and Other Novel Concepts	12,447	---	4,275
Cross-cutting Materials R&D	837	---	2,500
Coal Utilization Science			
Computational System Dynamics	11,472	---	4,350
Computational Energy Science	13,000	---	4,350
Energy Analyses			
Environmental Activities	450	---	450
Technical and Economic Analyses	500	---	500
System Analysis/Product Integration	4,000	---	0
University Training and Research			
University Coal Research	2,917	---	2,000
Historical Black Colleges and Universities & Training	973	---	750
International Activities			
Coal Technology Export	650	---	650
International Program Support	700	---	700
Total, Cross-cutting Research	**47,946**	**49,435**	**20,525**
NETL Coal Research and Development	**35,011**	**35,225**	**35,011**
Total, CCS and Power Systems	359,320	370,650	276,631

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- FY 2013 Annualized: SBIR $8,763; STTR: $1,128
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Public Law Authorizations

Public Law 95-91

Overview

The CCS and Power Systems program conducts research to reduce carbon emissions by improving the performance and efficiency of fossil energy systems and carbon capture and storage (CCS) technologies. The Department is developing advanced fossil energy technology that will facilitate the commercial deployment of highly efficient fossil power plants capable of achieving near-zero atmospheric emissions. FE's CCS and Power Systems program is leading efforts to make possible greater utilization of the nation's fossil energy resources in an environmentally sound and economically competitive way. The core R&D efforts of the CCS and Power Systems program focuses on a variety of technologies that can reduce the carbon footprint of existing and future fossil energy systems.

The NETL Direct Research and Development program funds in-house activities supporting CCS and Power Systems. This funding supports Federal researchers directly associated with conducting basic and applied research activities specific to CCS and Power Systems in Carbon Capture, Carbon Storage, Advanced Energy Systems and Cross-cutting Research.

Program Accomplishments and Milestones

In FY 2012, CCS and Power Systems achieved the following accomplishments:

1) Conducted over 2,000 hours of post-combustion capture pilot-scale testing;
2) Initiated large-scale projects to inject, monitor, and store carbon dioxide at two additional Regional Carbon Sequestration Partnerships (RCSP);
3) Received recognition from *R&D Magazine* for developing [Platinum / Chromium Alloy, APECS v2 with ANSYS Design Xployer™ ROM Builder, and Mn-Co Coating for Solid Oxide Fuel Cells] – three technologies listed as among the 100 most significant in the past year;
4) Completed initial prototype testing on piezoelectric and fiber optic based sensors for high temperature combustion conditions;
5) Completed 100 hours of combustion testing to assess second generation design concepts for oxy-fired boilers;
6) Completed construction, commissioning and testing of one Oxygen Transport Membrane (OTM) module;
7) Achieved 50% construction completion on a 30-100 ton per day Ion transport Membrane oxygen system; and
8) Commenced testing of a novel dry gasification feed system.

Milestone	**Date**
Complete evaluation of two CO_2 utilization technologies to convert CO_2 into useful products	2nd Qtr FY
Complete hydrogen turbine hot gas ingestion rig testing of optimized wheel space geometry	3rd Qtr FY 2013
Begin extensive monitoring of large-scale injection and storage of CO_2 at two RCSPs field projects	
Initiate construction of slipstream-scale (0.5-5 MWe) post-combustion carbon capture system/component pilot project	
Complete reduced order reservoir models to predict pressures and saturation over time to within 10% of prediction from detailed models for major storage formations types and demonstrated on at least 2 actual storage formations	
Complete high fidelity multi-scale kinetic/diffusion model for amine based solid sorbents	
Complete evaluation of advanced oxycombustion technologies through systems evaluation	4th Qtr FY 2013
Complete construction of 30-100 TPD ion transport membrane oxygen system	
Select and award projects from FOA's solicitation in the following topics: Oxy-combustion, sensors and controls, monitoring, verification, and accounting technologies, and University Grant Programs (UCR and HBCU/OMI)	

Program Planning and Management

The CCS and Power Systems program, included within FER&D, conducts R&D on technologies to significantly reduce coal power plant emissions and substantially improve efficiency to reduce carbon emissions, leading to viable near-zero atmospheric emissions coal energy systems and supporting carbon capture and storage.

Strategic Management

In meeting the identified challenges to clean fossil energy, the Department will implement five key strategies to more efficiently and effectively manage the program, thus ensuring the taxpayers' investment is put to productive use.

1. Coal's R&D program will partner with the private sector, national laboratories, university and international partners to develop advanced CCS and Power Systems technologies.
2. Natural Gas Capture, along with Carbon Capture and Storage (CCS) technologies will need to be broadly applied to meet long-term climate change goals. $25M is allocated to fund (through a competitive inducement prize or other appropriate funding mechanism) a solicitation to demonstrate the first commercial natural gas combined cycle plant to capture and store 75% or more of the CO_2 emissions.
3. Provide analysis of how improvements in CCS technologies impact the cost of achieving carbon emissions reductions goals.
4. Pursue advanced modeling and simulation to accelerate and reduce the risk of the development timeframe.
5. Nurture ties with countries and organizations pursuing state-of-the-art CCS RD&D to leverage resources.

Two external factors present the strongest impacts to the overall achievement of the program's strategic goal:

1. Power demand and environmental factors beyond the scope of DOE R&D programs; and
2. Industry's inclination to focus on near-term deployment using proven technologies.

Program Goals and Funding

In FY 2014, CCS and Power Systems will be working to achieve the following goals:

- Advanced Energy Systems with CO_2 capture at a 13% cost reduction per tonne of CO2 captured.
- Inject 5.0 million metric tons of CO_2 in large-volume field test sites.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Carbon Capture			
Post-combustion			
The requested funding level includes transitioning and scaling-up multiple, advanced CO_2 capture technologies including those pursued by the ARPA-E and EFRC programs between 2009 and 2013 to the Fossil Energy Carbon Capture Program through a competitive solicitation.	53,955	75,000	+21,045
Natural Gas Capture			
Carbon Capture and Storage (CCS) technologies will need to be broadly applied to meet long-term climate change goals. $25M is allocated to fund (through a competitive inducement prize or other appropriate funding mechanism) a solicitation to demonstrate the first commercial natural gas combined cycle plant to capture and store 75% or more of the CO_2 emissions.	0	25,000	+25,000
Pre-combustion			
The requested funding level is sufficient to maintain focus on current scope of activities.	13,031	12,000	-1,031
Total, Carbon Capture	**66,986**	**112,000**	**+45,014**

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Carbon Storage			
Regional Carbon Sequestration Partnerships			
The requested FY2014 funding level focuses resources on large volume development tests of sequestration technologies, injection techniques and monitoring at selected geologic site locations.	80,882	40,495	-40,387
Geologic Storage Technologies			
The requested FY2014 funding level focuses resources on current activities that are conducting initial development of the most promising tools and technologies to deliver safe and permanent storage options for CO2.	14,563	5,474	-9,089
Monitoring, Verification, Accounting and Assessment			
The requested FY2014 funding level focuses resources on the most promising technology areas.	6,551	4,900	-1,651
Carbon Use and Reuse			
This area of research is a low priority relative to other activities which are expected to yield greater public benefits.	756	500	-256
Focus Area for Carbon Sequestration Science			
The requested funding level is sufficient to maintain focus on the current scope of activities.	9,456	9,726	+270
Total, Carbon Storage	**112,208**	**61,095**	**-51,113**
Advanced Energy Systems			
Advanced Combustion Systems			
The requested FY2014 funding level focuses resources on activities related to pressurized oxy-boiler and chemical looping combustion. Eight projects were selected in the FY2012 FOA. They will be downselected to the four most promising projects according to performance and other project merits.	15,499	14,000	-1,499
Gasification Systems			
The requested FY2014 funding level continues to support the construction of the 100 TPD ITM oxygen plant and R&D activities in coal dry feed systems and hydrogen membrane separation.	37,918	23,000	-14,918
Hydrogen Turbines			
The requested FY2014 funding level focuses resources on the development of advances in 2nd generation hydrogen turbine component technologies.	14,583	11,000	-3,583
Coal and Coal Biomass to Liquids			
This area of research is a low priority relative to other activities which are expected to yield greater public benefits.	4,862	0	-4,862
Solid Oxide Fuel Cells			
The program has prioritized near-term CCS technologies. SECA Core Technology R&D will continue and then complete existing work with prior year funding – no new Core Technology effort will be initiated in FY 2014.	24,307	0	-24,307
Subtotal, Advanced Energy Systems	**97,169**	**48,000**	**-49,169**

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Cross-cutting Research			
Plant Optimization Technology			
Sensors & Controls			
The requested FY2014 funding level represent the shift in focus toward sensor technologies that have potential benefits to maximize plant efficiencies and reduce emissions to both existing and new fossil-fueled power plants.	12,447	4,275	-8,172
Crosscutting Materials R&D			
The requested FY2014 funding level is sufficient to maintain focus on the current scope of activities and initiate critical ASME code testing for the next class of ultra supercritical materials.	837	2,500	1,663
Coal Utilization Science			
Computational System Dynamics			
The requested FY2014 funding level represents a shift in focus to technologies that have potential benefits to both existing and new fossil fueled power plants. Funding will rescope the efforts on critical NRAP modeling development and de-emphasized the efforts on modeling next generation power plans.	11,472	4,350	-7,122
Focus Area for Computational Energy Science			
The requested FY2014 funding level represents a shift in focus to technologies that have potential benefits to both existing and new fossil fueled power plants. Funding will rescope the effort on critical CCSI modeling development and de-emphasized the efforts on modeling of physical phenomenon.	13,000	4,350	-8,650
Energy Analyses			
The requested FY2014 funding level will maintain focus on technical outreach support for advanced technologies commercialization efforts.	4,950	950	-4,000
University Training and Research			
University Coal Research			
The requested FY2014 funding level will continue to support grants to Universities under the University Coal Research program.	2,917	2,000	-917
HBCU's Education and Training			
The requested FY2014 funding level will continue to support grants to Historically Black Colleges and University.	973	750	-223
International Activities			
The requested FY2014 funding level maintains focus on the current scope of activities.	1,350	1,350	0
Subtotal, Cross-cutting Research	**47,946**	**20,525**	**-27,421**
NETL Coal Research and Development			
No change in funding.	35,011	35,011	0
Subtotal, NETL Coal Research and Development	**35,011**	**35,011**	**0**
Total, CCS and Power Systems	**359,320**	**276,631**	**-82,689**

Carbon Capture

Overview

The Carbon Capture activity is focused on the development of post-combustion and pre-combustion CO_2 capture and compression technologies for new and existing power plants. Post-combustion CO_2 capture technology R&D is focused on pulverized coal (PC) power plants, which is the current standard industry technology for coal-fueled electricity generation. The Natural Gas Capture subactivity is focused on facilitating the demonstration of the first commercial natural gas combined cycle (NGCC) power plant to capture and store 75% or more of the CO_2 emissions. Pre-combustion CO_2 capture is applicable to gasification-based systems such as Integrated Gasificiation Combine Cycle (IGCC), a potential technology for future generation of electricity from coal-fueled plants.

Post-Combustion

The Post-Combustion subactivity focuses specifically on developments related to 2nd generation technologies that can achieve CO_2 capture at $40/tonne CO_2 capture cost for new and existing conventional coal-fired power plants. 2nd generation technologies are those that are not currently in commercial application at any scale or level of integration, but have potential to improve the efficiency or reliability of carbon capture processes. Significant improvements in both cost and efficiency of CO_2 separation and compression will be required to achieve this goal. Critical R&D milestones have been achieved by laboratory- through pilot-scale testing of a broad spectrum of CO_2 capture approaches including advanced solvents, sorbents, and membranes since 2008; and initiation of multiple, small-scale (0.5-5 MWe) slipstream tests of the most promising of these CO_2 capture technologies that began in 2010..

This subactivity also coordinates its efforts with ARPA-E and EFRC and will pursue the development, scale-up and field testing of multiple advanced and transformational capture technologies including those pursued under these programs between 2009 and 2013, through a competitive solicitation. Continued technology development is necessary to integrate these technologies into “real world” flue gas conditions.

Natural Gas Capture

The Natural Gas Capture subactivity will focus on carbon capture technologies that are critically important to natural gas application. This effort will support (through a competitive inducement prize or other appropriate funding mechanism) demonstration of the first commercial natural gas combined cycle (NGCC) power plant to capture and store 75% or more of the CO_2 emissions

Pre-Combustion

The Pre-Combustion subactivity focuses on development of 2nd generation technologies for pre-combustion capture (e.g., IGCC) that achieve CO_2 capture at $40/tonne removed CO_2 capture cost. Significant improvements are required to reduce parasitic energy load and cost, and many technologies that are available in the near-term have not been scaled up or applied to fossil fuel-powered generation systems. Critical R&D milestones have been achieved through laboratory-scale testing of novel solvent, sorbent, and membrane technologies.

Benefits

Public Benefits

- Reduced cost of achieving carbon emissions reductions.
- Reduced environmental impacts of using domestic fossil resources.
- Increased spillover benefits from technological innovations as a result of R&D.

Funding Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Completed laboratory-scale test runs of solvent technologies for post-combustion carbon capture, performed initial stability tests of a membrane contactor, performed slipstream testing of several post-combustion capture technologies (baseline amine solvent, advanced amine solvent, membrane, enzyme) at NCCC on a real flue gas stream, and	66,986

Fiscal Year	Activity	Funding (dollars in thousands)
	tested advanced, pre-combustion capture membrane technologies at laboratory-scale and also at NCCC.	
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): Continue advanced laboratory scale and small pilot scale slipstream R&D for pre-IGCC and post-combustion (Pulverized Coal) CO_2 capture technologies.	
FY 2014	Continue advanced laboratory scale and small pilot scale slipstream R&D for pre- (IGCC) and post-combustion (Pulverized Coal) CO_2 capture technologies. Continue R&D of the most promising ARPA-E and EFRC capture technologies under the FE Capture Program. Initiate an effort that incentivizes a demonstration of the first commercial NGCC facility that captures and stores 75% or more of its CO_2 emissions.	112,000

Carbon Storage

Overview

The overall goal of the Carbon Storage Program is to develop and validate technologies to ensure safe and permanent geologic storage of captured CO_2. Development and validation of these technologies is critical to ensure industry and regulatory agencies have the capability to monitor and account for CO_2 and ensure the viability of carbon storage as an effective technology solution that can be implemented on a large-scale to mitigate carbon emissions. Applied R&D and field projects are being conducted in five primary storage types (saline formations, oil and gas reservoirs, unmineable coal seams, basalts, and organic shales) across eleven different geologic storage formation classes. Technologies developed and validated through the Carbon Storage Program will improve storage efficiency and reduce the overall cost of CCS with a goal of ensuring the cost effective ability to measure and account for 99 percent of injected CO_2 in all storage types while minimizing the environmental footprint of carbon storage activities.

Regional Carbon Sequestration Partnerships

The Regional Carbon Sequestration Partnerships (RCSP) subactivity focuses on development and validation of technologies, infrastructure, and human capital through the RCSPs and other small- and large-scale field projects. These field projects conduct regional and site-specific characterization and validation; simulation and risk assessment; and application of monitoring, verification and accounting technologies in various depositional environments. They provide the needed understanding of CO_2 injection, fluid flow and pressure migration, geomechanical and geochemical impacts to CO_2 injection, and developing a "commercial toolbox" for cost-effective monitoring in all storage types. These field projects are critical to deployment of safe and permanent storage and monitoring.

Field projects conducted under this technology area are implemented in three phases: (i) Regional and Site Characterization; (ii) Site and Injection Operations; and (iii) Post-Injection Monitoring Operations. Regional characterization activities are focused on identifying regional opportunities for CCS, CO_2 sources, and priority opportunities for field sites. Site characterization evaluation builds on previous characterization with greater detail to ensure a field project site has suitable geologic characteristics for safe injection and post-injection operations. Both small- and large-scale field projects integrate CO_2 capture, transportation, injection, and storage such that it can be achieved safely and permanently. As part of the field projects, project developers and regulatory agencies are addressing regulatory and public outreach and education issues associated with carbon storage. Resource assessment is also a critical component of this effort, regional understanding of storage types and estimated storage potential aids in the development of carbon mitigation plans and provides the foundation for first-mover projects. All of this information is made available to the public through the DOE's NATCARB geographic information system.

Geologic Storage Technologies

The Geologic Storage Technologies subactivity is focused on developing and validating storage simulation and risk assessment technologies that have the potential to safely, permanently, and cost effectively store CO_2 in geologic formations. This area involves developing technologies to improve construction material resistance to CO_2 and reservoir minerals, fluids and by-products; mitigate CO_2 leakage pathways; manage fluid flow, pressure and water; and minimize negative geochemical and geomechanical impacts. The simulation and risk assessment models integrate storage technologies with field operations for CO_2 flow and trapping mechanisms, geochemical changes, and geomechanical impacts within the geologic formations in all storage types. These technologies help maintain the integrity of the storage operations to ensure 99 percent storage permanence and optimize storage capacity.

Monitoring, Verification, Accounting and Assessment

The Monitoring, Verification, Accounting, and Assessment (MVAA) subactivity focuses on the critical components of geologic storage operations that track the transport and fate of injected CO_2. Technologies being developed and validated in field projects monitor CO_2 at atmospheric, near-surface and subsurface levels for integration into an intelligent monitoring system. MVAA of geologic storage sites addresses safety and environmental concerns; verifies inventory; and accounts for greenhouse gas (GHG) emissions mitigation to help achieve GHG reduction goals. Research focuses on technologies such as open path detection of CO_2 anomalies in the atmosphere with remote sensing and improved geophysical data acquisition tools, analysis, and tracking of CO_2 in the subsurface. These technological advances improve our ability to ensure 99 percent storage permanence and optimize storage capacity.

Carbon Use and Reuse

The Carbon Use and Reuse subactivity focuses on technologies, other than enhanced hydrocarbon recovery, that have the potential to reduce CO_2 emissions by developing beneficial uses for the CO_2. These beneficial uses include the conversion of CO_2 to chemicals, plastics, building materials, and curing for cement.

Focus Area for Carbon Sequestration Science

The Focus Area for Carbon Sequestration Science supports the Carbon Storage Program through complementary research support and validation of technologies applied in Regional Carbon Sequestration Partnerships field projects. Some R&D activities that this subactivity focuses on include (1) multiphase flow and CO_2 reactions in injection (reservoirs) and confining (seals) zones; (2) fundamental processes and properties of geologic storage necessary to optimize simulations and operations; (3) development and refinement of modeling methodologies for estimates of storage capacity in all storage types; (4) modeling and development of tools to investigate coupled effects and predict location of leakage and verify storage permanence, as well as enhance integration and interpretation of MVAA data; (5) geospatial data resources and management of the NATCARB system and energy data exchange (EDX) to archive data from the R&D field projects to ensure access and consistency by other researchers and (6) fundamental science and engineering support of novel CO_2 use, re-use and conversion.

Benefits

Public Benefits

- Increased certainty of carbon emissions reductions.
- Minimized the environmental impacts of using carbon storage.
- Increased spillover benefits from technological innovations as a result of R&D.

Funding Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Injected 3.6 million metric tons of CO_2 cumulatively at large-volume field tests since 2009 to validate geologic storage technologies. Two additional RCSPs began large-scale projects that inject carbon dioxide for utilization and geologic storage. Continued characterization efforts at other RCSPs to support CO_2 injection and storage/utilization efforts. Continued core R&D activities to improve understanding of science behind CO_2 and co-contaminants flow and reactions in formation rocks and seals, evaluate advanced geophysical tools to monitor CO_2 plume, and continue evaluation of CO_2 for beneficial use.	112,208
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): Continue carbon storage activities through Core R&D and Regional Carbon Sequestration Partnership efforts.	
FY 2014	Inject 5.0 million metric tons of CO_2 cumulatively at large-volume field projects since 2009. RCSP Technology Area will continue regional characterization and field (injection) projects to validate geologic storage of CO_2 as a viable technology option. Core R&D Technology Areas will continue to develop and validate technologies to increase understanding of geologic formations appropriate for CO_2 storage; monitor and account for CO_2; mitigate potential risks; improve storage efficiency; develop tools to reduce uncertainty associated with long-term storage operations; and develop technologies for use and reuse of CO_2 to commercial products.	61,095

Advanced Energy Systems

Overview

The Advanced Energy Systems (AES) are integral parts of the CCS and Power Systems R&D Program. The AES mission is to increase the availability and efficiency of fossil energy systems integrated with CO_2 capture, while maintaining the highest environmental standards. The program elements focus on gasification, oxy-combustion, advanced turbines, and other energy systems. While the primary focus is on coal-based power systems, improvements to many of these technologies will result in positive spillover benefits that also reduce the cost of converting other carbon-based materials, such as biomass, petcoke or natural gas, into power and value-added products in an environmentally-acceptable manner.

Advanced Combustion Systems

This subactivity focuses on development of advanced combustion technologies, such as pressurized oxy-combustion and chemical looping processes, which have the potential to achieve $40/tonne CO_2. These advanced technologies are applicable to new and existing power plants. The application of these technologies today would result in a capture cost of more than $60/tonne CO_2 captured, compared with the current state of the art for a pulverized coal-fired plant. A critical R&D milestone is to initiate bench scale testing of the most promising advanced oxy-combustion and chemical looping technologies in 2014.

Advanced Combustion Systems also focuses on high performance materials R&D activities to validate the performance of the alloys developed in the Cross-Cutting Materials R&D through application in ultrasupercritical and oxy-combustion power plant environments which operate at significantly higher temperatures and pressures relative to current technologies.

Gasification Systems

This subactivity focuses on technology developments to increase gasification efficiency and availability to improve the performance of systems that convert fossil fuels to electricity and marketable bi-products. Research activities aim to increase, through design and plant integration, the efficiency of fuel and oxygen feed to IGCC power systems with CO_2 capture; improve high-pressure solid feed systems to enable use of low-rank coals in high-pressure gasifiers, facilitate co-feeding of coal with biomass or waste, and encourage more efficient high-pressure operation of dry feed gasifiers; and, further develop Ion Transport Membrane (ITM) technology to lower the capital requirements of oxygen production resulting in more efficient IGCC plants. In addition, this subactivity supports development of durable refractory materials, creates models to better understand the kinetics and particulate behavior of fuel inside a gasifier, and develops solutions to mitigate the plugging and fouling of syngas coolers.

A major cost element in gasification plants is converting raw syngas into a pure and specific gas used to create the plant's output of electricity and other byproducts. High hydrogen, low methane, ultra-clean syngas is versatile and can be used for power production with CO_2 capture, fuels or chemicals production, and for many polygeneration applications. The technologies being developed are focused on high-efficiency processes that operate at moderate to high temperatures and clean syngas of all contaminants.

Hydrogen Turbines

The Hydrogen Turbines subactivity focuses on the development of turbine component technologies capable of withstanding the high temperatures and aggressive environments that are predicted for high-hydrogen content syngas combustion. Current activities support development of key turbine system components capable of achieving a 4 percentage point efficiency increase relative to existing combined cycle turbines. Specifically, research focuses on rig testing of materials and components to be used in commercial scale machines, including combustor components, rotating parts, and cooling systems. These technologies will reduce interstage leakage via improved sealing designs, optimize airfoil heat flux with reduced cooling flows, improve material architectures for higher temperature operation, and result in superior airfoils for more efficient expansion with higher throughput.

Hydrogen from Coal

No funding is requested in the FY 2014 appropriation for this activity.

Coal and Coal-Biomass to Liquids

No funding is requested in the FY 2014 appropriation for this activity.

Solid Oxide Fuel Cells

No funding is requested in the FY 2014 appropriation for this activity.

Benefits

Public Benefits

- Reduced cost of achieving carbon emissions reductions.
- Increased efficiency and reliability of power generation advanced fossil fuel systems.
- Minimized the environmental impacts of using domestic fossil resources.
- Increased spillover benefits from technological innovations as a result of R&D.

Funding Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Advanced Combustion Program, A) completed construction and initiate operation of 1) a 1 MWe pilot-scale, calcium-based chemical looping combustion technology capable of 100 percent CO_2 capture, 2) 1 oxygen transport membrane (OTM) module, and B) Complete 110 hours of oxy-combustion testing at the 3 MWe pilot scale using West Virginia bituminous coal. Gasification Program, complete construction and testing of a warm gas H2/CO_2 separation membrane at 12 lb/hr, operate on real coal derived synthesis gas and complete systems analysis based on results. Hydrogen & Fuels Program, completed over 1,200 hours of membrane tests on actual syngas. Fuel Cell Program, completed testing of the non-repeat hardware for the proof-of-concept SOFC module. Hydrogen Turbine program, conduct full-scale, full-can tests of the "pre-production" high-hydrogen combustion nozzle technology to demonstrate the ability to meet relative efficiency targets with low NOx emissions at required gas turbine firing temperatures	97,169
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): Continue Advanced Energy Systems core R&D activities which include the completion of detail design and construction of the Warm Gas Cleanup slipstream system that will reduce parasitic load, start the operation of the 100 T/D ITM pilot plant, continue to create advanced technology and subsystems for turbines that will permit the design of IGCC plants to achieve or surpass goals for carbon capture with less than 10% increase in COE over baseline IGCC without CCS, and implement advanced combustion projects selected in the FY2012 FOA.	
FY 2014	Combustion R&D will finalize design of pressurized oxycombustion and chemical looping pilot test facility and initiate construction of pilot-scale pressurized oxy-combustion and chemical looping testing. Gasification R&D focused on operating the Warm Gas Cleanup test system, the 100 TPD ITM oxygen system, and will develop advanced technologies that enable IGCC to achieve	48,000

Fiscal Year	Activity	Funding (dollars in thousands)
	or surpass goals for cost and carbon capture. It will also continue to develop transformational technologies that benefit IGCC. Hydrogen Turbine Program R&D activities include leading to down selections of key turbine components including the combustion system at 2012 or H-class conditions. The down selected technologies, with system level specifications, will position the program for a detailed design phase of the 2015 hydrogen turbine.	

Cross-cutting Research

Overview

The Cross-cutting Research activity serves as a bridge between basic and applied research by fostering the development of innovative systems for improving availability, efficiency, and environmental performance of fossil energy systems with carbon capture and storage. This crosscutting effort is implemented through the research and development of sensors, controls, and advanced materials. This program area also develops computation, simulation, and modeling tools focused on optimizing plant design and shortening developmental timelines. In addition, the Cross-cutting Research program area supports science and engineering education in minority colleges and universities.

Plant Optimization Technologies

Sensors, Controls and Other Novel Concepts

The Instrumentation, Sensors & Control element focuses on the development of sensors critical to the implementation and optimization of advanced fossil fuel-based power generation systems, including sensors capable of monitoring key parameters (temperature, pressure, and gas composition) and operating in high temperature, high pressure, and corrosive environments. This involves development of innovative analytical techniques for on-line industrial use, along with technologies that meet the immediate high-priority measurement need. The controls research effort centers around self-organizing information networks and distributed intelligence for process control and decision making. For example, research examines fundamental combustion and gasification chemistry to discern rates and mechanisms affecting emissions behavior under combustion/gasification conditions.

Cross-cutting Material R&D

Cross-cutting Materials R&D focuses on developing fundamental materials applicable to the full range of fossil fuel power generation technologies. Computational techniques to design and develop optimal materials for use in advanced combustion and gasification systems are being developed. Continue development of alloys based on refractory metal elements such as Nb, Mo, Cr and W to withstand the high temperatures and aggressive environments that are predicted for oxy-fuel turbines, hydrogen turbines and syngas turbines. This computational work will decrease the time to develop the new materials that will enable the next generation of fossil energy power systems.

Coal Utilization Science

Computational Systems Dynamics

The Computational System Dynamics element develops the capability to utilize immersive, interactive, and distributed visualization technology in the design of advanced fossil power systems under development in the Advanced Energy Systems activity. These will also implement the use of distributed, computer-aided design tools, as well as developing system tools that will allow the integrated use of information technology in advanced fossil power systems design including carbon capture. This program will also fund a multi-laboratory carbon storage modeling effort defined as the National Risk Assessment Partnership (NRAP). NRAP harnesses the breadth of capabilities across the DOE national lab system to develop a defensible, science-based quantitative methodology for determining risk profiles at carbon dioxide (CO_2) storage sites. These collaborative efforts will accelerate CCS development and support the goal to enable commercial deployment of CCS technologies by 2020.

Computational Energy Science

Computational Energy Science element develops models of physical phenomenon occurring in fossil fuel conversion processes as well as carbon capture systems. Activities in this element include multi-scale, multi-physics simulation capabilities that couple fluid flow, heat and mass transfer, and complex chemical reactions for optimizing the design and operation of fuel cells, heat engines, combustors, gasifiers, chemical reactors, and other important unit processes in advanced power generation systems. The Carbon Capture Simulation Initiative (CCSI) focuses on capture technologies, risk assessment, and integrated multi-scale physics-based simulations designed to support the applied research conducted in the Carbon Capture activity. These activities will accelerate CCS development and support the goal to enable commercial deployment of CCS technologies by 2020.

Energy Analyses

Environmental Activities

Analyses include potential environmental impacts (e.g., on water quality, air emissions, solid waste disposal, climate change) of fossil fuel use and large-scale deployment of different generations of CCS. Of particular interest are the life cycle environmental emissions for existing and advanced fossil fuel technologies

Technical and Economic Analyses

The Technical and Economic Analyses element supports program strategic planning by identifying major challenges, technologies, and advanced concepts that have the potential to improve the efficiency, cost, and/or environmental performance of fossil energy systems. These analyses include technical and economic studies such as benefit cost analysis and CCS deployment projections.

System Analysis/ Product Integration

No funding is requested in the FY 2014 appropriation for this element.

University Training and Research

University Coal Research

The University Coal Research (UCR) Program provides grants to colleges and universities to support research consistent with the CCS and Power Systems program. Through research grants, the UCR program supports the education of students in the area of fossil energy systems. Key research areas that will be supported include, but are not limited to, advanced power systems including near-zero emission power plants; CCS; development of advanced high performance materials; harsh environment sensors and controls; and the development of advanced fossil based power generation systems.

HBCU's Education and Training

The Historical Black Colleges and Universities (HBCU) and Other Minority Institutions (OMI) education and training program awards research grants to HBCUs and OMIs which emphasize longer-term research consistent with the CCS and power Systems program. Key research areas that will be supported include, but are not limited to, advanced power systems including near-zero emission power plants; CCS; development of advanced high performance materials; harsh environment sensors and controls; and the development of advanced fossil based power generation systems. Funding will be used to conduct Fossil Energy research activities at these institutions and to support an HBCU/OMI annual technology transfer symposium. Grants awarded under this program are intended to maintain and upgrade educational, training and research capabilities of HBCUs/OMIs in the fields of science and technology related to fossil energy resources, with project results being used to further DOE's commitment to Fossil Energy research.

International Activities

Coal Technology Export

The Coal Technology Export element works with international organizations to facilitate export of U.S. climate technology and energy services to the developing world. The element engages multilateral organizations including the IEA, United Nations, WEC, and the Carbon Sequestration Leadership Forum while managing bilateral agreements with key countries such as China and India.

International Program Support

The International Program Support element supports FE's commitment to the International Energy Agency Clean Coal Center (IEACCC) to enhance the competitiveness and adoption of U.S. Clean Coal Technologies in targeted countries that will help protect the local and global environment. It will also preserve and enhance active relationships with national and international organizations by focusing on expanding cleaner energy technology power systems activities globally.

Benefits

Public Benefits

- Reduced cost of achieving carbon emissions reductions.
- Reduced time and cost of developing carbon capture and advanced power system technologies.
- Increased efficiency and reliability of power generation advanced fossil fuel systems through improved sensors and controls.

- Increased spillover benefits from technological innovations as a result of R&D.

Funding Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Pursued the development of new classes of sensors that are capable of monitoring key parameters in harsh environment conditions of fossil energy systems and expanded the utilization of sensors through the development of artificially intelligent sensor networks and advanced process control for near zero emission power plants, established a multi-laboratory NRAP focused on developing a science-based quantitative methodology for determining risk profiles (i.e., residual risk) at CO_2 storage sites, provided high-performance computational modeling and simulation research into advanced energy plants and CCS technology, and continued to support grants at U.S. colleges and universities by emphasizing longer-term research for achieving FE's strategic objectives.	47,946
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): Continue the development of 1st and 2nd generations of novel sensors, controls, advanced modeling and simulation, and high performance modeling technologies that contribute to a power systems' safe, efficient and environmentally benign operation. Work has started on new classes of transformational sensors. Existing sensors will be integrated into artificially intelligent sensor networks with self-organizing capabilities and increasingly used for advanced process control of near-zero emissions power plants. Model based process control for gasification and chemical looping processes will be demonstrated virtually.	
FY 2014	Continue development of 2nd generation and transformational sensors, controls and models with the deployment of developmentally ready temperature, and stress sensors to the turbines and gasification programs. NRAP will deploy the next generation of reservoir, groundwater, induced seismicity and atmosphere risk models.	20,525

NETL Coal Research and Development

Overview

The NETL staff is directly associated with conducting in-house research activities for the Coal Research and Development. This research supports NETL program specific activities in Carbon Capture, Carbon Storage, Advanced Energy Systems, and Cross Cutting Research. The in-house research and development activities are conducted by a staff of scientists, engineers, technicians and administrative personnel.

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
NETL Coal R&D Direct Program			
Salaries and Benefits	29,260	---	26,800
Travel	1,172	---	1,000
Support Services	4,579	---	7,211
Total, NETL Coal R&D Direct Program	35,011	35,225	35,011
Full Time Equivalents	213	---	195

Benefits

NETL in-house research supports program specific activities in Carbon Capture, Carbon Storage, Advanced Energy Systems, and Cross-cutting Research.

Funding Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	NETL in-house research activities for Coal Research and Development. This research supports program specific activities in Carbon Capture, Carbon Storage, Advanced Energy Systems, and Cross-cutting Research.	35,011
FY 2013	Planned activities in the FY 2013 Budget (final allocations have not yet been determined): NETL in-house research activities for Coal Research and Development. This research supports program specific activities in Carbon Capture, Carbon Storage, Advanced Energy Systems, and Cross-cutting Research.	35,225
FY 2014	NETL in-house research activities for Coal Research and Development. This research supports program specific activities in Carbon Capture, Carbon Storage, Advanced Energy Systems, and Cross-cutting Research.	35,011

Natural Gas Technologies
Funding Profile by Subprogram

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
Natural Gas Technologies			
Effective Environmental Protection	4,859	---	12,000
Gas Hydrates	9,716	---	5,000
Total, Natural Gas Technologies	14,575	15,083	17,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

*SBIR/STTR:

- FY 2012 Transferred: SBIR: $366; STTR: $49
- FY 2013 Annualized CR: SBIR $432: STTR: $56
- FY 2014 Request: SBIR $448: STTR: $64

Public Law Authorizations

Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 109–58, "Energy Policy Act of 2005"

Overview

The mission of the Natural Gas program is to support DOE missions in energy, environment, and national security.

The Natural Gas Technologies program was reprioritized to launch a collaborative research and development initiative together with the Environmental Protection Agency (EPA) and the Department of the Interior's U.S. Geological Survey (USGS) to understand and minimize the potential environmental, health, and safety impacts of natural gas development through hydraulic fracturing (fracking), consistent with the recommendations of the Secretary of Energy Advisory Board's (SEAB) August 2011 "Shale Gas Production Subcommittee Ninety-Day Report."

Subprogram Accomplishments and Milestones

In FY 2013, the budget invests in research and development to understand and minimize the potential environmental, health, and safety impacts of shale gas development.

The Program successfully completed a 30-day production test of an arctic well in 2012 providing large volumes of data available to the public for further evaluation.

In FY 2014, The Natural Gas program will focus on continued implementation of collaborative research plan in such areas as water quality, water availability, air quality, induced seismicity, and mitigating the impacts of development.

In FY 2014 the Natural Gas program intends to conduct lab- and/or field-based research focused on increasing public understanding of methane dynamics in gas-hydrate bearing areas. These public sector-led efforts will be designed to evaluate the occurrence, nature and behavior of naturally occurring gas hydrates and the resulting resource, hazard, and environmental implications.

Program Planning and Management

The Department Of Energy, Department of the Interior, and Environmental Protection Agency developed a focused, collaborative research effort to address high-priority challenges to safe and prudent development of unconventional resources. The primary goal of this multiagency research effort is to provide timely science and tools that support sound policy, allow for informed unconventional resource development decisions at many levels –federal, state, tribal, and local; industry; and the public, and to advance technologies that will maximize benefits to the Nation.

Major Outyear Priorities and Assumptions

The Natural Gas program will focus on continued implementation of a priority collaborative research and development initiative together with the EPA and DOI to ensure that hydraulic fracturing for natural gas development is conducted in a manner that is environmentally sound and protective of human health and safety.

Subprogram Goals and Funding

The Natural Gas Program goal is to conduct scientific assessments of shale gas exploration and production risk and develop mitigating technologies, and conduct lab- and/or field-based research to evaluate the occurrence, nature, and behavior of naturally occurring gas hydrates and the resulting resource, hazard, and environmental implications.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Effective Environmental Protection			
The increase in funding for Effective Environmental Protection (+$7M) is necessary to continue implementation of collaborative research including research on water quality and availability, air quality, induced seismicity, and mitigating the impacts of shale gas development.	4,859	12,000	+7,141
Gas Hydrates			
The decrease in funding for Gas Hydrates (-$4.7M) is a result of the program focusing on increasing public understanding of methane dynamics in gas-hydrate bearing areas. These public sector-led efforts will be designed to evaluate the occurrence, nature and behavior of naturally occurring gas hydrates and the resulting resource, hazard, and environmental implications.	9,716	5,000	-4,716
Total, Natural Gas	14,575	17,000	+2,425

Unconventional FE Technologies
Funding Profile

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Unconventional FE Technologies	4,859	5,027	0

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

*SBIR/STTR:

- FY 2012 Transferred: SBIR: $122; STTR: $16
- FY 2013 Annualized CR: SBIR: $128; STTR:$17

Public Law Authorizations

Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 109–58, "Energy Policy Act of 2005"

Overview

The mission of the Unconventional Fossil Energy Resource Program is to provide information and technologies that will assure sustainable, reliable, affordable, and environmentally sound supplies of domestic unconventional fossil energy resources.

Program Accomplishments and Milestones

No activity is proposed in FY 2014.

Program Planning and Management

No activity in FY 2014.

Program Goals and Funding

No activity in FY 2014.

Explanation of Funding AND/OR Program Changes

(Dollars in Thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Unconventional FE Technologies			
No activity is proposed in FY 2014.	4,859	0	-4,859
Total, Unconventional FE Technologies	4,859	0	-4,859

Program Direction
Funding Profile by Category

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Indirect Program Direction – Headquarters			
Salaries and Benefits	17,084	---	16,371
Travel	1,000	---	900
Support Services	85	---	85
Other Related Expenses	11,544	---	11,351
Total, Indirect Program Direction – Headquarters	29,713	---	28,707
Full Time Equivalents	110	---	104
NETL Indirect			
Salaries and Benefits	45,500	---	44,350
Travel	1,800	---	1,600
Support Services	21,751	---	20,528
Other Related Expenses	19,049	---	18,485
Total, NETL Indirect	88,100	---	84,963
Full Time Equivalents	360	---	346
Total Indirect Program Direction			
Salaries and Benefits	62,584	---	60,721
Travel	2,800	---	2,500
Support Services	21,836	---	20,613
Other Related Expenses	30,593	---	29,836
Total, Total Indirect Program Direction	117,813	---	113,670
Full Time Equivalents	470	---	450
Import/Export Authorization			
Salaries and Benefits	1,437	---	1,437
Travel	22	---	22
Other Related Expenses	657	---	624
Total, Import/Export Authorization	2,116	---	2,083
Full Time Equivalents	13	---	13
Total Program Direction			
Salaries and Benefits	64,021	---	62,158
Travel	2,822	---	2,522
Support Services	21,836	---	20,613
Other Related Expenses	31,250	---	30,460
Total, Total Program Direction	119,929	120,663	115,753
Total, Full Time Equivalents*	483	476	463

* Excludes FTEs under the NETL Direct R&D program

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Overview

Program Direction provides for the Headquarters and field Federal workforce responsible for the overall direction and administrative support of the FE program. To carry out FE's mission a federal staff is needed to provide program management and guidance, contract administration, and budget formulation and execution, etc. FE's primary mission is to ensure that the nation can continue to rely on traditional resources for clean, affordable energy while enhancing economic, environmental, and energy security. The mission of the program is to create technology and technology-based policy options for the public benefit. The program is also responsible for projects and reporting requirements related to American Recovery and Reinvestment Act (ARRA) activities. It also includes funding for the coordination of the Energy portfolio by the Office of the Under Secretary for Energy.

The Office of Import/Export Authorization manages the regulatory review of natural gas imports and exports. This program exercises regulatory oversight of the conversion of existing oil and gas-fired power plants, processes exemptions from the statutory provisions of the Power Plant and Industrial Fuel Use Act of 1978 (FUA), as amended, and processes certifications of alternate fuel capability.

Accomplishments and Strategic Inititatives

FE has been undergoing an effort on work force restructuring and optimization. Management optimization efforts have been put in place to meet government objectives of reducing costs for support service activities.

Major Program Shifts or Changes

Beginning in FY 2012, the NETL Coal R&D Direct Program Direction was moved out of Program Direction and is now a line titled NETL Coal R&D under the CCS and Power System area. Beginning in FY 2013, FTEs associated with ARRA activities are included under NETL Indirect.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Headquarters			
Salaries and Benefits			
The decrease reflects a change in FTE from (110) FY 2012 Current to (104) in FY 2014 Request.	17,084	16,371	-713
Travel			
The decrease in travel is due to the mandated travel reductions.	1,000	900	-100
Support Services			
No funding changes.	85	85	+0
Other Related Expenses			
The decrease reflects administrative cost savings to support the Accountable Government Initiative.	11,544	11,351	-193
Total, Indirect Program Direction – Headquarters	29,713	28,707	-1,006
NETL Indirect			
Salaries and Benefits			
The decrease reflects a change in FTEs from FY 2012 Current (360 FTEs) to FY 2014 Request (346 FTEs).	45,500	44,350	-1,150
Travel			
The decrease in travel is the result of mandated travel reductions.	1,800	1,600	-200
Support Services			
The decrease is the result of cost savings and monitoring of requested increases for the contractors.	21,751	20,528	-1,223

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Other Related Expenses			
The decrease is the result of decreases in facility services/operations and infrastructure.	19,049	18,485	-564
Total, NETL Indirect	88,100	84,963	-3,137

Support Services by Category

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Technical Support Services			
Feasibility of Design Considerations	0	0	+0
Development of Specifications	0	0	+0
System Definition	0	0	+0
System Review and Reliability Analysis	350	400	+50
Trade-Off Analysis	0	0	+0
Economic and Environmental Analysis	875	950	+75
Test and Environmental Studies	2,600	2,700	+100
Surveys or Reviews of Technical Operations	400	425	+25
Total, Technical Support Services	4,225	4,475	+250
Management Support Services			
Analysis of Workload and Workflow	0	0	+0
Directive Management Studies	650	650	+0
Automatic Data Processing	6,500	6,500	+0
Manpower Systems Analysis	0	0	+0
Preparation of Program Plans	0	0	+0
Training and Education	0	0	+0
Analysis of DOE Management Processes	0	0	+0
Reports and Analyses Management and General Administrative Support	10,461	8,988	-1,473
Total, Management Support Services	17,611	16,138	-1,473
Total, Support Services	21,836	20,613	-1,223

Other Related Expenses by Category

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Other Related Expenses			
Rent to GSA	0	0	+0
Rent to Others	1,700	1,800	+100
Communication, Utilities, Misc.	5,900	5,500	-400
Printing and Reproduction	30	30	+0
Other Services (Facility Operations, Technology	5,870	4,280	-1,590

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Infrastructure Support, etc.)			
Training	750	750	+0
Purchases from Gov. Accounts	1,800	1,800	+0
Operation and Maintenance of Equipment	3,200	2,800	-400
Supplies and Materials	2,200	2,200	+0
Equipment	2,400	2,000	-400
Working Capital Fund	7,400	9,300	+1,900
Total, Other Related Expenses	31,250	30,460	-790

Plant and Capital Equipment
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
Plant and Capital Equipment			
General Plant Projects	16,794	---	13,294
Total, Plant and Capital Equipment	16,794	16,897	13,294

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 108–153, "21st Century Nanotechnology Research and Development Act 2003"
Public Law 109–58, "Energy Policy Act of 2005"
Public Law 110–69, "America COMPETES Act of 2007"
Public Law 110-140, "Energy Independence and Security Act 2007"
Public Law 111–358, "America COMPETES Act of 2010"

Overview

The Plant and Capital Equipment program creates, improves, and maintains the 118 facilities and infrastructure making up the National Energy Technology laboratory (NETL). NETL has 118 facilities and related infrastructure located in Morgantown, West Virginia; Pittsburgh, Pennsylvania; and Albany, Oregon. These facilities directly support the development of clean technologies for fossil energy and are critical for supporting the R&D necessary to meet DOE program goals for cost effective and efficient CO_2 capture and sequestration technologies.

Program Accomplishments and Milestones

In FY 2014, execution of this program's mission will support the Secretary's climate change technology goals and energy usage reduction goals. Additionally, these funds will contribute to the Secretary's priority for clean energy and GPRA Unit Program Goals by maintaining and improving facilities and related infrastructure supporting performance of research to develop and deploy clean, safe, low-CO_2 emissions energy sources.

Milestone

- Conducting projects which will reduce energy, environmental, safety/health risks and liabilities posed by an aging infrastructure, to comply with building standards, and to meet the energy conservation and research requirements of Public Law 110-140, The Energy Independence and Security Act of 2007.

- Meet or exceed the energy conservation milestones for FY 2013 through energy efficiency improvements.

- Department Strategic Goal 5.3 – Infrastructure: Build, modernize, and maintain facilities and infrastructure to achieve mission goals and ensure a safe and secure workplace.

Program Planning and Management

The funding for the Plant and Capital Equipment subprogram in FY 2014 will be used to maintain and improve facilities and related infrastructure supporting performance to develop and deploy clean, safe, low-CO_2 emissions energy sources. In addition to supporting a safe infrastructure, FE sites are working to achieve a reduction in its energy consumption by up to 30 percent total reduction by the end of FY 2015.

Program Goals and Funding

- Provide an infrastructure that is compliant with safety, health and environmental regulations.
- Meet milestones established to comply with the 2015 energy savings requirements of P.L. 110-140.
- Meet the High Performance Sustainable Buildings goals established by the Secretary.

Specific goals include making substantial progress in the areas of:

- Energy saving
- Demonstrating new technologies
- Efficiency

Explanation of Funding AND/OR Program Changes

(Dollars in Thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
General Plant Projects			
The program has prioritized funding of projects that support compliance with all safety, health and environmental regulations.	16,794	13,294	-3,500
Total, General Plant Projects	16,794	13,294	-3,500

Environmental Restoration
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Environmental Restoration			
CERCLA[a] Remedial Actions	200	---	200
RCRA[b] Remedial Action	1,697	---	1,697
Other ES&H[c] Actions	6,000	---	4,000
Total, Environmental Restoration	7,897	7,945	5,897

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 108–153, "21st Century Nanotechnology Research and Development Act 2003"
Public Law 109–58, "Energy Policy Act of 2005"
Public Law 110–69, "America COMPETES Act of 2007"
Public Law 111–358, "America COMPETES Act of 2010"

Overview

FE Environmental Restoration activities ensure protection of workers, the public, and the environment in performing the FE mission of the NETL at the Morgantown, West Virginia; Pittsburgh, Pennsylvania; Houston, Texas; Fairbanks, Alaska; and Albany, Oregon sites.

Program Accomplishments and Milestones

In FY 2012, FE's CERCLA subprogram operated and maintained the air sparge remediation system at the Rock Springs Site to remove organic contaminants from the Tipton aquifer ground water, as required by the Wyoming Department of Environmental Quality (WDEQ). Periodic ground water sampling events at Sites 4, 6, 7, 9, and 12 were conducted to evaluate contaminant removal and to assess progress toward meeting regulatory requirements set forth by the WDEQ. A project review report, as required by the WDEQ, was prepared and submitted. Participants include: U.S. Army Corps of Engineers, HydroGeoLogic Consultants and URS (NETL site support contractor). The 2-year ground water stability period at the Hoe Creek III Site was successfully completed and the WDEQ determined that the aquifer was restored. A surface reclamation plan was successfully negotiated with the WDEQ. The wells and equipment have been decommissioned. Participants include: U.S. Army Corps of Engineers and Cape Environmental Associates.

In FY 2012, the RCRA subprogram implemented chemical- and pollutant-related environmental management plans under NETL's ISO-14001 program. It continued NETL RCRA-related on-site regulatory, corrective, preventive, and improvement activities, such as asbestos and lead abatement and waste minimization and pollution prevention activities; performed activities to ensure compliant wastewater treatment plant operations in order to address past notices of violations; and funded RCRA-related risk management and maintenance activities.

The NETL Albany site continued its RCRA cleanup actions, including: abating lead and asbestos exposures; resolving chemical storage issues; monitoring soil and ground water; upgrading ventilation and air pollution control systems; and improving air emission management, materials handling, facility equipment disposal, and waste disposal activities. Regulatory ground water monitoring activities continued in conjunction with the Oregon Department of Environmental Quality (ODEQ) as did the investigation and risk assessment activities for the specific trichloroethylene (TCE) ground water contamination issue.

The Other ES&H subprogram implemented and improved baseline regulatory compliance, integrated safety management, and ISO 14001 programs (i.e., emergency management, occupational medicine and health, industrial hygiene, safety, environmental management, ergonomics, training, security, and fire protection). It included; actions in support of correcting ES&H deficiencies associated with infrastructure (e.g., ventilation systems, waste pads, and gas cylinder storage areas); actions in support of achieving DOE's pollution prevention and energy management goals; maintaining indoor air quality and ventilations systems,

walking/working surfaces, personal protective equipment, and alarm infrastructure systems. The subprogram also included actions in support of personnel security, operational security, export/import controls, and the foreign national visitor and assignment programs.

Milestones

- The CERCLA subprogram plans to continue active operation and maintenance of the air sparge remediation system at the Rock Springs Sites 4, 6, 7, 9, and 12 in order to remove organic contaminants from the Tipton aquifer ground water. Upon conclusion of active groundwater water remediation, a groundwater stabilization period will be required. Periodic ground water sampling events will be conducted to evaluate contaminant removal and to assess progress toward meeting regulatory requirements set forth by the WDEQ. Regulatory agreements, as requested by the WDEQ, will be negotiated and the closure process will be completed. Disturbed areas will be contoured and seeded with seed mixtures approved by WDEQ. Participants include: U.S. Army Corps of Engineers, HydroGeoLogic Consultants and URS (NETL site support contractor).

- The RCRA subprogram plans to continue RCRA-related on-site regulatory, corrective, preventive, and improvement activities, such as asbestos and lead abatement and waste minimization and pollution prevention activities. It also will continue NETL Albany site RCRA cleanup actions, including; abating lead and asbestos exposures; resolving chemical storage issues; monitoring soil and ground water; upgrading ventilation and air pollution control systems; improving air emission management, materials handling, facility equipment disposal, and waste disposal activities. Regulatory ground water monitoring activities will continue in conjunction with the ODEQ and will include ongoing investigation and risk assessment activities for the specific trichloroethylene (TCE) ground water contamination issue.

- The Other ES&H subprogram will implement and improve baseline regulatory compliance, integrated safety management, and ISO 14001 programs (i.e., emergency management, occupational medicine and health, industrial hygiene, safety, environmental management, ergonomics, training, security, and fire protection). Actions will include; support for correcting ES&H deficiencies associated with infrastructure (e.g., ventilation systems, waste pads, and gas cylinder storage areas); support for achieving DOE's pollution prevention and energy management goals; maintaining indoor air quality and ventilations systems, walking/working surfaces, personal protective equipment, and alarm infrastructure systems; implementation of ergonomics corrective actions; and conducting site-specific ES&H training and emergency drills. It will also implement actions in support of personnel security, operational security, export/import controls, and the foreign national visitor and assignment programs.

Program Planning and Management

The funding for the CERCLA subprogram in FY 2014 will be used to continue active operation and maintenance of the air sparge remediation system at Rock Springs Sites 4, 6, 7, 9, and 12 as well as continue a 10-year surface revegetation at the Hoe Creek Site.

In FY 2014, The RCRA subprogram will continue RCRA-related on-site regulatory, corrective, preventive, and improvement activities, such as asbestos and lead abatement, waste minimization, and pollution prevention activities along with the NETL Albany site RCRA clean-up which includes: abating lead and asbestos exposures; resolving chemical storage issues; monitoring soil and ground water; upgrading ventilation and air pollution systems; improving air emission management, materials handling, facility equipment disposal, and waste disposal activities; regulatory ground water monitoring activities in conjunction with the Oregon Department of Environmental Quality (ODEQ) involving investigation; and risk assessment activities for the specific trichloroethylene (TCE) ground water contamination issue.

The Other ES&H subprogram will continue to implement and improve baseline regulatory compliance, integrated safety management, and ISO 14001 programs (i.e., emergency management, occupational medicine and health, industrial hygiene, safety, environmental management, ergonomics, training, security, and fire protection). This will include: actions in support of correcting ES&H deficiencies associated with infrastructure (e.g., ventilation systems, waste pads, and gas cylinder storage areas); actions in support of

achieving DOE's pollution prevention and energy management goals; and maintaining indoor air quality, ventilations systems, walking/working surfaces, personal protective equipment, and alarm infrastructure systems. It will also implement actions in support of personnel security, operational security, export/import controls, and the foreign national visitor and assignment programs.

Program Goals and Funding

Support actions and projects to correct or mitigate various ES&H deficiencies associated with the various infrastructure systems and processes across all NETL sites. Support actions and projects to realize DOE's pollution prevention and energy management goals. Meet NETL's RCRA obligations at all NETL sites.

Specific Goals:
Continuing upgrades of fire detection and alarm system and asbestos and lead paint abatement at NETL.
Investigation and assessment of risks associated with ground water contamination at NETL-Albany.
Operate and maintain remediation efforts at Rock Springs, WY site in accordance with Wyoming Department of Environmental Quality.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
CERCLA			
Continuing activities include groundwater remediation at Rock Springs and a 10-year revegetation effort at Hoe Creek. These activities will continue through the FY 2012-2014 timeframe. Increases in funding requirements are directly related to manpower support requirements for variable work involving air sparging activities at the Rock Springs sites.	200	200	0
RCRA			
Asbestos, lead abatement activities, and pollution prevention work at NETL continues to diminish. The only significant driver of costs in this activity remains the remediation of the groundwater contamination at the Albany site.	1,697	1,697	0
Other ES&H			
Concentrate on core ES&H activities while maintaining regulatory work with CERCLA and RCRA.	6,000	4,000	-2,000
TOTAL Funding Change, Environmental Restoration	7,897	5,897	-2,000

Special Recruitment Programs
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Special Recruitment Programs			
Special Recruitment Programs	700	---	700
Total, Special Recruitment Programs	700	704	700

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 108–153, "21st Century Nanotechnology Research and Development Act 2003"
Public Law 109–58, "Energy Policy Act of 2005"
Public Law 110–69, "America COMPETES Act of 2007"
Public Law 111–358, "America COMPETES Act of 2010"

Overview

The Office of Fossil Energy (FE) developed the Mickey Leland Energy Fellowship (MLEF) Program to provide students majoring in science, technology, engineering and mathematics disciplines the opportunity to enhance their education and knowledge of fossil fuels. The goal of the program is to support an increase in the number of females and under-represented minorities entering the scientific and engineering career fields within the U.S. workforce.

The MLEF program is a ten-week summer internship program that offers students in science, technology, engineering and mathematic disciplines the opportunity to learn about the programs and initiatives within the Office of Fossil Energy and the challenges in providing clean, affordable energy for future generations.

Program Accomplishments and Milestones

The Special Recruitment Program supports the Secretary's Priority of developing and nurturing science and engineering talent in order to provide a succession of scientists and engineers.

In FY 2014, a diverse group of undergraduate, graduate, and Ph.D. students in science, technology, engineering and mathematic majors will be recruited and selected to participate in the MLEF program.

Program Planning and Management

The funding for the Special Recruitment Programs subprogram in FY 2014 will be used to recruit applicants from colleges and universities to participate in the MLEF program.

Program Goals and Funding

In FY 2014, a diverse group of undergraduate, graduate, and Ph.D. students in science, technology, engineering and mathematic majors will be recruited and selected to participate in the MLEF program.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Special Recruitment Programs			
No change.	700	700	0
Total, Special Recruitment Programs	700	700	0

Naval Petroleum and Oil Shale Reserves

Naval Petroleum and Oil Shale Reserves

Naval Petroleum and Oil Shale Reserves
Proposed Appropriation Language

For expenses necessary to carry out naval petroleum reserve and oil shale reserve activities, $20,000,000 to remain available until expended: Provided, That, notwithstanding any other provision of law, unobligated funds remaining from prior years shall be available for all naval petroleum and oil shale reserve activities.

Explanation of Change

No changes.

Naval Petroleum and Oil Shale Reserves
Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Naval Petroleum and Oil Shale Reserves			
Naval Petroleum and Oil Shale Reserves	14,909	15,000	20,000
Total, Naval Petroleum and Oil Shale Reserves	14,909	15,000	20,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Office Overview and Accomplishments

NPR-1—Environmental remediation and cultural resource activities are required by legal agreements between DOE, Occidental, Chevron, and the California Department of Toxic Substances Control (DTSC) that were executed to fulfill the requirement in P.L. 104-106 to sell the government's interests in NPR-1. Current activities encompass execution of a technical baseline, interim measures, environmental sampling and analysis, corrective measures, waste removal and disposal, confirmatory sampling, and requests for release from further corrective action.

NPR-2—Disposal of eight 2-acre parcels of unused land on NPR-2 (the "Ford City Drill Sites") was authorized by the Energy Security Act of 2005. In FY 2012 the last of the eight sites was transferred to GSA for disposal.

NPR-3 will begin implementing the disposition plan with final disposition of the property estimated to occur in FY 2015. NPR-3 will be utilized for production and testing operations in order to retain asset value during preparation to transfer to new ownership. Production facilities will remain operational per the *Authorization of Continued Production of the Naval Petroleum Reserves beyond April 5, 2012 ,* submitted to Congress by the President in November 2011. The program will continue RMOTC testing for 100 percent funds-in projects. Environmental remediation of NPR-3 facilities will continue to facilitate the sale/disposition of the property in a manner consistent with an approved property sale/disposition plan.

Alignment to Strategic Plan

Under the Department's Strategic Goal, Transform Our Energy Systems, NPOSR Program provides for meeting the legal agreements involving NPR-1 environmental cleanup including payment for post-employment medical and dental benefits to former NPR-1 M&O contractor employees, and for NPR-3 Oil Field Operation & Divestiture.

Explanation of Changes

An increase of $5 million over the enacted FY 2012 is associated with accelerating environmental remediation responsibilities of NPR-1 to be responsive to the landowner development plan and meet compliance requirements of the California Department of Toxic Substances Control (DTSC).

Facilities Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. Facilities Maintenance and Repair activities funded by this budget are displayed below.

Costs for Direct-Funded Maintenance and Repair (including Deferred Maintenance)

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
Naval Petroleum and Oil Shale Reserves	1,370	---	490
Total, Direct-Funded Maintenance and Repair	1,370	---	490

Naval Petroleum and Oil Shale Reserves
Fossil Energy
Funding by Site by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Naval Petroleum and Oil Shale Reserves			
NPR Wyoming	9,179	---	9,200
Washington Headquarters	5,730	---	10,800
Total, Naval Petroleum and Oil Shale Reserves	14,909	15,000	20,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Naval Petroleum and Oil Shale Reserves
Funding Profile by Subprogram

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Naval Petroleum and Oil Shale Reserves			
Production Operations	5,480	---	13,000
Management	9,429	---	7,000
Total, Naval Petroleum and Oil Shale Reserves	14,909	15,000	20,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 94–258, "Naval Petroleum Reserves Production Act", 1976
Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 109–58, "Energy Policy Act of 2005"
Public Law 104–106, "The National Defense Authorization Act For Fiscal Year 1996"
Public Law 105–261, "The Strom Thurmond National Defense Authorization Act for Fiscal Year 1999"

Overview

The NPOSR program manages a number of legal agreements that were executed as part of the 1998 sale of NPR-1 in California. These agreements direct post-sale work including environmental restoration and remediation, equity finalization, contract closeout, and records disposition. Legal agreements include payment for post-employment medical and dental benefits to former Management & Operating (M&O) contractor employees. The NPR-1 program continues to work towards closing out the remaining environmental findings, as required by the 2008 agreement between DOE and the California DTSC.

DOE also operates NPR-3 and RMOTC, co-located near Casper, Wyoming. NPR-3/RMOTC will begin implementing a disposition plan with final disposition of the property estimated to occur in FY 2015. The site facilities will be utilized by production and testing operations in order to maintain asset value during preparation to transfer to new ownership. Production facilities will remain operational per the *Authorization of Continued Production of the Naval Petroleum Reserves beyond April 5, 2012 ,* submitted to Congress by the President in November 2011.. Operating the NPR-3 site will be done in a safe manner in accordance with environmental regulations. Production of 137 barrels of oil per day is forecast generating $4.2M deposited into the U.S. Treasury. Wells will be maintained to support continued production, but major breakdown of equipment will not be repaired or replaced. Infrastructure will not be removed for facilities that could be utilized to attract new owners.

RMOTC will provide opportunities through 100 percent funds-in agreements to academia, industry, and small inventors for field testing of oilfield technologies and demonstration of renewable energy technologies having oilfield application in order to assist in bringing them to the market place.

Environmental remediation of NPR-3 facilities will continue to facilitate the sale/disposition of the property in a manner consistent with an approved property sale/disposition plan. Remediation activities will continue for facilities that are not environmentally in compliance with the State of Wyoming Oil and Gas Commission (WOGCC) regulations, have mechanical issues, or no longer hold value for production operations, testing operations, or for new owners.

Subprogram Accomplishments and Milestones

On April 22, 2011, DOE settled its Equity Finalization process with Chevron. Under the settlement agreement Chevron has paid $108,000,000 to the Department. Significant progress was made in FY 2012 on the identification and remediation of environmental contamination at the former NPR-1. Disposal of the last of the eight Ford City Drill Sites on NPR-2 was also completed.

Milestone	Date
Current conditions and proposed paths to closure for 100 AOCs at NPR-1 submitted to DTSC.	FY 2012
DTSC completed review of proposed paths to closure for 72 AOCs at NPR-1	FY 2012
DTSC approved No Further Action for 9 AOCs at NPR-1	July 2012
Complete environmental remediation of Ford City Drill Site 26 at NPR-2	June 2012
Acceptance by GSA of Drill Site (NPR-2) 26 as surplus property for disposal	July 2012

NPR-3 outyear milestones will be dependent upon agreed to options of an approved disposition plan to be completed with implementation beginning in FY 2013. Complete environmental cleanup obligations that are required from the sale/transfer agreement(s) by the end of FY 2014. Completed transfer of property will occur in FY 2015 along with the closeout of the DOE RMOTC office and records disposition.

Program Planning and Management

NPOSR manages operational measures that are implemented by support service contractors. Action plans are reviewed and analyzed at Program Reviews held at NPR-1 and NPR-3. These reviews provide an opportunity to discuss performance, cost, schedule, and scope to ensure activities are on-track and within budget. Budget formulation/execution assessments are regularly conducted throughout the year to ensure that budget execution is on target.

Strategic Management

NPOSR activities directly support the Department's strategy for the development of fossil energy resources in an environmentally responsible manner through the continuation of environmental remediation projects at the former NPR-1.

Restructuring activities at NPR-3 will include implementing a disposition plan for possible sale or transfer of the site. Two external factors present the strongest impacts to the overall achievement of the program's strategic goal:

- Identifying new ownership for the property; and
- Having the required environmental remediation completed for disposition and/or sale that would be in the best interest of the government.

Subprogram Goals and Funding

The FY 2014 request provides an increase in funding for the acceleration of NPR-1 environmental remediation.

NPR-3 funding will be used for maintenance of wells and infrastructure required to maintain the value of the field for disposition. Complete mechanical integrity tests of all idle wells and plug and abandon any wells that pose a risk to the environment and/or have no potential value to a new owner. Conduct a rigorous Oil and Gas Reserves Evaluation including preparing an oil reserve upside report that provides information on potential untapped oil reserves to potential buyers to maximize sales price. Obtain regulatory oversight and/or approval from the State of Wyoming on any activities or facilities under their jurisdiction that may require further remediation, including closeout permits as needed. Dispose of U.S. Government personal property.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Production and Operations			
The increase is due to accelerating the cleanup of NPR-1 remediation responsibilities.	5,480	13,000	+7,520
Management			
The decrease is due to reduction in federal staffing due to attrition and management directed reassignments for the RMOTC office.	9,429	7,000	-2,429
Total, Naval Petroleum and Oil Shale Reserves	14,909	20,000	+5,091

Benefits

- Reduced environmental liabilities from the legacy of Federal oil resrve production.

Operations and Production
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
NPOSR - Operations and Production			
NPR-1 Closeout	2,480	---	8,827
NPR-3 Disposition	0	---	4,173
NPR-3 Environmental Remediation	3,000	---	0
Total, NPOSR – Operations and Production	5,480	---	13,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 94–258, "Naval Petroleum Reserves Production Act", 1976
Public Law 95–91, "Department of Energy Organization Act", 1977
Public Law 109–58, "Energy Policy Act of 2005"
Public Law 104–106, "The National Defense Authorization Act For Fiscal Year 1996"
Public Law 105–261, "The Strom Thurmond National Defense Authorization Act for Fiscal Year 1999"

Overview

NPR-1 environmental remediation and cultural resource activities are required as a result of the former NPR-1 sales agreement of 1998. The commitments were formalized in legal agreements between DOE, Occidental, Chevron, and the State of California.

NPR-3 program operates as a stripper field that produces oil and deposits revenue into the U.S. Treasury. It also utilizes the site as a testing facility for RMOTC that allows field testing of oilfield technologies, as well as renewable energy applications as related to oilfield application.

In maximizing the benefits of disposition and remediation of NPR-3, work must be done to address the following challenges:

- Ability to maintain facilities to optimal level of usage and conditioning to attract new owners
- Providing a site to assist bringing innovations to market
- Generate net-revenue for the U.S. Treasury

Program Accomplishments and Milestones

On April 22, 2011, DOE settled its Equity Finalization process with Chevron. Under the settlement agreement Chevron has paid $108 million to the Department. Significant progress was made in FY 2012 on the identification and remediation of environmental contamination at the former NPR-1. Disposal of the last of the eight Ford City Drill Sites on NPR-2 was also completed.

NPR-3 continued profitable production operations providing revenue to the U.S. Treasury. NPR-3 outyear milestones will be dependent upon agreed to options of approved disposition plan. Complete environmental cleanup obligations will be required from the sale/transfer agreement(s) by the end of FY 2014. Completion of the transfer of the property will occur by the end of FY 2015. And finally, the closeout of DOE RMOTC office and records disposition will be completed in FY 2016. NPR-3/RMOTC will begin implementing the disposition plan, with final disposition of the property estimated to occur in FY 2015.

Program Planning and Management

(Refer to applicable sections shown previously)

Strategic Management

(Refer to applicable sections shown previously)

Subprogram Goals and Funding

(Refer to applicable sections shown previously)

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
NPR-1 Closeout			
The increase is due to an accelarated focus on environmental remediation at NPR-1.	2,480	8,827	+6,347
Disposition			
The increase is due to transitioning from production, testing, and environmental remediation to disposition of the field. NPR-3 will implement the approved disposition plan that will transfer or sell the site while maintaining and operating assets that provide value to new ownership.	0	4,173	+4,173
NPR-3 Environmental Remediation			
The Environmental Remediation activities will be done under disposition.	3,000	0	-3,000
Total, NPOSR – Operations and Production	5,480	13,000	+7,520

Naval Petroleum and Oil Shale Reserves

Program Direction
Funding Profile by Category

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR	FY 2014 Request
NPR - Wyoming			
Salary & Benefits	2,315	---	1,285
Travel	100	---	70
Support Services	0	---	0
Other Related Expenses	780	---	552
Business Management & Support	2,984	---	3,120
Total, NPR - Wyoming	6,179	---	5,027
Full Time Equivalents	14		8
Washington, Headquarters			
Salary & Benefits	1,080	---	700
Travel	50	---	50
Support Services	75	---	275
Other Related Expenses	45	---	45
Equity	1,000	---	0
Bechtel Medical/Dental	1,000	---	903
Total, Washington, Headquarters	3,250	---	1,973
Full Time Equivalents	6		4
Total Program Direction			
Salaries & Benefits	3,395	---	1,985
Travel	150	---	120
Support Services	75	---	275
Other Related Expenses	825	---	597
Equity	1,000	---	0
Bechtel Medical/Dental	1,000	---	903
Business Management & Support	2,984	---	3,120
Total, Total Program Direction	9,429	---	7,000
Full Time Equivalents	20		12

Overview

Program Direction provides the Federal staffing resources and associated costs required to provide overall direction and execution of the NPOSR. There are a variety of functions that are inherently governmental (e.g., program management, contract administration, budget formulation and execution that require a dedicated Federal workforce.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Salaries and Benefits			
Decrease is due to attrition, management directed reassignments at NPR-3 implemented in FY 2012, and relocation of key position to the RMOTC site in FY 2012.	3,395	1,985	-1,410
Travel			
Decrease is due to implementation of disposition plan for NPR-3 and the increase of televideo conferencing.	150	120	-30
Support Services	75	275	+200
Increase is due to the increase in Records Management			
Other Related Expenses			
Decrease is due to decrease in Other Services.	825	597	-228
Business Management & Support			
Increase is due to support in disposition of site.	2,984	3,120	+136
Bechtel Medical/Dental			
Decrease is due to lower number of participants in the insurance program.	1,000	903	-97
Equity			
DOE settled its Equity Finalization process with Chevron on April 22, 2011	1,000	0	-1000
Total Funding Change, Program Direction	9,429	7,000	-2429

Support Services by Category

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Support Services	75	275	+200
Total, Support Services	75	275	+200

Other Related Expenses by Category

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Other Related Expenses			
Rent to Others	450	206	-244
Communication, Utilities, Misc	100	160	+60
Other Services	205	169	-36
Operations and Maintenance of Equipment	5	15	+10
Supplies and Materials	65	47	-18
Total, Other Related Expenses	825	597	-228

Strategic Petroleum Reserve

Strategic Petroleum Reserve

Strategic Petroleum Reserve
Proposed Appropriation Language

For necessary expenses for Strategic Petroleum Reserve facility development and operations and program management activities pursuant to the Energy Policy and Conservation Act of 1975, as amended (42 U.S.C. 6201 et seq.), $189,400,000, to remain available until expended.

Explanation of Changes

No changes.

Strategic Petroleum Reserve
Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Strategic Petroleum Reserve			
Strategic Petroleum Reserve	192,704	193,883	189,400
Total, Strategic Petroleum Reserve	192,704	193,883	189,400

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Office Overview and Accomplishments

The Strategic Petroleum Reserve (SPR) protects the U.S. from disruptions in critical petroleum supplies and meets the U.S. obligations under the International Energy Program (Energy Policy and Conservation Act, P.L. 94-163, as amended, Section 151). The mission of the SPR achieves the Secretary's Goal of Security: Protecting the Nation against interruptions in its critical petroleum supplies.

Within the SPR Appropriation, the SPR program funds Facilities Development, Operations (Security, Power, Operations and Maintenance, and Support Services), and Management of the SPR.

In FY 2011, the SPR executed a presidentially ordered SPR drawdown of 30 million barrels as the U.S. obligation under the International Energy Agency Libya Collective Action, which reduced the crude oil inventory from 727 million barrels to 696 million barrels. In FY 2012, the SPR maintained an emergency petroleum stockpile with the readiness and capability to respond to U.S. oil supply emergencies. SPR also completed the replacement of an existing storage cavern at its Bayou Choctaw site that posed a major environmental risk.

The SPR's oil inventory of 696 million barrels in FY 2012 provides approximately 93 days of net oil import protection. The unavailability of 60 million barrels for emergency use due to termination of SPR's oil degasification project in FY 2011 has resulted in an 8 day reduction in SPR's import protection level. The degasification plant was scheduled to be moved in 2011 to commence crude degasification activities at West Hackberry site in FY 2012. The FY 2011 rescission ($15.3M) took funding needed to move the plant, which terminated SPR crude degasification activities, thereby reducing availability of SPR stocks for drawdown. The crude inventory stored in the SPR must be periodically processed through a degasification plant in order to maintain a safe crude oil vapor pressure compliant with federal and state regulations. If the 2013 Budget request is enacted by Congress funding to move the degasification plant from Bryan Mound to West Hackberry site will be provided. The planned FY 2014 restart of degasification operations at West Hackberry site will begin processing SPR stocks, requiring approximately 2 years for the entire inventory to be available for emergency use.

Alignment to Strategic Plan

Under the Department's Strategic Goal, *Transform Our Energy Systems*, the SPR provides an emergency stockpile of petroleum to protect the United States against petroleum supply disruptions by domestic and international events.

Explanation of Changes

The Request is $189.4 million for the SPR in FY 2014, which is a 2 percent decrease from the FY 2012 Current Request of $192.7 million.

The FY 2014 request provides continuation of the Casing Inspection and Remediation Program to address cavern integrity at all sites and prevent potential environmental contamination. This request also supports degasification of crude oil using one degas plant. The plant begins processing oil at West Hackberry in February 2014 and continues through December 2018. The base program for SPR operation, maintenance and security includes annual System Test and Recovery Program Exercises, as well as preventive, predictive and corrective maintenance and major maintenance activities to ensure efficient operating conditions of all sites.

The FY 2014 request decreases funding in Security (-$1.0M) due to 10 fewer rover positions and reduces the Power budget (-$1.9M) to reflect efficiencies realized in contract renewals. Decreased funding from completion of the new Bayou Choctaw Cavern 102 development is offset by increased cavern remediation activities (-$3.6M). Requirements for Support Services have increased slightly (+$0.4M) for additional technical support and Management (+$2.9M) requires increased funding for federal staffing, evacuation planning and updates to intra-site communication services.

Facilities Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. Facilities Maintenance and Repair activities funded by this budget are displayed below.

Costs for Direct-Funded Maintenance and Repair (including Deferred Maintenance)

(dollars in thousands)

	FY 2012 Actual Cost	FY 2012 Planned Cost	FY 2013 Planned Cost	FY 2014 Planned Cost
Strategic Petroleum Reserve	37,134	33,133	35,208	41,142
Total, Direct-Funded Maintenance and Repair	37,134	33,133	35,208	41,142

Total Costs for Maintenance and Repair

(dollars in thousands)

	FY 2012 Actual Cost	FY 2012 Planned Cost
Strategic Petroleum Reserve	37,134	33,133
Total, Costs for Maintenance and Repair	37,134	33,133

The SPR exceeded the planned funding for maintenance and repair activities due to emergency repair of a Big Hill transformer, unplanned replacement of PIV 20 at Bryan Mound, and emergency repair of firewater pipe leak at Bryan Mound. Additionally, the rework of pipeline valves at Bryan Mound and Bayou Choctaw was accelerated from FY 2013 to FY 2012.

Strategic Petroleum Reserve
Fossil Energy
Funding by Site by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Strategic Petroleum Reserve			
Bayou Choctaw Site, LA	11,425	---	16,940
Big Hill Site, TX	20,968	---	17,651
Bryan Mound Site, TX	16,925	---	16,091
National Energy Technology Laboratory	1,415	---	243
Oak Ridge National Laboratory	390	---	400
Sandia National laboratory	3,342	---	3,260
SPR Program Management Office, DC	5,987	---	6,942
SPR Project Management Office, LA	111,183	---	101,584
West Hackberry Site, LA	21,069	---	26,289
Total, Strategic Petroleum Reserve	192,704	193,883	189,400

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Strategic Petroleum Reserve
Funding Profile by Subprogram

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Strategic Petroleum Reserve			
Facilities Development and Operations	170,914	---	164,741
Management	21,790	---	24,659
Total, Program Name	192,704	193,883	189,400

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 109–58, "Energy Policy Act of 2005"

Overview

The SPR protects the U.S. from disruptions in critical petroleum supplies and meets the U.S. obligations under the International Energy Program (Energy Policy and Conservation Act, Section 151). SPR also includes Defense Department crude oil, stored for national defense purposes.

The SPR benefits the Nation by providing an insurance policy against potential interruptions in U.S. petroleum supplies whether originating from international supply problems, hurricanes, accidents or terrorist activities.

In FY 2011, the SPR completed sale of 30.6 million barrels of crude oil its obligation under the International Energy Agency (IEA) Libya Collective Action. The FY 2011 sale reduced the crude oil inventory from 727 million barrels to 696 million barrels. The U.S. imports close to 50% of its petroleum supplies; the impact of a disruption in these supplies could be significant on the Nation and the national economy without an emergency response capability. The SPR serves as a deterrent to hostile threats of cutoffs of petroleum supplies. The SPR, with currently available crude oil stocks equal to approximately 93 days of imports in underground storage, provides a strong deterrent to hostile efforts. A release of petroleum from the SPR can mitigate the potential economic damage of an actual disruption in international or domestic petroleum supplies and the accompanying severe price increases. The SPR avails the United States of worldwide emergency assistance through its IEA participation. IEA members are required to maintain 90 days of strategic stocks and participate with other stockholding nations in a coordinated release of stocks in the event of a major supply disruption.

To accomplish its mission and address the challenges outlined above, the SPR program is organized into two subprograms: Facilities Development and Operations and Management. The Facilities Development and Operations subprogram funds all requirements associated with developing and maintaining facilities for the storage of petroleum, operations activities associated with placing petroleum into storage, and operational readiness initiatives associated with drawing down and distributing the inventory within 11-15 day's notice in the event of an emergency. The Management subprogram funds personnel and administrative expenses related to maintaining the Project Management Office (New Orleans, LA) and the Program Office (Washington, DC), as well as contract services required to support management and the technical analysis of program initiatives and issues.

Subprogram Accomplishments and Milestones

In FY 2012, the SPR maintained an emergency petroleum stockpile of 696 million barrels (with an unavailable inventory of 60 million barrels) and a drawdown capability of 4.25 million barrels per day to respond to U.S. oil supply emergencies. In October 2012, the SPR completed its cavern replacement project to provide a new cavern to replace an existing problem cavern at its Bayou Choctaw site.

In FY 2013, the Program is planning to monitor petroleum markets prior to any decision to refill SPR oil sold during the IEA coordinated release. Market monitoring is planned to continue during FY 2014. Also in 2013, the SPR plans to initiate the relocation of the degasification plant to the West Hackberry site and continue critical activities for its cavern casing inspection and remediation programs.

In FY 2014, the SPR is working towards the following key milestones:

Milestone	Date
Begin degasification operations at the West Hackberry site	February 2014

Program Planning and Management

There is a hierarchy of performance information for the SPR. The Department collects and tracks the executive-level "corporate" measures. The SPR Program Office monitors the "critical few," specific short- and long-term measures. The SPR Project Management Office manages the detailed, operational measures that are implemented by the contractors. Organizational and action plans are reviewed and analyzed at quarterly Program Reviews. Project Reviews/Assessments, including dashboard updates, are conducted monthly to analyze performance against all milestones and contracts. These reviews provide an opportunity to discuss performance and provide direction to contractors. These same measures are reviewed daily during the site managers' site status meetings.

Budget formulation/execution assessments are regularly conducted throughout the year, including periodic financial performance reviews and annual budget validations. Other evaluations include: semi-annual Management & Operating (M&O) contractor award fee performance assessments against Work Authorization Directives; on-site reviews to verify operational, maintenance and management performance data; and drawdown readiness quarterly reviews.

Strategic Management

The SPR will use various means and strategies to continue its mission and achieve program goals. Assurance of a readiness posture will be accomplished through internal readiness reviews, assessments, exercises, and tests. Effectiveness of the SPR to mitigate severe oil supply disruptions will be influenced by the SPR's size (inventory and capacity) and ability to deliver into the marketplace. In FY 2009, DOE used available balances for the purchase of additional SPR oil, and continued to fill using Federal royalty oil until a 727 million barrel inventory was achieved in December 2009. In FY 2011, the SPR completed a sale of 30.6 million barrels of crude oil as part of the International Energy Agency (IEA) emergency release. The program continues to monitor market conditions prior to future refill of the SPR oil sold during 2011 IEA coordinated release.

The SPR utilizes a transportable degas plant to ensure availability of crude oil inventories at SPR sites within environmental and safety constraints. This process prevents the off-gassing of volatile organic compounds (VOCs) above safe levels during oil movements through commercial distribution points. Inventory processing at Big Hill was completed in FY 2006, and the self-contained degas plant was relocated to Bryan Mound in FY 2007. When Bryan Mound degas operations were completed in FY 2011, the plant was scheduled to move to the West Hackberry site. Due to an FY 2011 Continuing Resolution Rescission, the SPR did not have sufficient funding for the required relocation and operations of its crude degasification plant. During FY 2013 the degasification plant will be moved from the Bryan Mound to West Hackberry site. Planned FY 2014 resumption of degasification operations at West Hackberry site will begin process of treating oil to safe vapor pressure levels so it is once again available for emergency use.

SPR's underground storage caverns require maintenance to assure their storage capability and integrity. SPR maintains a cavern casing inspection and remediation program to comply with the state of Texas' regulations and mitigate the risk of potential casing leaks and environmental damage.

In FY 2014, the continuation of a damaged internal floating roof on a tank at Bryan Mound site leaves the maximum site drawdown rate at a reduced 150,000 barrels per day. This reduction also diminishes the overall maximum SPR drawdown rate to 4.2 million barrels per day versus 4.4 million barrels per day.

Program performance can be affected by several external factors including:

- Changing U.S. petroleum consumption and import dependence levels
- Petroleum market conditions, and
- Developments in the commercial distribution system (i.e., pipelines, and terminals)

Subprogram Goals and Funding

Maintain an SPR with a readiness and capability to respond quickly and effectively to potential disruptions in U.S. petroleum supplies (foreign or domestic). The FY 2014 request provides for the management, operations, maintenance, and security of the Government's four SPR storage sites and maintains SPR readiness and capability to respond to U.S. oil supply emergencies. SPR will:

Continue a cavern casing Inspection and remediation program to address corrosion, cracks and deformations in wellhead components and casing per state regulations; resume degas operations to bring SPR oil inventory to a safe vapor pressure available for emergency use; and fund a major maintenance program that includes rework of crude oil pipeline valves at West Hackberry.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Facilities Development and Operations.			
Fewer rover positions in the Protective Force contract and decreased funding due to the completion of the new Bayou Choctaw Cavern 102 development and increased cavern remediation activities.	170,914	164,741	-6,173
Management			
Increased staffing requirements (re-federalization), contingency for hurricane evacuation expenses, and updating teleconferencing capabilities between the field Project Management Office and the four storage sites.	21,790	24,659	+2,869
Total, Strategic Petroleum Reserve	192,704	189,400	-3,304

Strategic Petroleum Reserve
Funding Profile by Subprogram and Activities

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Facilities Development and Operations			
Security	20,895	---	19,889
Power	4,516	---	2,947
Operations and Maintenance	142,125	---	138,125
Support Services	3,378	---	3,780
Total, Facilities Development and Operations	170,914	---	164,741

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 109-58, "Energy Policy Act of 2005"

Overview

In supporting the Secretary's Goal of *Security*, the SPR provides an emergency stockpile of petroleum to protect the United States against petroleum supply disruptions by domestic and international events.

The Facilities Development and Operations subprogram provides funding for protection from supply disruptions. The U.S. reliance on petroleum combined with location of significant global reserves in regions of the world subject to political unrest have made the U.S. vulnerable to supply disruptions.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Facilities Development and Operations			
Security	20,895	19,889	-1,006
Reduction in follow-on Protective Force contract with reduction of 10 rover positions.			
Power	4,516	2,947	-1,569
Efficiencies in the Bryan Mound storage site follow-on power contract renewal.			
Operations and Maintenance	142,125	138,125	-4,000
Reduction reflects completion of BC 102 in FY 2012 and increased cavern remediation activities in FY 2014.			
Support Services	3,378	3,780	+402
Inflation plus new requirements-based contract.			
Total, Facilities Development and Operations	170,914	164,741	-6,173

Strategic Petroleum Reserve
Program Direction
Funding Profile by Category

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Washington Headquarters			
Salary & Benefits	3,913	---	4,370
Travel	194	---	160
Support Services	1,430	---	2,020
Other Related Expenses	840	---	792
Total, Headquarters	6,377	---	7,342
Full Time Equivalents	27	---	28
Strategic Petroleum Reserve Project Management Office			
Salary & Benefits	13,184	---	13,538
Travel	668	---	485
Support Services	0	---	0
Other Related Expenses	1,561	---	3,294
Total, Strategic Petroleum Reserve Project Management Office	15,413	---	17,317
Full Time Equivalents	95	---	95
Total Program Direction			
Salary & Benefits	17,097	---	17,908
Travel	862	---	645
Support Services	1,430	---	2,020
Other Related Expenses	2,401	---	4,086
Total, Headquarters	21,790	---	24,659
Full Time Equivalents	122	---	123

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 109–58, "Energy Policy Act of 2005"

Overview

Program Direction provides Federal staffing and associated costs required to provide overall direction and execution of the SPR. The SPR mission is carried out by a workforce composed largely of M&O contractors, although there are a variety of functions that are inherently governmental (e.g., program management, contract administration, budget formulation and execution, and interagency and international coordination) that require a dedicated Federal workforce.

Accomplishments and Strategic Initiatives

In FY 2012, the SPR maintained an emergency petroleum stockpile of 696 million barrels (with an unavailable inventory of 60 million barrels) and a drawdown capability of 4.25 million barrels per day to respond to U.S. oil supply emergencies. In October 2012, the SPR completed its cavern replacement project to provide a new cavern to replace an existing problem cavern at its Bayou Choctaw site.

In FY 2013, the Program is planning to monitor petroleum markets prior to any decision to refill SPR oil sold during the IEA coordinated release. Market monitoring is planned to be continued during FY 2014. Also in 2013, the SPR plans to initiate the relocation of the degasification plant to the West Hackberry site and continue critical activities for its cavern casing inspection and remediation programs.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Salaries and Benefits			
The increase in Salaries and Benefits is attributable to escalation of salaries, step increases, and training for critical new hires (re-federalization) and relocation expenses.	17,097	17,908	+811
Travel			
The decrease in travel is part of the DOE initiative to increase Intra-site teleconferencing.	862	645	-217
Support Services			
The increase is attributable to project-planning efforts and escalation associated with service support contracts to maintain technical, mission essential support capabilities.	1,430	2,020	+590
Other Related Expenses			
The increase is due to the contingency for DOE employee evacuation expenses in the event of a hurricane and updating teleconferencing capabilities between the Project Management Office and the four sites (supports the initiative to decrease travel).	2,401	4,086	+1,685
Total Funding Change, Program Direction	21,790	24,659	2,869

Support Services by Category

(dollars in thousands)

	FY 2013 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Support Services			
Technical Support Services Economic and Environmental Analysis	1,430	2,020	+590
Total, Support Services	1,430	2,020	+590

Other Related Expenses by Category

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Other Related Expenses			
Rent to Others	522	566	+44
Communications, Utilities, Misc	100	100	0
Other Services	1,367	2,262	+895
Supplies and Materials	137	626	+489
Equipment	145	392	+247
DOE/COE	130	140	+10
Total, Other Related Expenses	2,401	4,086	+1,685

Supporting Information

Capital Operating Expenses

Capital Operating Expenses Summary

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Capital Equipment > $500K (including Major Items of Equipment (MIE))	12,451	---	13,366
Total, Capital Operating Expenses	12,451	---	13,366

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Capital Equipment > $500K (including MIE)

(dollars in thousands)

	Total	Prior Years	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Total Non-MIE Capital Equipment (>$500K)	n/a	n/a	11,451	---	8,366
Anhydrite Pond Liner Replacement (BH-MM-746)	0,000	0,000	1,000	---	0,000
Crude Oil Pipeline Mainline Valves (WH-MM-659	0,000	0,000	0,000	---	5,000
Total, Capital Equipment (including MIE)			12,451	---	13,366

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Construction Projects Summary

Construction Projects

(dollars in thousands)

	Total	Prior Years	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Site Building Upgrades (BC-MM-673)					
TEC	n/a	n/a	630	---	0,000
OPC*	n/a	n/a	630	---	0,000
TPC Project Number BC-MM-673	n/a	n/a	630	---	0,000
Site Building Upgrades Phase 2 (BH-MM-670)					
TEC	n/a	n/a	0,000	---	0,000
OPC	n/a	n/a	0,000	---	0,000
TPC Project Number BH-MM-670	n/a	n/a	0,000	---	0,000
Total All Construction Projects					
Total TEC			630	---	0,000
Total OPC			630	---	0,000
TPC All Construction Projects			630	---	0,000

*Indicates a project where the cost of the Conceptual Design Report is estimated to exceed $3M.

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

SPR Petroleum Account
Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR[1*]	FY 2014 Request
SPR Petroleum Account			
Rescission of Prior-Year Balances	0	0	0
Total, SPR Petroleum Account	0	0	0

[1.] FY 2013 Congressional Budget request included a rescission of $291 million in mandatory balances from the emergency sale of SPR oil conducted in FY 2011.

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Office Overview and Accomplishments

The SPR Petroleum Account was established in the Treasury pursuant to the provisions of the Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35). This account funds all Strategic Petroleum Reserve petroleum inventory acquisitions, associated transportation costs, U.S. Customs duties, terminal throughput charges and other related miscellaneous costs. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title.

The U.S. reliance on oil and U.S. net oil import levels, combined with the location of significant global oil reserves in regions of the world subject to political unrest, have made the U.S. vulnerable to supply disruptions. The presence of the SPR provides protection from supply disruptions.

In 2011, DOE executed an SPR Drawdown of roughly 31 million barrels in response to the IEA Libya Collective Action, reducing the SPR petroleum stockpile from 727 million to 696 million barrels and SPR import protection to approximately 80 days of U.S. net petroleum imports. About $9 million was spent from the SPR Petroleum Account in the execution of the SPR Drawdown in 2011, and Congress rescinded $500 million from the SPR Petroleum Account in the Consolidated Appropriations Act, 2012. The sales receipts from the FY 2011 drawdown created mandatory budget authority in the SPR Petroleum Account.

In FY 2013, FE is planning through market assessment to commence refill of the SPR oil sold during the IEA coordinated release once markets are at an acceptable level. Refill activities and market assessment are to continue during FY 2014.

Explanation of Changes

A rescission of $291 million was proposed in FY 2013. No rescission is proposed for FY 2014.

Northeast Home Heating Oil Reserve

Northeast Home Heating Oil Reserve

Northeast Home Heating Oil Reserve

Proposed Appropriation Language

For necessary expenses for Northeast Home Heating Oil Reserve storage, operation, and management activities pursuant to the Energy Policy and Conservation Act, $8,000,000, to remain available until expended.

Explanation of Change

No changes.

Northeast Home Heating Oil Reserve
Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Northeast Home Heating Oil			
Northeast Home Heating Oil	10,119	10,181	8,000
Total, Northeast Home Heating Oil Reserve	10,119	10,181	8,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Office Overview and Accomplishments

The Northeast Home Heating Oil Reserve (NEHHOR) provides a short-term supplement to the Northeast systems' commercial supply of heating oil in the event of a supply interruption.

Within the NEHHOR Appropriation, the NEHHOR Program funds Commercial Storage Leases, Information Technology Support, Quality Control, and Analyses.

In FY 2011, the NEHHOR Program completed the sale of all 2 million barrels of its high sulfur heating oil inventory located in commercial storage. Through FY 2012, NEHHOR converted to a 1 million barrel configuration of Ultra Low Sulfur Diesel (ULSD) stored in Northeast terminals, to meet new Northeast states' emission standards being instituted in FY 2011 and FY 2012. FY 2013 program will continue operation of 1 million barrel Reserve of ULSD.

Alignment to Strategic Plan

Under the Department's Strategic Goal, Transform Our Energy Systems, the Northeast Home Heating Oil Reserve (NEHHOR) provides a short-term supplement to the Northeast systems' private supply of heating oil in the event of a supply interruption.

Explanation of Changes

The decrease of $2.1 million is due to the reduction in NEHHOR from a two million barrel heating oil Reserve to a one million barrel higher cost ULSD Reserve and an increase in storage costs.

FY 2014 request continues operation of I million-barrel Reserve of ULSD to protect the Northeast against high vulnerability of winter-related supply shortages.

Northeast Home Heating Oil Reserve
Fossil Energy
Funding by Site by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Northeast Home Heating Oil Reserve			
Hess (Groton, CT)	2,135	---	2,315
Global Companies LLC (Revere, MA)	4,290	---	4,410
Washington Headquarters	3,694	---	1,275
Total, Northeast Home Heating Oil Reserve	10,119	10,181	8,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Northeast Home Heating Oil
Funding Profile by Subprogram and Activity

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Northeast Home Heating Oil Reserve			
Commercial Storage Leases	9,619	---	7,500
Information Technology Support	300	---	400
Quality Control and Analysis	200	---	100
Total Northeast Home Heating Oil Reserve	10,119	10,181	8,000

*FY 2013 amounts shown reflect the P.L. 112 175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 107-63, Department of Interior and Related Agencies (2001)

Overview

In supporting the Secretary's Goal of Security: Protecting the nation against interruptions in its critical heating oil supplies, the Northeast Home Heating Oil Reserve (NEHHOR) provides protection from severe heating oil supply disruptions throughout the Northeast. The NEHHOR provides a short-term supplement to the Northeast systems' commercial supply of heating oil in the event of a supply interruption. The heating oil reserve has been designed to augment commercial supplies during an emergency. The Reserve is not designed to displace the private market. It provides a buffer to assist the heating oil industry in mitigating short-term supply interruptions. The reserve is a valuable component of America's energy readiness effort, separate from the Strategic Petroleum Reserve.

Subprogram Accomplishments and Milestones

In FY 2011, NEHHOR completed the sale of all 2 million barrels of its high sulfur heating oil in commercial storage in order to make the transition to a 1 million barrel Reserve of ULSD. By February 2012, delivery was completed for the 1 million barrels of ULSD to new commercial storage locations. The purchase of ULSD was made to comply with the requirement to convert heating oil to ULSD to meet new Northeast states' emission standards beginning in FY 2011 and FY 2012. In FY2013 the program will continue operation of the 1 million barrel ULSD Reserve.

Program Planning and Management

There is a hierarchy of performance information for Petroleum Reserves. The Department collects and tracks the "critical few" measures. The Office of Petroleum Reserves monitors limited, specific, short and long-term measures. Monthly inventory certifications are submitted by storage contractors and Department of Defense quality surveillance personnel make periodic random inspections at each contracted storage site. A comprehensive annual review of each contract is conducted prior to exercise of contract option years. The on-line sales system, always available to the public in a "demo" mode, is also tested annually through a simulated sale with industry participation. Budget formulation/execution assessments are regularly conducted throughout the year, including monthly Dashboard-level Reviews and annual budget validations. Other evaluations include an annual independent inventory audit and the use of a base year contract with one-year options to assure competitive storage service rates.

Strategic Management

NEHHOR will use various means and strategies to continue its mission and achieve program goals. Assurance of a readiness posture will be accomplished through internal readiness reviews and assessments, independent audits, quantity and quality surveillance, exercises, and tests. Effectiveness of the Reserve to mitigate the economic damage of severe heating oil supply disruptions will be influenced by the Reserve's ability to quickly deliver into the market.

Subprogram Goals and Funding

In FY 2014, NEHHOR will focus on the following:

- Management of NEHHOR storage contracts and Government inventories
- Monitor all New England states' conversion to ULSD and trending biofuel requirements.
- Winter Season NEHHOR response readiness.

Explanation of Funding AND/OR Program Changes

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs FY 2012 Current
Commercial Storage Leases			
The decrease from $9,619 to $7,500 is due to a reduction in the commercial storage costs for the 1 million barrel ULSD Reserve.	9,619	7,500	-2,119
Information Technology Support			
The increase is due to increasing technical support and analysis for modernization and maintenance of heating oil sales system including cyber security requirements.	300	400	+100
Quality Control and Analysis			
The decrease is due to reduction of sites	200	100	-100
Total Funding Change, Northeast Home Heating Oil Reserve	10,119	8,000	-2,119

Ultra-Deepwater Unconventional Natural Gas

Ultra-Deepwater Unconventional Natural Gas

Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research
Funding Profile by Subprogram

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund	50,000	N/A	50,000
Receipts Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund	-50,000	N/A	-50,000
Repeal Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund	0	N/A	-50,000
Repeal Receipts Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund	0	N/A	50,000
Total, Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund	0	N/A	0

Public Law Authorizations
Public Law 109–58, "Energy Policy Act of 2005"

Overview
The Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund was established in Subtitle J of the Energy Policy Act of 2005 (EPAct) and is funded by royalties paid by industry producers.

Prudent development of domestic oil and natural gas resources will continue to be part of our Nation's overall strategy for energy security for decades to come. These operations have to be conducted responsibly, ensuring that communities are safe and that the environment is protected.

Mandatory R&D funding from EPAct Sec. 999 is too inflexible a mechanism to adequately address environmental and safety concerns in the dynamic and rapidly evolving hydraulic fracturing space. Absent Congressional action to repeal the program, the Administration has refocused this program to support R&D with significant potential public benefits, including activities consistent with the Secretary's Energy Advisory Board SEAB recommendations.

Subprogram Accomplishments and Milestones
In FY 2013, the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research was refocused on quantifying potential safety and environmental risks and on developing technologies focused on risk mitigation.

Program Planning and Management
Recommendations, analyses, and ongoing initiatives underpinning this program are:

- The *2013 Draft Annual Plan*, prepared by the Program Consortium, Research Partnership to Secure Energy for America (RPSEA),
- Final report of findings and recommendations prepared by the Department of Energy Unconventional Resources Technology Advisory Committee (URTAC)
- *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling*, Report to the President, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, January 2011,
- *Blueprint for a Secure Energy Future*, The White House, Washington, March 30, 2011,
- Final report of findings and recommendations prepared by the Department of Energy Ultra-Deepwater Advisory Committee, April 2011,
- Department of the Interior Ocean Energy Safety Committee, Meeting summary, April 2011, and
- Department of Energy *Strategic Plan*, May 2011.

Absent enacted repeal, the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research program will be managed to comply with the statutory sunset date of September 30, 2014.

Subprogram Goals and Funding
The goals of the Ultra-Deepwater and Uncoventional Natural Gas and Other Petroleum Research per the 2013 Draft Annual Plan:

Unconventional Resources Program (UCR)
The goal of UCR is to unlock the vast resources of natural gas trapped within shale deposits across the nation while addressing safety and protection of the environment.

Ultra-Deepwater Program:
The goal of UDW is to ensure that the understanding of the risks associated with ultra-deepwater operations and associated mitigation methods keep pace with the technologies that industry has developed to tap reserves in increasingly challenging conditions.

Small Producer Program:
The goal of Small Producers Program is to carry out research, development, and demonstration efforts that will assist small producers in reducing the cost and increasing the efficiency of exploration and production while operating safely and in a manner which does not harm the environment.

Elk Hills School Lands Fund

Elk Hills School Lands Fund

Elk Hills School Lands Fund
Fossil Energy

Overview
Appropriation Summary by Program

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR[1*]	FY 2014 Request
Elk Hills School Lands Fund			
Elk Hills – California Teachers' Pension Fund Settlement	0	0	0
Total, Elk Hills School Lands Fund	0	0	0

[1] A request of $15,579,815 was submitted in the FY 2013 Budget Request for the final payment under the Settlement Agreement entered into by the United States and the State of California on October 11, 1996, as authorized by section 3415 of Public Law 104-106 for final payment.

*FY 2013 amounts shown reflect the P.L. 112 75 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Office Overview and Accomplishments

The Elk Hills School Lands Fund, subject to appropriation, provides a source of compensation for the California State Teachers' Retirement System as a result of a settlement with the State of California with respect to its longstanding claim to title of two sections of land within NPR-1.

DOE and the State of California entered into a "Settlement Agreement" on October 11, 1996, in which DOE agreed, subject to appropriation, to compensate the State of California for its claim to title to two sections of land within NPR-1. The "Settlement Agreement" stipulates installments totaling nine percent of the net proceeds from the sale will be paid to the State of California.

Installments totaling $299,520,000 have been paid to date. On April 22, 2011, the Department settled NPR-1 final equity with Chevron. Under the terms of the settlement, Chevron paid $108,000,000 to the United States. That, in turn, increased the net proceeds of the sale. On August 3, 2011, the Department and the State of California agreed on the final payment of $15,579,815 with respect to the longstanding claim on the two sections of land.

Explanation of Changes

The most recent installment payment was made to the State of California in FY 2006. It was necessary for DOE to settle NPR-1 final equity with Chevron before the final net proceeds from the sale of DOE's share of NPR-1 could be determined, and that has now been accomplished. The final installment payment of $15,579,815 was requested in the FY2013 Congressional Budget, but not appropriated.