Energy Conservation

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Energy Conservation

Proposed Appropriation Language

For necessary expenses in carrying out energy conservation activities, [$888,937,000] $875,933,000 to remain available until expended: Provided, That [$274,500,000] $331,998,000 shall be for use in energy conservation grant programs as defined in section 3008(3) of Public Law 99-509 (15 U.S.C. 4507): Provided further, That notwithstanding section 3003(d)(2) of Public Law 99-509, such sums shall be allocated to the eligible programs as follows: [$230,000,000] $291,200,000 for weatherization assistance grants and [$44,500,000] $40,798,000 for State energy program grants.

Explanation of Change

The increase +$61,200,000 in weatherization assistance grants maintains the President's continuing commitment to helping families and individuals, especially the elderly, poor and disabled, lower their monthly energy bills.

Energy Conservation
Office of Energy Efficiency and Renewable Energy

Overview

Appropriation Summary by Program

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Comparable Appropriation	FY 2005 Base	FY 2005 Request	FY 2005 Request vs Base	
					$ Change	% Change
Energy Conservation						
Vehicle Technologies ...	174,171	178,002	178,002	156,656	-21,346	-12.0%
Fuel Cell Technologies ..	53,906	65,187	65,187	77,500	+12,313	+18.9%
Weatherization and Intergovernmental Activities.....	314,155	308,612	308,612	364,067	+55,455	+18.0%
Distributed Energy Resources.....	60,054	61,023	61,023	53,080	-7,943	-13.0%
Building Technologies ...	58,327	59,866	59,866	58,284	-1,582	-2.6%
Industrial Technologies	96,824	93,068	93,068	58,102	-34,966	-37.6%
Biomass and Biorefinery Systems R&D	24,050	7,506	7,506	8,680	+1,174	+15.6%
Federal Energy Management Program...	19,299	19,716	19,716	17,900	-1,816	-9.2%
Program Management...	76,950	85,004	87,950	81,664	-6,286	-7.1%
Energy Efficiency Science Initiative.....	2,440	0	0	0	0	0.0%
Total, Energy Conservation...	880,176	877,984	884,270	875,933	+8,337	+0.9%

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Comparable Appropriation	FY 2005 Base	FY 2005 Request	FY 2005 Request vs Base	
					$ Change	% Change
Energy Supply (EERE)						
Hydrogen Technology ..	38,113	81,991	81,991	95,325	+13,334	+16.3%
Solar Energy.....	82,330	83,393	83,393	80,333	-3,060	-3.7%
Zero Energy Buildings ...	7,572	0	0	0	0	0.0%
Wind Energy	41,640	41,310	41,310	41,600	+290	+0.7%
Hydropower	5,016	4,905	4,905	6,000	+1,095	+22.3%
Geothermal Technology	28,390	25,508	25,508	25,800	+292	+1.1%
Biomass and Biorefinery Systems R&D	85,283	86,471	86,471	72,596	-13,875	-16.0%
Intergovernmental Activities.....	14,449	14,720	14,720	16,000	+1,280	+8.7%
Departmental Energy Management Program...	1,445	1,963	1,963	1,967	+4	+0.2%
Renewable Program Support	0	4,919	4,919	0	-4,919	-100.0%
National Climate Change Technology Initiative Competitive Solicitation	0	0	0	3,000	+3,000	
Facilities and Infrastructure	5,297	12,950	12,950	11,480	-1,470	-11.4%
Program Direction.....	12,615	12,364	12,364	20,711	+8,347	+67.5%
Subtotal, Energy Supply (EERE)	322,150	370,494	370,494	374,812	+4,318	+1.2%
Use of prior year balances	0	-13,000	-13,000	0	+13,000	+100.0%
General Reduction	0	0	0	0	0	0.0%
Total, Energy Supply (EERE)	322,150	357,494	357,494	374,812	+17,318	+4.8%
Total, Energy Supply and Energy Conservation.....	1,202,326	1,235,478	1,235,478	1,250,745	+15,267	+1.2%

Detailed Funding Table

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
Energy Conservation			
Vehicle Technologies			
Vehicle Systems			
Heavy Vehicle Systems R&D			
Vehicle Systems Optimization	9,555	10,188	8,983
Truck Safety Systems	397	394	100
Total, Heavy Vehicle Systems	9,952	10,582	9,083
Ancillary Systems	1,100	1,185	1,300
Simulation and Validation	2,433	2,568	3,500
Total, Vehicle Systems	13,485	14,335	13,883
Innovative Concepts			
Graduate Automotive Technology Education	500	494	500
Cooperative Automotive Research for Advanced Technology	494	0	0
Stimulate Truck Innovative Concepts and Knowledge	596	0	0
Total, Innovative Concepts	1,590	494	500
Hybrid and Electric Propulsion			
Energy Storage			
High Power Energy Storage	17,241	17,457	17,675
Advanced Battery Development	2,403	1,481	1,500
Exploratory Technology Research	1,923	4,469	9,525
Total, Energy Storage	21,567	23,407	28,700
Advanced Power Electronics	13,355	13,522	13,900
Subsystem Integration and Development			
Light Vehicle Propulsion and Ancillary Subsystems	3,135	3,097	3,735
Heavy Vehicle Propulsion and Ancillary Subsystems	3,939	4,976	5,486
Total, Subsystem Integration and Development	7,074	8,073	9,221
Total, Hybrid and Electric Propulsion	41,996	45,002	51,821

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Advanced Combustion R&D			
Combustion and Emission Control	22,994	22,716	22,000
Light Truck Engine	14,734	12,944	0
Heavy Truck Engine	12,174	11,832	10,436
Waste Heat Recovery Subactivity	488	2,469	1,500
Off-Highway Engine R&D	3,414	3,456	0
Health Impacts	1,463	988	2,000
Total, Advanced Combustion R&D	55,267	54,405	35,936
Materials Technology			
Propulsion Materials Technology			
Automotive Propulsion Materials	1,952	2,964	2,000
Heavy Vehicle Propulsion Materials	5,705	5,778	5,000
Total, Propulsion Materials Technology	7,657	8,742	7,000
Lightweight Materials Technology			
Automotive Lightweight Materials	14,242	16,632	21,000
Heavy Vehicle High Strength Weight Reduction Materials	8,731	8,839	7,799
Total, Lightweight Materials Technology	22,973	25,471	28,799
High Temperature Materials Laboratory	5,464	5,531	4,000
Total, Materials Technology	36,094	39,744	39,799
Fuels Technology			
Advanced Petroleum Based Fuels	12,955	10,272	4,000
Non-Petroleum Based Fuels & Lubricants			
Medium Trucks	1,314	1,284	0
Heavy Trucks	1,409	1,383	0
Fueling Infrastructure	1,204	1,185	0
Renewable and Synthetic Fuels Utilization	0	395	2,800
Total, Non-Petroleum Based Fuels & Lubricants	3,927	4,247	2,800

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Environmental Impacts	2,282	1,975	0
Total, Fuels Technology	19,164	16,494	6,800
Technology Introduction			
Legislative and Rulemaking (formerly Energy Policy Act Replacement Fuels)			
State & Fuel Provider Fleet	750	746	1,000
Private & Local Fleet	250	199	300
Fuel Petitions	100	105	314
Federal Fleets	500	0	700
Regulatory Support	92	37	200
Total, Legislative and Rulemaking (formerly Energy Policy Act Replacement Fuels)	1,692	1,087	2,514
Testing and Evaluation			
Federal Fleets	0	507	0
Vehicle Evaluation	1,934	2,358	2,450
Infrastructure Testing	50	98	50
Total, Testing and Evaluation	1,984	2,963	2,500
Advanced Vehicle Competitions	894	889	1,000
Total, Technology Introduction	4,570	4,939	6,014
Technical Program Management Support	2,005	2,095	1,903
Biennial FreedomCAR Peer Review	0	494	0
Total, Vehicle Technologies	174,171	178,002	156,656
Fuel Cell Technologies			
Transportation Systems	6,160	7,506	7,600
Distributed Energy Systems	7,268	7,408	7,500
Stack Component R&D	14,803	25,186	30,000
Fuel Processor R&D	23,489	14,815	13,858
Technology Validation	1,788	9,877	18,000

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Technical/Program Management Support	398	395	542
Total, Fuel Cell Technologies	53,906	65,187	77,500
Weatherization and Intergovernmental Activities			
Weatherization Assistance Grants			
Weatherization Assistance	220,184	223,759	286,832
Training and Technical Assistance	3,353	3,407	4,368
Total, Weatherization Assistance Grants	223,537	227,166	291,200
State Energy Program Grants	44,708	43,952	40,798
State Energy Activities			
Cooperative Programs with States	2,928	0	0
Planning and Evaluation Support for State and Local Grant Programs	2,337	2,324	2,353
Total, State Energy Activities	5,265	2,324	2,353
Gateway Deployment			
Rebuild America	11,034	10,003	8,826
Energy Efficiency Information and Outreach	2,267	1,392	1,200
Building Codes Training and Assistance	4,569	4,445	4,800
Clean Cities	10,924	10,973	7,000
Energy Star	4,173	3,654	5,000
National Industrial Competitiveness through Energy, Environment, and Economics	2,670	0	0
Inventions and Innovations	3,776	4,318	2,500
International Market Development	646	0	0
Technical/Program Management Support	586	385	390
Total, Gateway Deployment	40,645	35,170	29,716
Total, Weatherization and Intergovernmental Activities	314,155	308,612	364,067

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
Distributed Energy Resources			
Distributed Generation Technology Development			
Industrial Gas Turbines	4,769	3,950	3,000
Microturbines	6,955	6,914	7,000
Advanced Reciprocating Engines	11,792	13,828	9,000
Technology Based – Advanced Materials and Sensors	7,925	8,155	8,279
Fuel Flexibility	745	0	250
Thermally-Activated Technologies	7,610	7,566	5,160
Total, Distributed Generation Technology Development	39,796	40,413	32,689
End-Use System Integration and Interface			
Distributed Energy Systems Applications Integration	8,284	8,234	7,861
Cooling, Heating and Power Integration	11,448	11,852	12,000
Total, End-Use System Integration and Interface	19,732	20,086	19,861
Technical/Program Management Support	526	524	530
Total, Distributed Energy Resources	60,054	61,023	53,080
Building Technologies			
Residential Buildings Integration			
Research and Development: Building America	11,558	12,484	18,342
Residential Building Energy Codes	575	583	590
Total, Residential Buildings Integration	12,133	13,067	18,932
Commercial Buildings Integration			
Research and Development	3,858	3,905	4,454
Commercial Building Energy Codes	528	535	541
Total, Commercial Buildings Integration	4,386	4,440	4,995
Emerging Technologies			
Lighting R&D	9,982	11,402	12,500
Space Conditioning and Refrigeration R&D	5,580	5,337	3,000
Appliances and Emerging Technologies R&D	1,703	1,980	1,755

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Building Envelope R&D	8,041	8,190	5,000
Analysis Tools and Design Strategies	3,032	3,088	2,802
Technology Road Maps	2,226	0	0
Total, Emerging Technologies	30,564	29,997	25,057
Equipment Standards and Analysis	9,635	10,387	7,800
Oil Heat Research for Residential Buildings	0	494	0
Technical/Program Management Support	1,609	1,481	1,500
Total, Building Technologies	58,327	59,866	58,284
Industrial Technologies			
Industries of the Future (Specific)			
Forest and Paper Products Industry	10,488	8,021	3,000
Steel Industry	10,083	6,685	3,767
Aluminum Industry	7,908	6,583	2,704
Metal Casting Industry	5,228	4,052	2,000
Glass Industry	4,462	3,301	1,763
Chemicals Industry	14,079	13,184	7,075
Mining Industry	5,484	4,694	1,400
Supporting Industries	1,561	727	700
Total, Industries of the Future Specific (Specific)	59,293	47,247	22,409
Industries of the Future (Crosscutting)			
Industrial Materials of the Future	13,328	12,542	11,000
Combustion	1,952	1,975	1,600
Gasification Programs	0	4,939	0
Robotics	0	1,975	0
Sensors and Control Techniques	3,683	3,728	3,100
Industrial Technical Assistance	14,570	14,745	16,200
Total, Industries of the Future (Crosscutting)	33,533	39,904	31,900
Technical/Program Management Support	3,998	5,917	3,793
Total, Industrial Technologies	96,824	93,068	58,102

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
Biomass and Biorefinery Systems R&D			
Utilization of Platform Outputs	8,960	7,110	8,280
Industrial Gasification	14,279	0	0
Technical Program Management Support	811	396	400
Total, Biomass and Biorefinery Systems R&D	24,050	7,506	8,680
Federal Energy Management Program			
Project Financing			
Energy Savings Performance Contracts	6,059	6,367	5,950
Utilities Program	1,780	1,759	1,500
Total, Project Financing	7,839	8,126	7,450
Technical Guidance and Evaluation			
Direct Technical Assistance	5,800	6,165	6,000
Training and Information	2,025	1,975	1,900
Total, Technical Guidance and Evaluation	7,825	8,140	7,900
Planning, Reporting, and Evaluation	2,751	2,571	2,550
Technical/Program Management Support	884	879	0
Total, Federal Energy Management Program	19,299	19,716	17,900
Program Management			
Program Direction			
Salaries and Benefits	47,467	48,300	52,107
Travel	2,764	2,996	3,025
Support Services	11,731	10,111	10,557
Other Related Expenses	7,979	8,725	9,420
Total, Program Direction	69,941	70,132	75,109
Planning, Evaluation, and Analysis	4,972	4,944	5,005
Information, Communications, and Outreach	1,540	1,531	1,550

	(dollars in thousands)		
	FY 2003	FY 2004	FY 2005
Cooperative Programs with States	0	4,939	0
Congressionally Directed Activities	497	3,458	0
Total, Program Management	76,950	85,004	81,664
Energy Efficiency Science Initiative	2,440	0	0
Total, Energy Conservation	880,176	877,984	875,933

Preface

It is in the nation's long term national and economic security interest to use our energy resources wisely. The Office of Energy Efficiency and Renewable Energy (EERE) pursues a balanced portfolio of research, development, demonstration, and deployment, investing in: 1) the technologies that allow us to harvest domestic solar, wind, hydropower, geothermal, and biomass energy; 2) the technologies to use those resources efficiently in our homes, schools, businesses, factories, and vehicles; and 3) the tools, processes and methods to help consumers fully and productively use these new energy opportunities.

EERE comprises 12 main programs: Hydrogen and Fuel Cell Infrastructure Technology, Solar Energy Technology, Wind Energy Technology, Hydropower Technologies, Geothermal Technologies, Biomass and Biorefinery Systems R&D Technology, Weatherization and Intergovernmental Activities, and Federal Energy Management Program, Vehicle Technologies, Distributed Energy Resources, Building Technologies, and Industrial Technologies. In addition, EERE supports Renewable Program Support, National Climate Change Technology Initiative Competitive Solicitation, Facilities and Infrastructure, Program Direction, and Energy Efficiency Science Initiative. Two appropriation accounts, Energy Conservation and Energy Supply fund these activities. Four programs have complementary funding in Energy Conservation and Energy Supply. They are: Biomass and Biorefinery Systems R&D; Federal Energy Management Program; Fuel Cells, and the Weatherization and Intergovernmental Program.

Within the Energy Conservation appropriation, EERE currently supports eight programs: Vehicle Technologies (nine subprograms), Fuel Cell Technologies (six subprograms), Weatherization and Intergovernmental Activities (four subprograms), Distributed Energy Resources (three subprograms), Building Technologies (six subprograms), Industrial Technologies (three subprograms), Biomass and Biorefinery Systems R&D (three subprograms), and Federal Energy Management Program (four subprograms).

This Overview will describe Strategic Context, Mission, Benefits, Strategic Goals and Funding by General Goal. These items together put the appropriation in perspective. This Overview will also address R&D Investment Criteria, Program Assessment Rating Tool (PART), and Significant Program Shifts.

Strategic Context

Following publication of the Administration's National Energy Policy, the Department developed a Strategic Plan that defines its mission, four strategic goals for accomplishing that mission, and seven general goals to support the strategic goals. Each appropriation has developed quantifiable goals to support the general goals. Thus, the "goal cascade" is the following:

Department Mission -> Strategic Goal (25 yrs) -> General Goal (10-15 yrs) -> Program Goal (GPRA Unit) (10-15 yrs)

To provide a concrete link between budget, performance, and reporting, the Department developed a "GPRA[a] Unit" concept. Within DOE, a GPRA Unit defines a major activity or group of activities that support the core mission and aligns resources with specific goals. Each GPRA Unit has completed or will complete a Program Assessment Rating Tool. A unique program goal was developed for each GPRA unit. A numbering scheme has been established for tracking performance and reporting.[b]

The goal cascade accomplishes two things. First, it ties major activities for each program to successive goals and, ultimately, to DOE's mission. This helps ensure the Department focuses its resources on fulfilling its mission. Second, the cascade allows DOE to track progress against quantifiable goals and to tie resources to each goal at any level in the cascade. Thus, the cascade facilitates the integration of budget and performance information in support of the GPRA and the President's Management Agenda (PMA).

Mission

The Office of Energy Efficiency and Renewable Energy strengthens America's energy security, environmental quality, and economic vitality through public-private partnerships that:

- promote energy efficiency and productivity;
- bring clean, reliable, and affordable energy technologies to the marketplace; and
- make a difference in the everyday lives of Americans by enhancing their energy choices and quality of life.

Benefits

EERE pursues this mission through a mix of research, development, demonstration and deployment efforts which improve the energy efficiency of our economy and increase the use of domestic renewable energy resources. Making more productive use of all of our energy resources and making greater use of our abundant, clean domestic renewable energy resources provides a number of economic, environmental, and security benefits to the United States. Energy bills are lower and consumers are less susceptible to energy price fluctuations. Emissions of Clean Air Act criteria pollutants (sulfur dioxide, nitrogen oxide, carbon monoxide, and particulates), mercury, and carbon dioxide are lower. Energy security is enhanced as dependence on imported petroleum (and, increasingly in the future, natural gas)

[a] Government Performance and Results Act of 1993

[b] The numbering scheme uses the following numbering convention: First 2 digits identify the General Goal that (01 through 07); second two digits identify the GPRA Unit; last four digits are reserved for future use.

is reduced and the mix of domestic energy resources increases. Security is also enhanced as the loads on our energy infrastructure are reduced, reducing the potential for wide-spread energy outages. Additionally, the development of distributed energy resources increases the reliability of energy supplies, even during emergencies.

Based on its modeling efforts, EERE estimates that U.S. consumption of non-renewable energy resources would, given current policies and a business-as-usual energy future, be about 10 quads lower in 2025 and over 30 quads lower in 2050 as a result of being able to realize these efficiency and renewable improvements. This will offset more than 50 percent of the expected growth in energy consumption through 2050. More detailed, integrated and comprehensive economic, energy and energy security benefits estimates and their sensitivities are provided in the Expected Integrated Program Outcomes section at the end of this overview.

Strategic Goals

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission) plus seven general goals that tie to the strategic goals. The Energy Conservation appropriation supports the following goals:

Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply of reliable, affordable, and environmentally sound energy.

General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

The programs funded by the Energy Conservation appropriation have the following ten Program Goals which contribute to the General Goal in the "goal cascade":

Program Goal 04.02.00.00: Vehicle Technologies. The Vehicle Technologies Program goal is to develop technologies that enable cars and trucks to become highly efficient, through improved power technologies and cleaner domestic fuels, and to be cost and performance competitive. Manufacturers and consumers will then use these technologies to help the Nation reduce both energy use and greenhouse gas emissions thus improving energy security by dramatically reducing dependence on oil.

Program Goal 04.01.02.00: Fuel Cell Technology. The Hydrogen, Fuel Cells and Infrastructure Technologies Program goal is to develop hydrogen production, storage, and delivery technologies to the point that they are cost and performance competitive and are being used by the Nation's transportation, energy, and power industries. As such, the Program will expand and make our clean domestic energy supplies more flexible dramatically reducing or even ending dependence on foreign oil.

Program Goal 04.09.00.00: Weatherization. The mission of the Weatherization Assistance Program is to increase the energy efficiency of dwellings occupied by low-income Americans, thereby reducing their energy costs, while safeguarding their health and safety. DOE works directly with States and local governments, which contract with local governmental or non-profit agencies to deliver weatherization services.

Program Goal 04.10.00.00: State Energy Program Grants. The State Energy Program Grants goal is to strengthen and support the capabilities of States to promote energy efficiency and to adopt renewable

energy technologies, helping the nation achieve a stronger economy, a cleaner environment and greater energy security.

Program Goal 04.11.02.00: Intergovernmental Activities. The mission of Intergovernmental Activities is to fund activities that facilitate the movement of energy efficient and renewable energy products into the market place and the integrated deployment of efficiency and renewable resources to communities and customers.

Program Goal 04.59.00.00: Distributed Energy Resources. The Distributed Energy Resources Program goal is to develop and facilitate market adoption of a diverse array of cost competitive integrated distributed generation and thermal energy technologies in homes, businesses, industry, communities, and electricity companies, increasing the efficiency of electricity generation, delivery, and use, improving electricity reliability, and reducing environmental impacts.

Program Goal 04.04.02.00: Building Technologies. The Building Technologies Program goal is to develop cost effective tools, techniques and integrated technologies, systems and designs for buildings that generate and use energy so efficiently that buildings are capable of generating as much energy as they consume.

Program Goal 04.60.00.00: Industrial Technologies. The Industrial Technologies Program goal is to partner with our most energy-intensive industries in strategic planning and energy-specific RD&D to develop the technologies needed to use energy efficiently in their industrial processes and cost-effectively generate much of the energy they consume. The result of these activities will save feedstock and process energy, create domestic supply, improve the environmental performance of industry, and help America's economic competitiveness.

Program Goal 04.08.02.00: Biomass and Biorefinery Systems R&D. Develop biorefinery-related technologies to the point that they are cost- and performance-competitive and are used by the Nation's transportation, energy, chemical and power industries to meet their market objectives. This helps the Nation by reducing fossil energy consumption, our oil dependence, and greenhouse gas emissions, while also expanding domestic energy supplies and improving the Nation's energy infrastructure.

Program Goal 04.13.02.00: Federal Energy Management Program (FEMP). FEMP's goal is to provide the efficiency and renewable energy related technical assistance Federal agencies need to lead the Nation by example through government's own actions, expressly increasing Federal renewable energy use by 2.5% by 2005 and reducing energy intensity in Federal buildings by 35% by 2010 (using 1985 as a baseline).

Contributions to General Goal 4, Energy Security

Vehicle Technologies, Fuel Cell Technologies, Weatherization and Intergovernmental Activities, Distributed Energy Resources, Building Technologies, Industrial Technologies, Biomass and Biorefinery Systems R&D, and Federal Energy Management Programs contribute to General Goal 4 by working together and with supply programs to reduce the probability and magnitude of energy based disruptions.

These integrated contributions to improving energy security include (1) reducing demand-side pressure on our energy markets, (2) reducing energy imports; (3) diversifying the mix of domestic energy production; (4) providing smaller, non-fuel based sources of electricity generation that are inherently less susceptible to interdiction, attack or large losses; and (5) increasing our ability to adjust demand loads as needed, particularly during emergencies.

Clean distributed generation can reduce transmission and distribution bottle-necks, and can help maintain critical electricity functions during an outage without adding to the unhealthy air quality that often accompanies peak electricity days. EERE programs also provide key areas of support during emergencies: The State Energy Program (SEP) funds on-the-ground energy emergency planning and response while FEMP is often called upon to help when local energy markets become constrained. Clean distributed generation can reduce transmission and distribution bottle-necks and help maintain critical electricity functions during an outage, which are more like during peak electricity demand. These technologies cannot replace the need to maintain well-functioning energy infrastructure. They can, however, improve the inherent security of our energy systems, as well as reduce the need for costly expansions of our transmission lines, pipelines, and other infrastructure.

Given current expectations about future energy technologies and markets, and assuming no changes in energy policies, EERE's integrated portfolio can be expected to: (1) reduce future demand for traditional energy sources by approximately 10 quads in 2025 and over 30 quads in 2050 (beyond the efficiency and renewable improvements expected in the absence of these programs); and (2) reduce the need for new electricity capacity by nearly 150 gigawatts (GW) in 2025. Oil savings would be roughly 2 million barrels per day (MBD) in 2025 and over 10 MBD in 2050. Individual program activities planned for and funded by this appropriation would contribute to these improvements in the following ways under these business-as-usual conditions:

Vehicle Technologies contribute to this goal by developing technologies that enable highly efficient cars and trucks, including power technologies, clean domestic fuels, and lightweight materials which will enable overall Vehicle Technologies oil savings of 3 MBD by 2025 and 8 MBD in 2050 under expected market conditions.

Fuel Cell Technologies contribute to this goal by integrating hydrogen, fuel cell and infrastructure technology research and development resulting in lower cost and higher efficiency fuel cells which in conjunction with the development of the means to produce large quantities of competitively produced hydrogen from natural gas and renewables will enable the integrated program to displace 0.4 MBD of oil in 2025 and over 5 MBD in 2050 under business-as-usual conditions, while providing the country with the option for substantially faster growth in hydrogen use if circumstances warrant.

Weatherization and Intergovernmental Activities contribute to this goal by accelerating adoption of cost-effective efficient technologies through weatherization, state energy grants, technology demonstration, building code improvements, technical assistance, and education which will help reduce energy intensity in all sectors of the economy, with a resulting reduction in energy consumption of 1.1 quads in 2025.

Distributed Energy Resources contribute to this goal by making available by 2015 a diverse array of integrated distributed generation and thermal energy technologies at market competitive prices, which can provide 14 GW of additional distributed generation by 2025.

Building Technologies contribute to this goal by developing advanced lighting and appliances, which when coupled with improved building system integration and design, will provide marketable technologies that can reduce energy use by up to 70 percent in homes by 2020 and commercial buildings by 2025. Improvements in equipment standards, building codes, and consumer access to these technologies will also facilitate marketable improvements in the efficiency of existing buildings by 20 percent, which can reduce building energy use by 1.4 quads per year in 2025 and nearly 3 quads by 2050.

Industrial Technologies contribute to this goal by developing more efficient industrial processes in energy intensive industries, which when coupled with wider best practice application of these technologies, will reduce industrial energy use by an additional 2 quads per year by 2025.

Biomass and Biorefinery Systems R&D contribute to this goal by developing by 2010 validated cost- and performance-competitive biorefinery technologies that co-produce bio-based fuels, products, and power which will displace 115 trillion Btus per year of oil in 2025, more than 1 quad by 2050, and potentially more with fully integrated approaches.

Federal Energy Management Program (including DEMP) contributes to this goal by project financing, technical assistance, and project evaluation which will reduce energy intensity in Federal buildings by 35 percent in 2010 from 1985 levels.

Funding by General Goal

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Comparable Appropriation	FY 2005 Request	$ Change	% Change
Goal 4, Energy Security					
Program Goal 04.02.00.00, Vehicle Technologies	174,171	178,002	156,656	-21,346	-12.0%
Program Goal 04.01.02.00, Fuel Cell Technologies	53,906	65,187	77,500	+12,313	+18.9%
Program Goal 04.09.00.00 Weatherization and Intergovernmental Activities	223,537	227,166	291,200	+64,034	+28.2%
Program Goal 04.10.00.00 State Energy Program	49,973	46,276	43,151	-3,125	-6.8%
Program Goal 04.11.02.00 Intergovernmental Activities	40,645	35,170	29,716	-5,454	-15.5%
Program Goal 04.12.00.00 Distributed Energy Resources	60,054	61,023	53,080	-7,943	-13.0%
Program Goal 04.04.02.00 Building Technologies	58,327	59,866	58,284	-1,582	-2.6%
Program Goal 04.60.00.00, Industrial Technologies	96,824	93,068	58,102	-34,966	-37.6%
Program Goal 04.08.02.00, Biomass and Biorefinery Systems R&D	23,057	7,506	8,680	+1,174	+15.6%
Program Goal 04.13.02.00, Federal Energy Management Program	19,299	19,716	17,900	-1,816	-9.2%
Total Goal 4, Energy Security	799,793	792,980	794,269	+1,289	+0.2%

(dollars in thousands)

	FY 2003 Comparable Appropriation	FY 2004 Comparable Appropriation	FY 2005 Request	$ Change	% Change
All Other					
Biomass and Biorefinery Systems R&D	993	0	0	0	0.0%
Program Management	76,950	85,004	81,664	-3,340	-3.9%
Energy Efficiency Science Initiative	2,440	0	0	0	0.0%
Total, All Other	80,383	85,004	81,664	-3,340	-3.9%
Total, Energy Conservation	880,176	877,984	875,933	-2,051	-0.2%

R&D Investment Criteria

The President's Management Agenda identified the need to tie R&D investment to performance and well-defined practical outcomes. One criterion by which the Department's performance is assessed involves using a framework in the R&D funding decision process, and then referencing the use and outcome of the framework in budget justification material.

The goal is to develop analytical justifications for applied research portfolios in future budgets. This will require the development and application of a uniform cost and benefit evaluation methodology across programs to allow meaningful program comparisons.

This process is underway in several key areas; 1) common, consistent, and integrated analysis (modeling grounded in the EIA basecase); 2) development of a more complete and robust framework for describing program benefits -- provided in the Expected Integrated Program Outcomes section of the overviews and in the individual Expected Program Outcomes section; and 3) development of sound analytic tools to better estimate and link potential impacts, support budget justification and describe how the R&D Investment Criteria (RDIC) influenced budget decisions.

EERE used the RDIC to support determination of relative areas of strength and weakness in the program and in selected areas of technology development. Programs have made improvements using the individual criteria as a guide to opportunities to improve program strategic management and planning, incorporating key RDIC criteria into their multi-year planning and PART (Program Assessment Rating Tool) documentation. Pilot application of the RDIC to DOE Energy Applied R&D programs was somewhat different than that used for other government programs that underwent PART; there were evidence requirements, a two-tier scoring system, and unique portfolio questions and support requirements that made scoring well on the PART more challenging. That EERE's program generally scored well reflects the quality of these programs. DOE and OMB are working to resolve the requirements and process so they productively meet the intent of the President's Management Agenda.

Program Assessment Rating Tool (PART)

The Department implemented a tool to evaluate selected programs. PART was developed by the Office

of Management and Budget (OMB) to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews.

The current focus is to establish outcome- and output-oriented goals, the successful completion of which will lead to benefits to the public, such as increased national security and energy security, and improved environmental conditions. DOE has incorporated feedback from OMB into the FY 2005 Budget, and the Department will take the necessary steps to continue to improve performance.

In the FY 2005 PART Review, OMB assessed the Weatherization, Building Technologies and Distributed Energy Resources (DER) programs within the Interior and Related Agencies account (the DER program was added in FY 2005). EERE program and corporate management have incorporated PART questions into program planning, performance and management. As noted above the PART was revised for FY2005 to incorporate the RDIC and to reflect other improvements. The net effect made scoring well quite challenging especially for DOE's applied R&D programs which concurrently addressed the changes in questions and evidence requirements, a two-tier scoring system and unique portfolio questions and support requirements applied to the DOE Energy R&D programs, as distinct from what was required from other government programs that underwent PART.

The Buildings and Weatherization Programs have directly addressed FY 2004 PART findings and recommendations within their control. FY 2005 performance hierarchy, goals, targets and program indicators are consistent in PART and program budgets. EERE has corporately addressed common items. For example it has begun improving consistency of benefits estimates through the consolidation of these analyses in its new organization, although work remains in this area. EERE has also added a corporate wide measure to reduce uncosted balances, contributed to by all programs. EERE is working with Departmental and OMB staff to improve PART processes, systems and scoring consistency to enable our performance to be accurately portrayed by PART.

Significant Program Shifts

Vehicle Technologies: With the completion of the light truck combustion engine R&D in FY 2004 (-$12.9 million), focus is being shifted to Hybrid and Electric Propulsion (+$5.1 million) to explore energy storage systems with potential for significant improvements over existing technologies for use in hybrid vehicles, including fuel cell hybrid vehicles. Fuels Technology is reduced (-$9.7 million) as research into the sensitivity of emission control after treatment to sulfur will be completed in FY 2005, and as light-duty natural gas engine/vehicle/infrastructure technology (brought to conclusion with FY 2004 funding) is considered mature and ready for commercialization. Increased funds (+$2.4) will be used to evaluate variances in molecular makeup in commercially available biomass-based fuels and to initiate development of specifications so that these fuels will not adversely affect engine performance when blended with petroleum based feedstocks.

Fuel Cell Technologies: Funding will be increased to accelerate stack component research (+$4.8 million) to develop advanced fuel cell membrane technologies with higher performance capacity and durability. Within Technology Validation, increased funding (+$8.1 million) will support demonstrations to validate performance, durability, and reliability of fuel cell systems and to gather and analyze fuel cell vehicle performance data.

Weatherization and Intergovernmental Activities: Funding for Weatherization Assistance Grants will be increased (+$64.0 million), reflecting the President's continuing commitment to reduce energy bills of low-income households.

Building Technologies: Within Emerging Technologies, Solid State Lighting will be funded at $10.2 million (+$3.3 million) within the Lighting R&D subprogram, to accelerate development of this advanced lighting technology that can achieve upwards of 70 percent. Thermal insulation research is suspended (-$3.2 million) to accelerate higher-priority Residential Buildings Integration R&D (+$5.9 million).

Industrial Technologies: Funding for this program is reduced (-$35.0 million) to better align requested resources in support of DOE's General Goal 4 (Energy Security) and enhance support for higher-priorities such as Fuel Cell Technologies and Weatherization Assistance Grants within the EERE Energy Conservation program portfolio.

Congressional Items of Interest

(dollars in thousands)

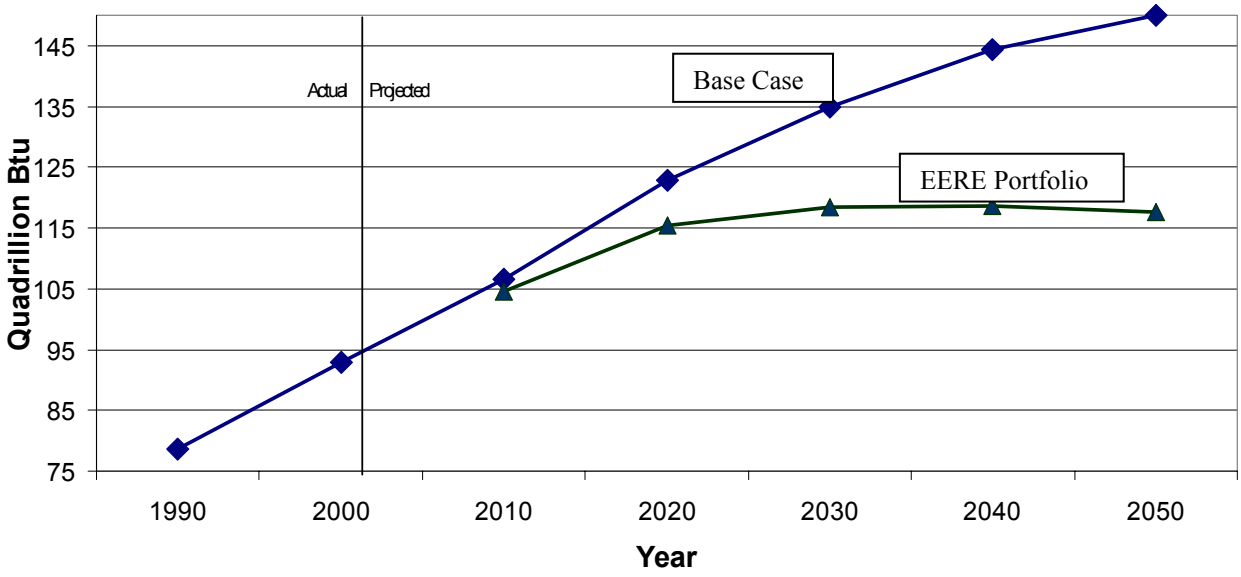
	FY 2003	FY 2004	FY 2005	$ Change	% Change
Vehicle Technologies (Energy Conservation)					
Northwest Alliance for Transportation Technologies	3,225	0	0	0	0.0%
Total, EERE	3,225	0	0	0	0.0%

Expected Integrated Program Outcomes

EERE's programs pursue their mission through an integrated portfolio of Research, Development, Demonstration and Deployment activities which improves the energy efficiency and productivity of our economy. Figure 1 below depicts the related potential shift in nonrenewable energy consumption. We expect the energy efficiency and renewable energy components of these energy savings to result in lower energy bills and reduced susceptibility to energy price fluctuations; reduced EPA criteria pollutants and other pollutants; enhanced energy security as petroleum and natural gas dependence is reduced and domestic fuel supplies increase; and greater energy security and reliability from improvements in energy infrastructure. Indicators of some of these programs benefits are provided in the tables below. The results shown in the long term benefits tables are preliminary estimates based on initial modeling of some of the possible program production technologies. The assumptions and methods underlying the modeling efforts have significant impact on the expected benefits, the resulting point estimates could also vary significantly based upon market interactions and commodity prices. A summary of the methods, assumptions, sensitivities, and models used in developing these benefit estimates that are important for understanding these results are provided at

www.eere.energy.gov/office_eere/budget-gpra.html. Final documentation is estimated to be completed and posted by March 15, 2004.

Figure 1. U.S. Nonrenewable Energy Consumption, 1990-2000, and Projections to 2050



EERE's portfolio includes a mix of efforts intended to produce short, mid, and long term benefits. The size of these benefits depend not only on the success of the EERE program efforts funded in this budget request, but on how future energy markets and policies evolve. EERE estimates a sub-set of these benefits assuming a continuation of current policies and business-as-usual development of energy markets. These estimates do not include the underlying, basecase improvements in energy efficiency and renewable energy use that would be expected in the absence of continued funding of EERE's programs.

Mid-term Benefits

		(calendar year)			
		2010	2015	2020	2025
Economic	Energy bill savings (billion 2001$)	27	51	90	134
Environment	CO2 emissions reductions (mmtce)	35	74	139	213
Security	Oil savings (mmbpd)	0.2	0.5	1.1	2.1
	Natural gas savings (quads)	0.7	1.0	1.9	1.9
	Reduced need for additions to central conventional power (GW)	24	65	102	153

Under these assumptions, EERE's programs could provide mid-term benefits in 2025 of over $100 million in annual energy bill savings; a reduction of about 200 million metric tons of annual carbon emissions; a savings of about 2 million barrels of oil per day; and a reduction of over 1.5 quads of

natural gas consumption. A combination of reduced peak demand for electricity and additional renewable and DG capacity reduces the need for some 150 GW of additional conventional central power generation, increasing the flexibility and diversity of our electricity system while reducing the potential for a shortage of new generating capacity.

EERE's portfolio includes a number of efforts to develop fundamental breakthroughs in technologies that promise major changes in how we will produce, and the ways we use energy in the decades to come. If these breakthroughs succeed, benefits could continue to grow in the long term. By 2050 benefits may include reductions in the overall annual cost of our energy systems of over $200 billion; reductions in annual carbon dioxide emissions of nearly 600 mmtce; reductions in oil demand of over 10 million barrels per day; and annual savings in natural gas demand of over 4 quads.

Long-Term Benefits

		(calendar year)		
		2030	2040	2050
Economic	Overall Energy cost savings (billion 2001$)	88	171	236
Environment	CO2 emissions reductions (mmtce)	334	471	593
Security	Oil savings (mbpd)	4.7	9.0	11.6
	Natural gas savings (quads)	2.8	5.2	4.5

These mid and long term estimates are derived utilizing a similar baseline case, but different modeling techniques and, as a result, are not directly comparable. While point estimates are presented, both mid-term and long-term modeling are dependent upon the methodology and assumptions used. Many of the key variables affecting the benefits estimates are listed as the external factors that could affect expected results in the means and strategy sections of the individual programs and include variables such as: market and policy interactions, and the future price of oil, natural gas and electricity generation. Uncertainties also increase for the longer-term estimates. Long term estimates should be considered preliminary as EERE refines its analytical approaches for the 2030-2050 timeframe. Nonetheless, they provide a useful picture of growing national benefits over time. A summary of the methodologies, sensitivities and assumptions which are important to the development and understanding of these estimates can be found at http: www.eere.energy.gov/office_eere/budget-gpra.html.

These benefits result from the mix of interrelated investments supported by EERE's budget request. More efficient buildings and factories, for instance, provide the basis for distributed energy resources, such as building solar photovoltaic systems and combined heat and power cogeneration

In addition to these "business-as-usual" benefits, EERE's portfolio would provide the technical potential to reduce conventional energy use even further if warranted by future energy needs. The development of wide-spread sources of wind, solar, geothermal, biomass, and hydropower energy sources; new ways of using energy through hydrogen and distributed power; and technologies that would fundamentally improve the basic efficiency of our homes, businesses, factories, and vehicles could allow us, if desired, to make substantially larger reductions in our oil use and convert a larger portion of our electricity system to decentralized capacity and renewable energy sources.

Energy Conservation

Office of Energy Efficiency and Renewable Energy

Funding by Site by Program

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Atlanta Regional Office					
Program Management	2,979	2,915	3,268	+353	+12.1%
Boston Regional Office					
Program Management	2,458	2,405	2,696	+291	+12.1%
Chicago Operations Office					
Ames Laboratory					
Vehicle Technologies	300	300	300	0	0.0%
Argonne National Laboratory (East)					
Vehicle Technologies	20,334	23,173	21,434	-1,739	-7.5%
Fuel Cell Technologies	9,054	8,954	6,890	-2,064	-23.1%
Weatherization and Intergovernmental	600	500	500	0	0.0%
Distributed Energy Resources	775	1,800	775	-1,025	-56.9%
Building Technologies	0	15	0	-15	-100.0%
Industrial Technologies	2,316	2,177	1,081	-1,096	-50.3%
Biomass & Biorefinery Systems R&D	108	0	0	0	0.0%
Program Management	646	643	651	+8	+1.2%
Total, Argonne National Laboratory (East)	33,833	37,262	31,331	-5,931	-15.9%
Brookhaven National Laboratory					
Vehicle Technologies	2,188	1,300	1,150	-150	-11.5%
Fuel Cell Technologies	270	300	300	0	0.0%
Distributed Energy Resources	450	0	0	0	0.0%
Building Technologies	225	903	225	-678	-75.1%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Program Management	273	272	275	+3	+1.1%
Total, Brookhaven National Laboratory	3,406	2,775	1,950	-825	-29.7%
Chicago Operations Office					
Vehicle Technologies	14,166	0	0	0	0.0%
Fuel Cell Technologies	114	0	0	0	0.0%
Biomass & Biorefinery Systems R&D	1	0	0	0	0.0%
Program Management	740	0	0	0	0.0%
Total, Chicago Operations Office	15,021	0	0	0	0.0%
National Renewable Energy Laboratory					
Vehicle Technologies	19,855	18,524	12,114	-6,410	-34.6%
Fuel Cell Technologies	2,094	2,561	3,028	+467	+18.2%
Weatherization and Intergovernmental	4,712	4,718	4,800	+82	+1.7%
Distributed Energy Resources	1,814	1,814	1,814	0	0.0%
Building Technologies	3,105	3,053	3,834	+781	+25.6%
Industrial Technologies	1,796	1,006	138	-868	-86.3%
Biomass & Biorefinery Systems R&D	624	506	506	0	0.0%
Federal Energy Management Program	5,091	4,125	4,125	0	0.0%
Program Management	731	727	736	+9	+1.2%
Total, National Renewable Energy Lab.	39,822	37,034	31,095	-5,939	-16.0%
Total, Chicago Operations Office	92,382	77,371	64,676	-12,695	-16.4%
Chicago Regional Office					
Fuel Cell Technologies	0	50	0	-50	-100.0%
Biomass & Biorefinery R&D	77	0	0	0	0.0%
Program Management	2264	2,216	2,484	+268	+12.1%
Total, Chicago Regional Office	2,341	2,266	2,484	+218	+9.6%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Denver Regional Office					
Biomass & Biorefinery R&D	2	0	0	0	0.0%
Program Management	3,521	3,446	3,863	+417	+12.1%
Total, Denver Regional Office	3,523	3,446	3,863	+417	+12.1%
Golden Field Office					
Vehicle Technologies	0	6,699	0	-6,699	
Fuel Cell Technologies	0	0	0	0	0.0%
Weatherization and Intergovernmental	264,684	267,505	327,240	+59,735	+22.3%
Biomass & Biorefinery Systems R&D	150	250	250	0	0.0%
Program Management	6,002	7,345	9,898	+2,553	+34.8%
Total, Golden Field Office	270,836	281,799	337,388	+55,589	+19.7%
Idaho Operations Office					
Idaho National Engineering & Environmental Laboratory					
Vehicle Technologies	3,395	2,632	3,770	+1,138	+43.2%
Weatherization and Intergovernmental	50	50	50	0	0.0%
Industrial Technologies	1,002	40	190	+150	+375.0%
Biomass & Biorefinery Systems R&D	541	316	316	0	0.0%
Total, Idaho National Engineering & Environmental Laboratory	4,988	3,038	4,326	+1,288	+42.4%
Idaho Operations Office					
Vehicles Technologies	30	0	0	0	0.0%
Program Direction	500	0	0	0	0.0%
Total, Idaho Operations Office	530	0	0	0	0.0%
Total, Idaho Operations Office	5,518	3,038	4,326	+1,288	+42.4%
Livermore Site Office					
Lawrence Livermore National Laboratory					
Vehicle Technologies	2,025	3,242	3,060	-182	-5.6%
Fuel Cell Technologies	425	175	175	0	0.0%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Industrial Technologies	400	335	140	-195	-58.2%
Total, Lawrence Site Office	2,850	3,752	3,375	-377	-10.0%
Los Alamos Site Office					
Los Alamos National Laboratory					
Vehicle Technologies	1,110	670	1,208	+538	+80.3%
Fuel Cell Technologies	5,310	4,959	8,059	+3,100	+62.5%
Building Technologies	0	250	0	-250	-100.0%
Industrial Technologies	1,672	925	678	-247	-26.7%
Total, Los Alamos National Site Office	8,092	6,804	9,945	+3,141	+46.2%
National Energy Technology Laboratory					
Vehicle Technologies	4,910	15,459	33,300	+17,841	+115.4%
Fuel Cell Technologies	300	0	0	0	0.0%
Weatherization and Intergovernmental Activities	680	680	680	0	0.0%
Distributed Energy Resources	1,600	2,400	1,000	-1,400	-58.3%
Building Technologies	600	600	600	0	0.0%
Biomass & Biorefinery Systems R&D	12,152	370	0	-370	-100.0%
Program Management	0	894	0	-894	-100.0%
Total, National Energy Technology Laboratory	20,242	20,403	35,580	+15,177	+74.4%
Nevada Site Office					
Vehicle Technologies	1,619	0	0	0	0.0%
National Nuclear Security Administrations Service Center (NNSA)					
Lawrence Berkeley National Laboratory					
Vehicle Technologies	4,873	5,309	8,051	+2,742	+51.6%
Fuel Cell Technologies	400	450	450	0	0.0%
Weatherization and Intergovernmental	433	700	700	0	0.0%
Distributed Energy Resources	200	200	200	0	0.0%
Building Technologies	10,627	10,290	10,627	+337	+3.3%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Industrial Technologies	1,615	2,050	50	-2,000	-97.6%
Federal Energy Management Program	2,868	2,400	2,400	0	0.0%
Program Management	393	391	395	+4	+1.0%
Total, Lawrence Berkeley National Laboratory	21,409	21,790	22,873	+1,083	+5.0%
NNSA Service Center					
Vehicle Technologies	10,110	0	0	0	0.0%
Fuel Cell Technologies	24,823	0	0	0	0.0%
Total, NNSA Service Center	34,933	0	0	0	0.0%
Total, National Nuclear Security Administration Service Center	56,342	21,790	22,873	+1,083	+5.0%
Oak Ridge Operations Office					
Oak Ridge Institute for Science & Education					
Vehicle Technologies	322	320	0	-320	-100.0%
Oak Ridge National Laboratory					
Vehicle Technologies	40,318	44,279	26,328	-17,951	-40.5%
Fuel Cell Technologies	2,385	2,206	1,758	-448	-20.3%
Weatherization and Intergovernmental	3,720	4,215	4,238	+23	+0.5%
Distributed Energy Resources	27,051	27,522	25,374	-2,148	-7.8%
Building Technologies	5,154	5,152	3,841	-1,311	-25.4%
Industrial Technologies	13,555	11,516	4,140	-7,376	-64.1%
Biomass & Biorefinery Systems R&D	954	160	160	0	0.0%
Program Management	1,139	1,132	1,146	+14	+1.2%
Total, Oak Ridge National Laboratory	94,276	96,182	66,985	-29,197	-30.4%
Oak Ridge Operations Office					
Vehicle Technologies	27,578	25,648	0	-25,648	-100.0%
Federal Energy Management Program	4,068	3,170	3,170	0	0.0%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Program Management	115	0	0	0	0.0%
Total, Oak Ridge Operations Office	31,761	28,818	3,170	-25,648	-89.0%
Total, Oak Ridge Operations Office	126,037	125,000	70,155	-54,845	-43.9%
Philadelphia Regional Office					
Biomass & Biorefinery Systems R&D	50	0	0	0	0.0%
Program Management	2,658	2,601	2,916	+315	+12.1%
Total, Philadelphia Regional Office	2,708	2,601	2,916	+315	+12.1%
Richland Operations Office					
Pacific Northwest National Laboratory					
Vehicle Technologies	6,816	6,347	6,619	+272	+4.3%
Fuel Cell Technologies	2,750	1,200	1,550	+350	+29.2%
Weatherization and Intergovernmental	3,380	3,430	3,400	-30	-0.9%
Distributed Energy Resources	1,200	200	200	0	0.0%
Building Technologies	3,478	3,387	3,478	+91	+2.7%
Industrial Technologies	1,362	1,251	740	-511	-40.8%
Biomass & Biorefinery Systems R&D	760	195	195	0	0.0%
Federal Energy Management Program	2,708	2,419	2,419	0	0.0%
Program Management	810	806	816	+10	+1.2%
Total, Pacific Northwest National	23,264	19,235	19,417	+182	+0.9%
Sandia Site Office					
Sandia National Laboratories					
Vehicle Technologies	7,899	9,119	9,013	-106	-1.2%
Fuel Cell Technologies	25	0	0	0	0.0%
Industrial Technologies	2,891	956	650	-306	-32.0%
Federal Energy Management Program	486	240	240	0	0.0%
Program Management	249	247	250	+3	+1.2%
Total, Sandia Site Office	11,550	10,562	10,153	-409	-3.9%

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	$ Change	% Change
Seattle Regional Office					
Program Management	2,659	2,603	2,917	+314	+12.1%
Washington Headquarters					
Office of Scientific & Technical Information					
Vehicle Technologies	178	50	0	-50	-100.0%
Distributed Energy Resources	45	0	0	0	0.0%
Total, Office of Scientific & Technical Information	223	50	0	-50	-100.0%
Washington Headquarters					
Vehicle Technologies	6,145	14,931	30,309	+15,378	+103.0%
Fuel Cell Technologies	5,956	44,332	55,290	+10,958	+24.7%
Weatherization and Intergovernmental	35,896	26,814	22,459	-4,355	-16.2%
Distributed Energy Resources	26,919	27,087	23,717	-3,370	-12.4%
Building Technologies	35,138	36,216	35,679	-537	-1.5%
Industrial Technologies	70,215	72,812	50,295	-22,517	-30.9%
Biomass & Biorefinery Systems R&D	8,631	5,709	7,253	+1,544	+27.0%
Federal Energy Management Program	4,078	7,362	5,546	-1,816	-24.7%
Program Management	48,813	56,361	49,353	-7,008	-12.4%
Energy Efficiency Science Initiative	2,440	0	0	0	0.0%
Total, Washington Headquarters	244,231	291,624	279,901	-11,723	-4.0%
Total, Washington Headquarters	244,454	291,674	279,901	-11,773	-4.0%
Total, Energy Conservation	880,176	877,984	875,933	-2,051	-0.2%

Site Description

Atlanta Regional Office

Introduction

The Atlanta Regional Office provides support to the R&D programs by administering grants and cooperative agreements to regional, State, and local organizations, both public and private and Provides direction, guidance, and support deployment and outreach programs on a local and regional level. It is located in Atlanta, Georgia.

Program Management

Program Management funds the personnel and overhead costs for 25 FTE in the Atlanta Regional Office (ARO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2) administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). ARO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities.

Boston Regional Office

Introduction

The Boston Regional Office provides support to the R&D programs by administering grants and cooperative agreements to regional, State, and local organizations, both public and private and provides direction, guidance, and support deployment and outreach programs on a local and regional level. It is located in Boston, Massachusetts and supports Program Management.

Program Management

Program Management funds the personnel and overhead costs for 18 FTE in the Boston Regional Office (BRO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2) administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). BRO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities.

Chicago Operations Office

Ames Laboratory

Introduction

Ames Laboratory is located in Ames, Iowa. Ames provides research for Vehicle Technologies in new materials. Ames conducts basic research on new materials with unique properties.

Vehicle Technologies

Ames Laboratory work for FCVT includes the development of low-cost power metallurgy manufacturing methods for particle reinforced aluminum (PRA) composite components. Materials efforts are developing to improve powder for permanent magnets.

Argonne National Laboratory

Introduction

Argonne National Laboratory is located in Argonne, Illinois. It is a multi-discipline laboratory providing support to Vehicle Technologies, Fuel Cell Technologies, Weatherization and Intergovernmental Activities, Distributed Energy Resources, Industrial Technologies, Biomass and Biorefinery Systems R&D, and Program Management.

Vehicle Technologies

Provides simulation, analysis, and develops transient models for hybrid and fuel cell systems. Develops sophisticated software for hardware-in-the loop testing. Provides technical support and analysis for heavy hybrids. Conducts research to reduce parasitic loads on heavy vehicles including reductions in idling losses, rolling resistance, aerodynamic drag, and under hood thermal management. Also, works to improve oil filtration, coolants, and regenerative shocks for trucks. Performs high-performance computing with particular focus on computational fluid dynamics (combustion, underhood cooling, HVAC, etc.). Utilizes the Advanced Photon Source facility to characterize fundamental mechanisms of friction, lubrication, and fuel spray from fuel injectors. Develops nano fluid technology and new designs for higher efficiency heavy vehicle cooling systems. Monitors R&D in industry for underhood electrification for heavy vehicle components and new brake material developments. Provides technical and analytical expertise to the GATE activities. Conducts HEV component and subsystem performance and emissions tests in a state-of-the-art test facility. Validates components and subsystems performance targets for hybrid and fuel cell technology using hardware-in-the loop testing to simulate vehicle operating environment. Develops test procedures for advanced vehicle testing and control strategies to improve overall vehicle efficiency and reduce emissions. Conducts research in energy storage for EVs and HEVs and high performance capacitors. Provides battery technical support, and testing of advanced batteries.

Conducts research and development of in-cylinder emission control techniques for CIDI engines and the evaluation of innovative technologies to reduce emissions and improve fuel efficiencies in heavy-duty diesel engines. Develops wide range of materials (both metals and ceramics), with particular expertise in nondestructive evaluation, rapid prototyping, sensors, and catalysts. Develops economic processes for automotive recycling. Develops permanent magnet materials for high performance motors. Characterizes the effect of microdimpling on reduction of surface friction and wear. Develops lower

temperature, high strength bonding method for ceramics and dissimilar materials. Conducts technology analysis (energy, environmental, and economic) as well as vehicle system and subsystem modeling.

Fuel Cell Technologies

Argonne National Laboratory (ANL) is the lead laboratory in all facets of the research and development of fuel processor catalysts and fuel cell system analysis. ANL provides technical assistance in the management of DOE cooperative agreements with industry. ANL develops catalysts, materials, and processes for the autothermal reforming of gasoline and other fuels including diesel with CO clean-up, investigates the effect of fuel additives on fuel processor performance, and characterizes the stability and degradation of fuel processing catalysts. In FY 2003 and FY 2004, ANL is designing, constructing and optimizing a fast-start fuel processor for on-board gasoline reforming, with support from National Laboratories such as PNNL and ORNL and other fuel cell suppliers. Continuation of ANL fast start fuel processor activities in FY 2005 will depend upon the recommendations of on-board fuel processing go/no-go decision in June 2004.

Weatherization and Intergovernmental Activities

ANL works with engine and platform manufacturers to develop natural gas school buses as part of the Clean Cities platform development effort.

Distributed Energy Resources

ANL performs research and development including non-destructive evaluation (NDE) of advanced ceramics, high temperature recuperators and coatings and laser ignition research for reciprocating engines.

Building Technologies

ANL supports the Building Technology program by assessing the impacts of potential policy choices on building technology markets through the use of market and benefits models, and external analysis.

Industrial Technologies

ANL performs research and development for the Chemical industry R&D area. Argonne provides unique expertise in advanced separations process technologies and new innovative membrane systems. The laboratory also does research on refractory materials for the steel industry. The laboratory also has unique expertise in anode and cathode development for the aluminum industry using technology to analyze the surface effects conditions on the advanced candidate materials.

Biomass and Biorefinery Systems R&D

ANL conducted R&D for the program's Industrial Gasification activity

Program Management

Provide analytical support for major crosscutting issues, such as market and benefit analyses.

Brookhaven National Laboratory

Introduction

Brookhaven National Laboratory (BNL) is located in Upton, New York. It is a multi-discipline laboratory providing support to Vehicle Technologies, Fuel Cell Technology, and Building Technologies.

Vehicle Technologies

Performed analysis studies and conducted research in advanced materials that improved the performance and abuse tolerance of lithium battery systems and provided research support for analysis of internal combustion (IC) engine emissions for FreedomCAR partnership.

Fuel Cell Technologies

Conducts research and development of electrocatalyst alloys for fuel cells focusing on synthesis and characterization of the materials for Fuel Cell Technologies.

Distributed Energy Resources

BNL performs research and development of novel concepts in oil heat combustion and fuel flexibility technologies. This work has lead to proof-of-concept systems and to the acceleration of commercialization and integration of advanced technologies necessary to bring oil heating equipment to their practical potential. These technologies contribute to the combined heat and power initiative.

Building Technologies

BNL conducts research and development activities for the space heating and cooling technologies for Building Technologies.

Program Management

Provides analytical support for crosscutting issues such as market and benefit analyses.

Chicago Operations Office

Introduction

Chicago Operations Office is located in Argonne, Illinois. It provides procurement support, solicited, awarded, and administered research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations. Assisted in the contract awards and administration of general support service contracts. It provides support to Vehicle Technologies, Fuel Cell technologies, and Biomass & Biorefinery Systems R&D.

Vehicles Technologies

Provides procurement support for Vehicle Technologies through solicited, awarded and administered research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations.

Fuel Cell Technologies

The Chicago Operations Office administers the Fuel Cell Technology's Cooperative Agreements with recipients conducting research and development for advanced fuel cell materials and components.

Biomass & Biorefinery Systems R&D

The Chicago Operations Office provides oversight of the program's Industrial Gasification program, which is not funded in FY 2004 or FY 2005.

Program Management

Provides analytical support for crosscutting issues, such as market and benefit analysis.

National Renewable Energy Laboratory

Introduction

National Renewable Energy Laboratory is located in Golden, Colorado. It is a multi-discipline laboratory providing support to Vehicle Technologies, Fuel Cell Technologies, Weatherization and Intergovernmental, Distributed Energy Resources, Building Technologies, Industrial Technologies, Biomass & Biorefinery Systems R&D, Federal Energy Management Program and Program Management.

Vehicle Technologies

Provides analysis of performance targets for light and heavy vehicles, including developing a Technical Targets Tool for government use. Develops system models and provides analysis and simulations of advanced hybrid and fuel cell configurations using the ADVISOR software developed at the lab as well as other tools. Performs trade-off analysis and optimization for fuel cell and other advanced vehicles to identify opportunities for decreased fuel consumption using advanced technology and study the impacts of future fuel cell characteristics on vehicle performance. Provides CAD/CAE for optimized vehicle system solutions in support of FreedomCAR partnership goals, and general engineering assessments of HEV and AFV technologies. Conducts research in reducing ancillary and climate control loads for light vehicles and energy losses in general for both heavy and light vehicles such as rolling resistance, aerodynamics, heat losses, friction, pumping, fuel delivery losses, etc. Investigates and develops advanced battery thermal management for hybrid and fuel cell vehicles. Provides analysis, modeling, and technical support for power electronics and electric machines for heavy vehicles. Conducts engine/vehicle integration and platform studies. Develops component models of engine/after treatment systems to allow for quick and inexpensive evaluations of proposed combinations of fuel/engine/emissions control combinations. Leads an effort to identify the effects of sulfur levels of diesel fuels on near term emissions control devices. Leads an effort to determine the lube oil effects on exhaust after treatment devices. Conducts tests of bio-based diesel fuel blending agents to determine their ability to act as reductants in the exhaust stream of diesel engines. Supports EPAct regulatory programs including Federal Fleet, State and Fuel Provider, Private and Local, and Fuel petitions. Tests and evaluates heavy-duty, medium duty and transit alternative and advanced technology vehicles.

Fuel Cell Technologies

National Renewable Energy Laboratory (NREL) will lead the Systems Integration and Analysis function for the Program. Models of the technical, economic, and integration aspects of the hydrogen infrastructure and fuel cell vehicle systems provide guidance for the development of hydrogen fuel cell vehicles.

Weatherization and Intergovernmental

NREL analyzes the program's communications strategy and develops information outreach products for WIP and specific subprograms. NREL provides technology transfer technical outreach for Rebuild America and Energy Smart Schools. NREL also participates in providing technical assistance in identifying and developing energy policies that will reduce greenhouse gas emissions and contribute to development goals through accelerated deployment of renewable energy and energy efficiency technologies. In addition, NREL works cooperatively with the private sector.

Distributed Energy Resources

NREL conducts research and development of novel material, sensor and processing techniques for advanced desiccant systems for humidity control and improved air quality. NREL also performs analysis addressing regulatory and institutional barriers to distributed energy resources.

Building Technologies

NREL conducts research and development for the following activities in Building Technologies: Building America, and High Performance Buildings

Industrial Technologies

NREL supports the Best Practices program in communication activities and products. NREL supports overall Industry program analysis of the logic of individual program activities including the relationship between program goals, milestones and the budget formulation process for several areas including Industrial Materials of the Future, Aluminum and Metal Casting.

Biomass & Biorefinery Systems R&D

NREL is the lead laboratory for Biomass R&D. NREL also develops analytical methodologies (chemical and life-cycle that are used to facilitate industry commercialization, including economic assessment of technologies). NREL contributes to bio-based products tasks.

Federal Energy Management Program

NREL facilitates projects, develops guidelines and provides expert advice on sustainable and renewable facility designs, green power procurement, distributed energy resources, and alternative financing.

Program Management

Provides analytical support for crosscutting issues, such as market and benefit analyses.

Chicago Regional Office

Program Management funds the personnel and overhead costs for 18 FTE in the Chicago Regional Office (CRO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2)

administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). CRO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities. It also supports Fuel Cell Technologies and Biomass & Biorefinery R&D Programs.

Denver Regional Office

Program Management

Program Management funds the personnel and overhead costs for 21 FTE in the Denver Regional Office (DRO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2) administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). DRO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities. It also provides support to Biomass and Biorefinery Systems R&D.

Golden Field Office

Introduction

Golden Field Office is located in Golden, Colorado. It provides project management and procurement support for Vehicle Technologies, Fuel Cell Technology, Weatherization and Intergovernmental Activities, Biomass and Biorefinery Systems R&D, and Program Management.

Vehicle Technologies

Solicits, awards, and administers support services and research and development contracts, cooperative agreements, and grants. Awards and administers Engine and Emission Control cooperative agreements. Provides technical project management and administrative support for new contracts, cooperative agreements, and grants.

Fuel Cell Technology

The Golden Field Office provides procurement services and technical oversight of the research, development, and demonstration activities conducted by the recipients of Cooperative Agreements.

Weatherization and Intergovernmental Activities

The Golden Field Office (GO) provides funding for energy experts to serve on the industrial technology panels, and with the assistance of the DOE regional offices, awards grants, primarily to States.

Biomass and Biorefinery Systems R&D

The Golden Field Office administers contracts associated with bio-based products R&D and assists HQ with numerous procurement and project management activities.

Program Management

Provides program direction, guidance, and support. Serves as a central Project Management Office (PMO) to EERE. Activities previously performed at other Operations Offices are being consolidated at GFO.

Idaho Operations Office

Idaho National Engineering & Environmental Laboratory

Introduction

Idaho National Engineering Laboratory is located in Idaho Falls, Idaho. It is a multi-discipline laboratory providing support to Vehicle Technologies, Weatherization and Intergovernmental Activities, Industrial Technologies, and Biomass and Biorefinery Systems R&D.

Vehicle Technologies

Develops and assesses advanced oil by-pass filter concepts for heavy vehicles. Develops and assesses ultracapacitors for hybrid vehicles. Tests of high-power batteries and develops battery test procedures. Tests and simulates hybrid vehicle performance. Develops energy storage models for electric and hybrid vehicles (SIMPLEV). Develops and demonstrates spray forming process for rapid production on net-shape molds, dies, and related tooling for automotive components. Models slurry performing for fiber reinforced composites, NDE for cylinder liners, intelligent welding and spray forming of aluminum. Characterizes metallic structures produced by equal channel angular extrusion process. Field testing and evaluation of electric, hybrid and hydrogen light duty vehicles and infrastructure. Supports Federal Fleet acquisition reporting as required.

Weatherization and Intergovernmental Activities

Funding to INEEL supports technical analysis of Inventions and Innovations grant proposals.

Industrial Technologies

The Forest Products Industry provides critical support in project management and analysis as well as Computational Fluid Dynamics (CFD) modeling of an advanced black liquor spray atomization process. For the Steel Industry Vision provides technology support in the development of controlled thermal-mechanical processing (CTMP) of tubes and pipes for enhanced manufacturing performance and in the development and application of laser-assisted arc welding to steel.

Biomass and Biorefinery Systems R&D

INEEL provides biomass-related R&D services and support for the feedstock infrastructure development effort. This work is being conducted in close collaboration with ORNL and NREL.

Idaho Operations Office

Introduction

Idaho Operations Office is located in Idaho Falls, Idaho. It provides procurement support for Vehicle Technologies and Biomass & Biorefinery Systems R&D. Idaho Operations office solicits, awards, and administers research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations and provides contract administration for grants and cooperative agreements. This work is being conducted in close collaboration with ORNL and NREL. It provides support to Vehicle Technologies, Biomass & Biorefinery Systems R&D, and Program Direction.

Vehicles Technologies

Idaho Operations Office solicits, awards and administers research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations and provides contract administration for grants and cooperative agreements for university research for FreedeomCar.

Program Management

In FY 2003, Idaho Operations Office supports program implementation and project management. In FY 2004, those functions were transferred to the Golden Field Office.

Livermore Site Office

Lawrence Livermore National Laboratory

Introduction

Lawrence Livermore National Laboratory is located in Livermore, California. It is a multi-discipline laboratory providing support to Vehicle Technologies, Fuel Cell Technology, and Industrial Technologies.

Vehicle Technologies

Provides leadership and coordination in the application of advanced methods of conventional fluid dynamics to aerodynamic drag of heavy vehicle for increased energy efficiency. Performs research on ICE combustion using simulation and modeling to reduce NOx in lean-burn engines and develops microwave regeneration components and design tools for emission controls. Performs R&D to discover and develop next-generation emissions-control catalysts for lean burn engines and the development of technology for onboard generation of chemical reductants from diesel fuel. Performs studies of combustion under diesel and homogeneous charge compression ignition (HCCI) conditions using chemical kinetic modeling and other methods to determine means for increasing fuel efficiency, reducing emissions, and increasing peak output power. Research is directed at materials development and advanced automotive manufacturing concepts, such as metal treatment using Plasma Surface Ion Implantation (PSII) and development of low-cost aluminum sheet. Develops high-voltage, dielectric ultracapacitors based on nanostructure multilayer oxide materials. Develops aerogel-based NOx catalysts for CIDI engines. Nondestructive evaluation and in-line sensors for the design and product

optimization of cast light metals. Applies equal channel angular extrusion to the fabrication of amorphous metallic materials for magnet applications. Chemical kinetic modeling of in-cylinder combustion process of advanced HCCI engine technology as it applies to natural gas engines.

Fuel Cell Technology

Lawrence Livermore National Laboratory (LLNL) is constructing and testing hydrogen and carbon monoxide sensors, both for safety and for fuel stream monitoring in a fuel cell vehicles.

Industrial Technologies

Lawrence Livermore National Laboratory provides technology support to the Forest and Paper Products Vision in the development and testing of a Linescan camera system for imaging and measuring moisture content and in the development and testing of a guided acoustic wave monitoring to measure boiler corrosion to reduce boiler downtime and improve operating efficiency.

Los Alamos Site Office

Los Alamos National Laboratory

Introduction

Los Alamos National Laboratory is located in Los Alamos, New Mexico. It is a multi-discipline laboratory providing support to Vehicle Technologies, Fuel Cell Technology, and Industrial Technologies.

Vehicle Technologies

Performs research on ICE combustion using simulation and modeling to reduce NOx in lean-burn engines and developing microwave regeneration components and design tools for emission controls. Los Alamos is also performing R&D to discover and develop next-generation emissions-control catalysts for lean burn engines and the development of technology for onboard generation of chemical reductants from diesel fuel.

Fuel Cell Technology

Los Alamos National Laboratory (LANL) serves as the lead laboratory in research and development of fuel cell components, reduction of precious metal loading while maintaining performance, and characterization of the poisoning of fuel cell catalysts by impurities in air and fuel feeds. To facilitate heat rejection and improve CO tolerance of membrane electrode assemblies, LANL is leading a major effort to design, synthesize, and characterize membranes which operate at high temperatures, 120c for transportation applications and above 150c for stationary applications. Development of direct methanol fuel cells at LANL will accelerate high-volume manufacturing processes for fuel cells. LANL is developing CO sensors to allow optimization of operating efficiencies of fuel processors and PEM fuel cells with the use of control systems. LANL is characterizing the durability of fuel cell stacks operating on both hydrogen and on reformat (targets are 5,000 hours for transportation applications and 40,000 hours for stationary applications), since the durability of fuel cell stacks has not been demonstrated. LANL is also characterizing the effects of fuel composition on fuel processor performance.

Building Technologies

Los Alamos National Laboratory conducts research and development for activities in the Building Technologies program.

Industrial Technologies

Los Alamos National Laboratory (LANL) supports program work for the Chemical industry R&D area. The laboratory provides unique capabilities in theoretical scientific analysis modeling fluid flows and understanding chemical reactions and catalysis phenomena. LANL provided the computer analysis of industrial fluid flows, and the computer technology prepared for use by the civilian sector. LANL also supports the Industrial Materials of the Future activities in the development of new materials for membrane separation systems.

National Energy Technology Laboratory

Introduction

National Energy Technology Laboratory is located in Morgantown, West Virginia. It provides project management and procurement support to FreedomCAR, Fuel Cell Technology, Weatherization and Intergovernmental Activities, Distributed Energy Resources, and Building Technologies.

Vehicle Technologies

Awarded and administered Emission Control cooperative agreements. Lead an effort to develop a mechanism to remove sulfur from diesel fuel on board the vehicle and effectively reduce sulfur levels from 15 ppm to essentially zero.

Fuel Cell Technologies

National Energy Technology Laboratory (NETL) carries out research on diesel fuel processing, specifically looking at component modeling in cooperation with experimental diesel reforming efforts at other National Laboratories.

Weatherization and Intergovernmental Activities

National Energy Technology Laboratory (NETL) provides technology transfer technical outreach, grants management system development, and tools development for many WIP activities.

Distributed Energy Resources

National Energy Technology Laboratory (NETL) manages the university program that supports the advanced reciprocating engine program and performs in-house R&D for that program. NETL also provides project management and procurement support.

Building Technologies

National Energy Technology Laboratory (NETL) conducts research and development for activities in appliance standards and the Building Technologies competitive solicitation.

Biomass & Biorefinery Systems R&D

National Energy Technology Laboratory (NETL) conducts R&D and manages industry subcontracts for the Industrial Gasification activity.

Program Management

Program Management funds NETL to provide project management for Distributed Energy R&D activities in FY 2004.

Nevada Site Office

Introduction

Nevada Site Office is located in located in Las Vegas, Nevada. It provides technical and management assistance for the Hydrogen Technology Program. Nevada Site Nevada Site Office provides support to Vehicle Technologies.

Vehicle Technologies

Office provides technical and management assistance to develop an integrated hydrogen refueling station in Nevada, including coordination with the Department of Transportation.

NNSA Service Center

Lawrence Berkeley National Laboratory

Introduction

Lawrence Berkeley National Laboratory is located in Berkeley, California. It is a multi-discipline laboratory providing support to FreedomCAR, Fuel Cell Technology, Weatherization and Intergovernmental Activities, Distributed Energy Resources, Building Technologies, Industrial Technologies, and Federal Energy Management Program.

Vehicle Technologies

Conducts exploratory research in advanced battery technology, including development of new electrode and electrolyte materials and understanding of fundamental electrochemical phenomena. Develops device to measure particulate matter from engines. Develops nondestructive testing techniques for evaluation of aluminum and composite structures in manufacturing environments.

Fuel Cell Technology

Lawrence Berkeley National Laboratory (LBNL) develops electrocatalysts for membrane electrode assemblies with the goal of increasing understanding of fundamental electrochemical phenomena.

Weatherization and Intergovernmental Activities

Lawrence Berkeley National Laboratory (LBNL) provides technology transfer technical outreach for Rebuild America and EnergyStar.

Distributed Energy Resources

Lawrence Berkeley National Laboratory (LBNL) will perform analysis tasks to quantify benefits of distributed generation technologies to the customer, the system and the Nation.

Building Technologies

Lawrence Berkeley National Laboratory (LBNL) conducts research and development for the following activities in lighting, windows, appliance standards, analysis tools and design strategies and space heating and cooling.

Industrial Technologies

The Lawrence Berkeley National Laboratory (LBNL) supports technology delivery activities of the Best Practices program including assistance in facilitating Allied Partners with supplier industry organizations (e.g. Hydraulic Institute, Compressed Air and Gas Institute). The laboratory supports the tracking of Best Practices implementation results including the impact of training, software tools and other program delivery mechanisms on manufacturing plants.

Federal Energy Management Program

LBNL facilitates projects, develops guidelines and provides expert advice on the monitoring and verification protocols for energy projects savings, laboratory sustainable design principles, public benefit funds, and lighting.

Program Management

Provide analytical support for major crosscutting issues, such as market and benefit analyses.

National Nuclear Security Administrations Service Center (NNSA)

Introduction

NNSA Service Center in Albuquerque, New Mexico. It provides procurement support for EERE programs.

Vehicle Technologies

Solicits, awards, and administers research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations. Provides research in full scale aerodynamic stability tests for heavy vehicles.

Fuel Cell Technologies

NNSA administers some previously awarded Fuel Cell Technology Subprogram's Cooperative Agreements with recipients conducting research and development for advanced fuel cell materials and components.

Oak Ridge Operations Office

Oak Ridge Institute for Science and Education

Introduction

Oak Ridge Institute for Science and Education is located in Oak Ridge, Tennessee. It provides technical support for FreedomCAR and Vehicle Technologies. Oak Ridge Institute for Science and Education plans technical meetings and conducts peer reviews. In addition, it organizes, plans and conducts scientific workshops to engage industry with the scientific community in the national labs.

Vehicle Technologies

Organizing, planning and conducting scientific workshops to engage industry with the scientific community in the national labs.

Oak Ridge National Laboratory

Introduction

Oak Ridge National Laboratory is located in Oak Ridge, Tennessee. It is a multi-discipline laboratory providing support to FreedomCAR and Vehicle Technologies, Fuel Cell Technology, Weatherization and Intergovernmental Activities, Distributed Energy Resources, Building Technologies, Industrial Technologies, Biomass and Biorefinery Systems R&D, and Program Management.

Vehicle Technologies

Develops models to estimate cost of advanced hybrid and fuel cell vehicles to perform trade-off studies, and also develops models to predict emissions from advanced after-treatment devices. Conducts research to develop high thermal conductivity carbon foams for high performance truck and automobile radiators. Conducts analysis, technical support, testing and research on power electronic devices and electric machines. Conducts research and provides technical/project management support in propulsion and vehicle system materials. Develops material analytical techniques and material related solutions for automotive and heavy vehicle systems. Conducts research in internal combustion engine technologies, in-cylinder diagnostics (such as application of chaos theory and emission studies), and exhaust after treatment (including catalytic converter research, development, and testing). Develops an understanding of NOx adsorber processes affecting regeneration, desulfation, and degradation under real-world conditions. Provides detailed characterization and speciation of combustion and emission products. Using primarily laboratory reactors and some engine experiments, acquired kinetic data for the development of computer models of after treatment devices. Evaluates the toxicity of unregulated emissions that are present in the exhaust streams of engines operating on advanced fuels. Leads an effort to evaluate the fuel effects on selective catalytic reduction systems on diesel engines. Evaluates the critical fuel properties that effect near term emissions control devices for diesel engines. Determines the effects and the mechanism of lube oil suspended phosphorous on the poisoning of exhaust catalysts in diesel engines. Evaluates the benefits of the use of e-diesel fuels in combination with high exhaust gas re-circulation rates in diesel engines. Conducts analysis, technical support, testing and research on power electronic devices and electric machines.

Fuel Cell Technology

Oak Ridge National Laboratory (ORNL) is the primary lab for materials R&D aimed at reducing the weight and cost of fuel cell components. ORNL carries out R&D on bipolar plates, membrane characterization, hydrogen sulfide reduction, temperature sensors, and it develops high-thermal-conductivity graphite foam for fuel cell humidification and heat exchangers.

Weatherization and Intergovernmental Activities

ORNL provides a wide variety of technical and program analysis activities for WIP. Examples include: residential energy audit and advanced weatherization measure analysis, Rebuild America technology transfer technical outreach, policy analysis for EnergyStar, and market assessments of new technologies to Gateway partners.

Distributed Energy Resources (DER)

ORNL is the primary lab for DER technology development and end-use systems integration. ORNL conducts research and development in advanced materials and sensors for industrial gas turbines and microturbines, advanced reciprocating engines, thermally activated technologies, and combined heat and power (CHP). To conduct this research, ORNL leverages state-of-the-art, unique resources such as the High Temperature Materials Laboratory (HTML) User Center, the Building Technology User Center, and the CHP Integration User Center.

Building Technologies

ORNL is part of a national laboratory/industry/university consortium conducting research and development for the following activities in Building America, space heating and cooling, envelope and emerging technologies.

Industrial Technologies

In support of the Best Practices effort, Oak Ridge National Laboratory (ORNL) provides support to the Plant-Wide Assessments and technical assistance and also the tracking of program impacts. They also help in the development and delivery of software tools and training. ORNL is the primary laboratory supporting the Industrial Materials of the Future activities to develop advanced materials for industrial use that meet technical requirements identified by industry in the visions and technology roadmaps. ORNL's defense computational capabilities were applied in conjunction of the National Renewable Energy Laboratory in the analysis of high-temperature fluid flows.

Biomass and Biorefinery Systems R&D

Oak Ridge National Laboratory (ORNL) conducts gasification and other biomass technologies R&D.

Program Management

Provide analytical support for major crosscutting issues, such as market and benefit analyses.

Oak Ridge Operation Office

Introduction

Oak Ridge Operations Office is located in Oak Ridge, Tennessee. Solicits, awards, and administers research and development contracts, cooperative agreements, and grants with industry, academia, and other Government organizations. It provides support to Vehicle Technologies, Federal Energy Management and Program Management.

Vehicle Technologies

Provides procurement support for Vehicle Technologies. Performs contractual administration of competitively awarded cooperative agreement for projects to develop and demonstrate diesel engine emissions reduction technology and to develop components suitable for light truck engine development for Vehicle Technologies. Manages, collects data, and reports on field activities of the DOE sponsored feet testing of electric and hybrid vehicles.

Federal Energy Management

Oak Ridge National Laboratory facilitates projects, develops guidelines, and provides expert advise on combine heat and power systems, biomass opportunities, whole building design, and alternative financing.

Program Management

Provide analytical support for major crosscutting issues, such as market and benefit analyses.

Philadelphia Regional Office

Program Management funds the personnel and overhead costs for 18 FTE in the Philadelphia Regional Office (PRO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2) administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). PRO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities. It also provides support for energy projects involving states on behalf of Biomass & Biorefinery Systems R&D.

Richland Operations Office

Pacific Northwest National Laboratory

Introduction

Pacific Northwest National Laboratory is located in Richland, Washington. It is a multi-discipline laboratory providing support to FreedomCAR and Vehicle Technologies, Fuel Cell Technology, Weatherization and Intergovernmental Activities, Distributed Energy Resources, Building

Technologies , Industrial Technologies, Biomass and Biorefinery Systems R&D, Federal Energy Management Program and Program Management.

Vehicle Technologies

Conducts research on predictive cruise control for heavy vehicles to increase energy efficiency. Evaluates advanced energy storage materials. Develops experimental and analytical methods to measure and improve technologies to reduce exhaust emissions and studying materials for lean-burn, high-durability NOx sensors. Work includes the development of efficient and effective plasma assisted lean NOx reduction for both light- and heavy-duty diesel engines while minimizing vehicle fuel economy penalty. Works to facilitate the scale-up process for depositing Si/SiGe superlattices, materials used in the development of thermoelectric devices for recovering waste heat in diesel engines thus improving fuel efficiency. Develops energy efficient production for magnesium, titanium, polymer composite and glass components for advanced automotive and heavy vehicle designs. Studies materials for lean-burn, high-durability spark plugs. Develops environmentally friendly processes for the manufacture of planar thin film ceramic sensors. Creates a Northwest Alliance to develop lightweight materials processing technologies. Develops and tests a lightweight SUV frame prototype with performance equal to conventional steel components. Designs hybrid composite materials for weight critical heavy vehicle structures.

Fuel Cell Technology

Pacific Northwest National Laboratory (PNNL) develops compact, microchannel fuel reformer components. Microchannel technology offer heat rejection and mass transfer advantages allowing PNNL to reduce the size and weight of fuel processing components such as heat exchangers, steam reformers, water gas shift reactors, and preferential oxidation subsystems. PNNL is developing a model and a controller for solid oxide fuel cells to be used with APUs. Shock and vibration characteristics applied to SOFC stacks and APU units during operation are being developed in the model.

Weatherization and Intergovernmental Activities

Pacific Northwest National Laboratory (PNNL) provides technology transfer technical assistance for Gateway partners and tools and materials development, analysis tool development, training, and technical assistance related to new State building energy codes.

Distributed Energy Resources

Pacific Northwest National Laboratory (PNNL) is assisting in carrying out regulatory education and outreach. The lab is providing assistance in efforts to remove regulatory barriers to distributed generation.

Building Technologies

The Pacific Northwest National Laboratory (PNNL) conducts research and development activities for the following activities in building codes, appliance standards and emerging technologies.

Industrial Technologies

In support of the Industries of the Future (Specific) and (Crosscutting) activities Pacific Northwest National Laboratory provides key support to track past program impacts including the over 150 commercial technologies, and their energy and environmental impacts. Other efforts include the

evaluation of emerging technologies. The laboratory produces an Impacts report summarizing commercial and emerging technologies and past program results and methodologies. The laboratory also performs support to Mining, Aluminum, Sensors and Controls, Glass, Industrial Materials of the Future and Forest Products.

Biomass and Biorefinery Systems R&D

The Pacific Northwest National Laboratory conducts R&D in support of the development of the syngas platform and related products. Major program components include thermocatalysts for fuels and chemicals and wet biomass for syngas production.

Federal Energy Management Program

PNNL develops guidelines and provides expert advice on energy efficient buildings maintenance and operations, utility load management, utility restructuring, building commissioning, building diagnostic systems, and resource energy management.

Program Management

Provide analytical support for major crosscutting issues, such as market and benefit analyses.

Sandia Site Office

Sandia National Laboratories

Introduction

Sandia National Laboratories is located in Albuquerque, New Mexico. It is a multi-discipline laboratory providing support to FreedomCAR, Industrial Technologies, and Federal Energy Management Program.

Vehicle Technologies

Participates in the modeling and simulation for reduction of heavy vehicle aerodynamic drag. Conducts research on new, rugged high temperature film capacitors for power electronics. Conducts and evaluates electrode materials that would improve abuse tolerance of lithium based battery technologies. Performs abuse tests of various battery technologies. Conducts extensive fundamental research on piston engine combustion processes to reduce emissions formation while maintaining efficiency. Investigates optical and non-optical medium-duty HCCI engines and in an optically accessible light-duty gasoline engine. Developing laser diagnostics are to measure diesel particulate matter concentration, size, morphology, and metallic ash content, measurements vital to the successful development of robust diesel exhaust after treatment systems. Materials R&D to improve the performance of tires, engines, and automotive body structures. Analysis and laboratory demonstration of improved manufacturing techniques and instrumentation for forging, heat treatment, coating, welding, and other factory processes. Studies the in-cylinder combustion processes of fuel born oxygen in diesel fuels using laser induced incandescence observations.

Fuel Cell Technologies

The Sandia Site Office manages fuel cell research and development.

Industrial Technologies

Sandia's unique capabilities have been applied to the Chemical industry R&D activities. These capabilities include research on prototype chemical reactors, research on molecular properties using Sandia's unique computational capabilities, research on industrial separations membranes, and the development of an experimental fluid flow system used to measure properties of chemical reacting flows in greater detail than had previously been achieved. This experimental fluid flow research activity was carried in cooperation with LANL, the PNNL, four U.S. universities, and eight U.S. petroleum and chemical companies.

Federal Energy Management Program

SNL develops guidelines and provides expert advice on renewable technologies for military applications and on distributed generation

Program Management

Provides analytical support for crosscutting issues such as market and benefit analyses.

Seattle Regional Office

Program Management funds the personnel and overhead costs for 19 FTE in the Seattle Regional Office (SRO) in order to provide: (1) promotion of EERE programs at the local and regional levels; (2) administration of grants to, and cooperative agreements with, States and local governments (particularly the Weatherization Assistance Program and State Energy Program grants); and (3) administration and implementation of locally- and regionally-focused deployment activities, such as Clean Cities, Rebuild America, and the Federal Energy Management Program (FEMP). SRO will also occasionally receive small amounts of direct funding from individual R&D or deployment programs to perform specific tasks - such as managing a cooperative or inter-agency agreement, arranging a conference, or other locally-oriented activities.

Washington Headquarters

Office of Scientific and Technology Information (OSTI)

Introduction

Office of Scientific and Technical Information is located in Oak Ridge, Tennessee. It provides technical support for FreedomCAR and Vehicle Technologies and Distributed Energy Resources.

Vehicle Technologies

Disseminates heavy vehicle technical reports and literature. Assists in conducting industry/Government workshops in support of Multi-Year Program Planning efforts.

Distributed Energy Resources

Assists Distributed Energy technology development and end-use systems integration. Conducts research and development in advanced materials and sensors for industrial gas turbines and

microturbines, advanced reciprocating engines, thermally activated technologies, and combined heat and power (CHP). To conduct this research, OSTI leverages state-of-the-art unique resources.

Washington Headquarters

Introduction

Washington, D.C. is the headquarters for the Office of Energy Efficiency and Renewable Energy operations. The Headquarters operations provides specialized, technical expertise in planning, formulation, execution, and evaluation, in order to support the responsible guidance and management of the budget. It provides support to Vehicle Technologies, Fuel Cell Technologies, Weatherization and Intergovernmental, Distributed Energy Resources, Building Technologies, Industrial Technologies, Biomass & Biorefinery Systems R&D, Federal Energy Management Program, Program Management, and Energy Efficiency Science Initiative.