The FY 2006 Budget Request

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FY 2006 Budget Request

- Supports Presidential commitment to strengthen energy security and enhance energy choices for all Americans while protecting the environment
- Builds upon and sustains a record of success
  - Research & Development (R&D)
  - Deployment
  - Management
- Continues trend of budget requests in the $1.2 billion range

Budget Request is Priority Driven

1. Dramatically reduce or even end dependence on foreign oil
2. Reduce the burden of energy prices on the disadvantaged
3. Increase the viability and deployment of renewable energy technologies
4. Increase the reliability and efficiency of electricity generation and use
5. Increase the energy efficiency of buildings and appliances
6. Increase the energy efficiency of industry
7. Spur the creation of a domestic bio-industry
8. Lead by example through government's own actions
9. Continuously improve the way EERE does business

What's New in the FY 2006 Request?

- Accelerating and expanding research on the production of hydrogen from renewables (+$18.0 million*)
- Expanding hydrogen safety research to provide the underpinnings for codes and standards (+$7.2 million*)
- Expanding capability for systems analysis of hydrogen pathways, assessing energy, environmental and economic impacts of hydrogen energy systems (+$3.7 million*)
- Placing an emphasis on accelerating offshore wind power technology research (+$5.1 million*)
- Increasing emphasis on renewable and synthetic fuels utilization to better understand technical barriers to blending non-petroleum components into refinery-produced, petroleum- based fuels for use in advanced combustion regime engines (+4.4 million*)

*Funding increases represent the difference between the FY 2006 request and the FY 2005 appropriation for this activity.

What's New in the FY 2006 Request?

- Increasing emphasis on utilization of platform outputs R&D in the Biomass Interior request, thereby increasing the effectiveness and efficiency of biorefineries through optimal integration of enhanced processes for bio-based products. (+14.3 million*)
- Beginning Collaborative Crystalline Silicon PV Initiative to strengthen through R&D the technological competitiveness of U.S. products in a rapidly growing world market.(+$4.5 million*)
- Shifting Industries' portfolio strategy to multi-industry next-generation R&D requiring high-risk investment to achieve much lower energy use than current processes
- Transferring EERE's successful hydropower turbine R&D and water management techniques to industry and closing-out EERE's hydropower work

*Funding increases represent the difference between the FY 2006 request and the FY 2005 appropriation for this activity.

More Importantly

EERE is Linking Its Budget with Performance

"Government likes to begin things—to declare grand new programs and causes and national objectives. But good beginnings are not the measure of success. What matters in the end is completion. Performance. Results. Not just making promises, but making good on promises. In my Administration, that will be the standard from the farthest regional office of government to the highest office of the land."

George W. Bush

EERE's funding is achieving results…

Advancing EERE Technologies Through R&D

Sample of EERE's Ten 2004 "R&D 100" Award Winners

Soldiers, homeowners, and campers are the benefactors of this lightweight, mobile power source made of thin-film Copper Indium Gallium diSelenide (CIGS) photovoltaic (PV) modules, developed by researchers at the National Renewable Energy Laboratory, Golden, Colo., and Global Solar Energy, Tucson, Ariz.

Researchers at Lawrence Berkeley National Laboratory have formulated a unique type of Transition Metal Switchable Mirror (TMSM) coating for "smart windows" that boast a 22-42% gain in energy savings performance over other low emissivity glazings.

Researchers at Oak Ridge National Laboratory developed an advanced heating system for high-performance aluminum forgings that uses less energy than conventional techniques.

Moving Closer to a Hydrogen Economy

One Accomplishment at a Time

- R&D Advances
  - Reduced the high-volume cost of automotive fuel cells from $275/kW (2002) to $200/kW (2004) using innovative processes developed by national labs and fuel cell developers for depositing platinum catalyst
  - Reduced the cost of natural gas-based hydrogen production from $5.00 per gallon gasoline equivalent (gge) in 2003 to $3.60 per gge (2004) using innovative reforming and purification technologies

- Shell Opens a Hydrogen Refueling Station in DC
  - Site will be used to refuel General Motors' fuel cell vehicles in DOE's Vehicle and Infrastructure Learning Demonstration and Validation Project
  - This will be the first station to be deployed in a potential Washington, D.C. to New York hydrogen corridor

- One-Year anniversary of the International Partnership for the Hydrogen Economy (IPHE)
  - 15 nations and the European Commission signed the Terms of Reference establishing the IPHE on November 20, 2003
  - Mechanism to organize and implement effective, efficient, and focused international research, development, demonstration and commercial utilization activities related to hydrogen and fuel cell technologies

Partnering with Industry for Success

FreedomCAR and Fuel Partnership

- BP America
- ChevronTexaco Corporation
- ConocoPhillips
- Exxon Mobil Corporation
- Shell Hydrogen (U.S.)
- U.S. Council for Automotive Research (USCAR)
- DaimlerChrysler Corporation
- Ford Motor Company
- General Motors Corporation
- U.S. Department of Energy

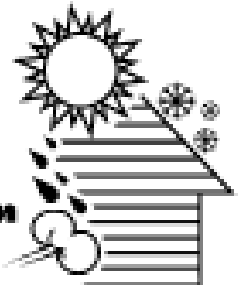
Deploying EERE Technologies in Strategic Markets

Sample of EERE's Deployment Activities

ENERGY STAR

Last year alone, Americans, with the help of ENERGY STAR, saved enough energy to power 20 million homes and avoid greenhouse gas emissions equivalent to those from 18 million cars - all while saving $8 billion.

Weatherization Assistance Program



Over 375,000 low-income homes have been weatherized in the last 4 years, helping families reduce their annual energy bills by an average of $237 per household at current energy prices.

Rebuild America
U.S. Dept. of Energy

Last year Rebuild America upgraded 70 million square feet of floor space in public schools and other facilities through new and existing partnerships, reducing the average energy used in these buildings by 18%.

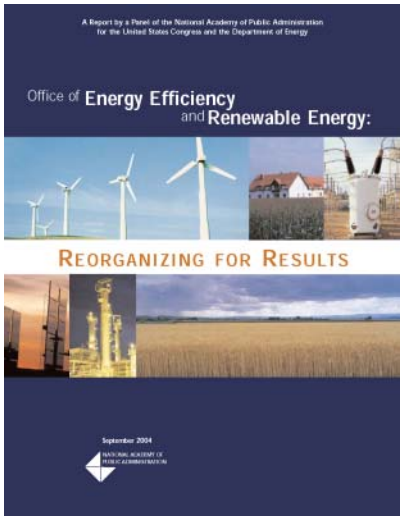
Clean Cities
U.S. Department of Energy

Clean Cities has put more than 407,000 alternative fuel vehicles on the road since its inception in 1993 by working with stakeholders across the country, resulting in the displacement of approximately 346 million gallons of gasoline and diesel fuel each year.

Improving the Way EERE Does Business

NAPA's Review of EERE's Reorganization

- In August 2004, the National Academy of Public Administration (NAPA) concluded an 18-month congressionally directed review of EERE's innovative business and management model
- Panel concluded that "EERE has made great strides to reinvent how it does business"



- Final NAPA report stated: "EERE has demonstrated that much can be achieved in a relatively short period of time if top management is committed to doing so"

A Closer Look at the Budget Request

Energy Conservation

(dollars in thousands)

	FY 2004 Comparable Appropriations	FY 2005 Comparable Appropriations	FY 2006 Request	FY 2006 Request vs. FY 2005 Approp.
Vehicle Technologies	172,395	165,409	165,943	534
Fuel-Cell Technologies	63,782	74,944	83,600	8,656
Weatherization and Intergovernmental				
Weatherization Assistance Grants	227,166	228,160	230,000	1,840
State Energy Program Grants	43,952	44,176	41,000	(3,176)
State Energy Activities	2,324	2,320	500	(1,820)
Gateway Deployment	34,490	34,349	26,657	(7,692)
Total, Weatherization and Intergovernmental	307,932	309,005	298,157	(10,848)
Distributed Energy Resources	59,684	60,416	56,629	(3,787)
Building Technologies	57,799	65,464	57,966	(7,498)
Industrial Technologies	90,450	74,801	56,489	(18,312)
Biomass and Biorefinery Systems R&D	6,966	7,253	21,805	14,552
Federal Energy Management Programs	19,420	17,931	17,147	(784)
Program Management	92,362	93,011	89,036	(3,975)
Subtotal, Energy Conservation	870,790	868,234	846,772	(21,462)
Use of prior-year balances	(2,823)	-	-	-
Total, Energy Conservation	867,967	868,234	846,772	(21,462)

A Closer Look at the Budget Request

(dollars in thousands)

Energy Supply	FY 2004 Comparable Appropriations	FY 2005 Comparable Appropriations	FY 2006 Request	FY 2006 Request vs. FY 2005 Approp.
Hydrogen Technology	80,412	94,006	99,094	5,088
Solar Energy	80,731	85,074	83,953	(1,121)
Wind Energy	39,803	40,804	44,249	3,445
Hydropower	4,673	4,862	500	(4,362)
Geothermal Technology	24,625	25,270	23,299	(1,971)
Biomass and Biorefinery Systems R&D	84,608	80,846	50,359	(30,487)
Intergovernmental Activities	14,673	16,776	11,910	(4,866)
Renewable Program Support	8,493	5,954	2,901	(3,053)
Departmental Energy Management Program	1,963	1,951	2,019	68
Facilities and Infrastructure	12,950	11,389	16,315	4,926
Program Direction	16,490	19,064	19,043	(21)
Subtotal, Energy Supply	369,421	385,996	353,642	(32,354)
Use of prior-year balances	(17,126)	(5,648)	-	5,648
Total, Energy Supply	352,295	380,348	353,642	(26,706)

EERE Program Details

FY 2006 Budget Request

President's Hydrogen Fuel Initiative FreedomCAR Program

Budget

Funding (dollars in thousands)			
Office	**FY04 Comparable Approp.**	**FY05 Comparable Approp.**	**FY06 Request**
Hydrogen Fuel Initiative			
EERE	144,194	168,950	182,694
Fuel Cells	63,782	74,944	83,600
Hydrogen	80,412	94,006	99,094
FE	4,879	17,085	22,000
NE	6,201	8,929	20,000
SC	0	29,183	32,500
DOE total	155,274	224,147	257,194
DOT	555	549	2,350
HFI Total	**155,829**	**224,696**	**259,544**
FreedomCAR			
EERE/vehicles	**86,653**	**85,282**	**100,400**
FC-HFI Total	**242,482**	**309,978**	**359,944**

Key Activities

- Focus hydrogen storage R&D on metal hydrides, carbon and chemical hydrides, through 3 "Centers of Excellence" with 20 university, 8 industry & 9 federal lab partners (EERE).
- Expand basic science on nanomaterials for storage, biological and solar hydrogen production (SC).
- Coordinate with DOT, NIST and EPA on enhanced safety research to provide the underpinnings for codes and standards (EERE).
- Expand capability for systems analysis of hydrogen pathways, assessing energy, environmental and economic impacts of hydrogen energy systems (EERE).
- Expand exploratory battery research, which is a critical component for hybrid propulsion (EERE).
- Accelerate and expand research on the production of hydrogen from renewables (EERE), nuclear (NE) & coal (FE).
- Accelerate robust effort in hybrid technologies for combustion and fuel cell hybrid powertrains (EERE).

Hydrogen, Fuel Cells & Infrastructure Technologies

Program Focus: Research, develop, and validate fuel cell and hydrogen production, delivery, and storage technologies for transportation and stationary applications.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Fuel Cell Technologies (Energy Conservation)			
Transportation Systems	7,317	7,495	7,600
Distributed Energy Systems	7,249	6,902	7,500
Systems (formerly Transportation and Distributed Energy Systems)			
Stack Component R&D	24,551	32,541	34,000
Fuel Processor R&D	14,442	9,721	9,900
Technology Validation	9,828	17,750	24,000
Technical/Program Management Support	395	535	600
Hydrogen Technology (Energy Supply)			
Production & Delivery R&D	10,083	14,218	32,173
Storage	13,174	23,654	29,890
Infrastructure Validation	5,784	9,484	14,945
Safety and Codes and Standards (Safety, Codes & Stds. & Utilization)	5,615	5,954	13,121
Education (formerly Systems Analysis and Education)	2,417		1,881
Systems Analysis and Education	1,372	3,404	7,084
Congressionally Directed Activities	41,967	37,292	
Total	144,194	168,950	182,694

Key Activities

- Reduce 50kW vehicle fuel cell system cost to $110/kW (high volume production) toward achieving 2010 goal of $45/kW.
- Conduct “learning demonstrations” with auto & energy industry:
  - Validate 1000 hours fuel cell durability.
  - Open 8 fueling stations & validate current hydrogen cost with renewables and natural gas.
- Improve electrical efficiency for natural gas/propane fueled 50-250 kW stationary fuel cell system to 34 % at full power.
- Down-select carbon nanotube technologies based on 6 wt.% hydrogen storage capacity to meet go/no go decision.
- Develop electrolyzer technologies with 64% energy efficiency, towards meeting 2010 target of $2.85/gge.
- Develop fuel flexible reformers (natural gas/renewable liquids), fast-reacting reformer catalysts and efficient compressors.
- Correlate safety experiments and models of hydrogen leakage.
- Complete pathways analyses of at least 5 transition scenarios for electrolysis and natural gas reforming.

FreedomCAR and Vehicle Technologies

Program Focus: Enable America to use less petroleum through research and development of technologies to improve the energy efficiency of cars and trucks.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
FreedomCAR and Vehicle Technologies (Energy Conservation)			
Vehicle Systems	13,875	13,349	13,788
Innovative Concepts	494	494	500
Hybrid and Electric Propulsion	43,390	45,238	48,821
Advanced Combustion Engine R&D	52,736	49,756	41,148
Materials Technology	38,622	37,001	38,225
Fuels Technology	15,887	12,750	13,647
Technology Introduction	4,802	4,944	6,314
Technical/Program Management Support	2,095	1,877	2,500
Biennial FreedomCAR Peer Review	494	-	1,000
Total	172,395	165,409	165,943

Key Activities

- Fund new competitive awards for advanced combustion regimes with the potential for very high efficiencies and near zero emissions.
- Expand R&D of fuel formulations enabling advanced combustion regimes.
- Expand research for the recovery of energy from waste heat using advanced thermoelectric materials.
- Accelerate research into processing technologies for light weight materials that enable propulsion energy savings in passenger and commercial vehicles.

Solar Energy Technology

Program Focus: Develop solar energy technologies – including photovoltaics, concentrating solar power, and solar heating and lighting systems – that are reliable, affordable, and environmentally sound.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Solar Energy (Energy Supply)			
Photovoltaic Energy Systems	72,537	76,277	74,973
Solar Heating and Lighting	2,863	2,846	2,980
Concentrating Solar Power	5,331	5,951	6,000
Total	80,731	85,074	83,953

Key Activities

- Improve conversion efficiency of crystalline silicon photovoltaic (PV) modules from 13% (2004) to 14% (2006).
- Continue R&D work on thin-film and next-generation PV materials with potential for dramatic cost reductions.
- Begin Collaborative Crystalline Silicon PV Initiative to strengthen through R&D the technological competitiveness of U.S. products in a rapidly growing world market.
- Expand concentrating solar power work on next-generation parabolic trough concentrators and receivers.

Wind & Hydropower Technologies

Program Focus: Low wind speed technology R&D for large and small wind turbines, and R&D for integrating wind into electric grid systems and distributed power applications.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Wind Energy (Energy Supply)			
Technology Viability	28,150	26,601	32,600
Technology Application	10,227	9,644	11,649
Congressionally Directed Activities:	1,426	4,559	
Hydropower Technologies (Energy Supply)			
Technology Viability	3,293	3,373	-
Technology Application	1,380	1,489	
Total	44,476	45,666	150 44,749 350

Key Activities

- Complete field testing of first full-scale Low Wind Speed Technology prototype turbine, and begin fabrication of second partner's prototype turbine (both 2.5 MW scale).
- Complete 1.8 kW turbine development, and launch second phase partnerships under Distributed Wind Technology project.
- Provide technical and outreach assistance that results in at least 19 states with over 100 MW wind installed.
- Share results of cost-shared testing of fish-friendly large turbines with industry.
- Close-out hydropower activities.

Biomass

Program Focus: Expand the use of biomass for energy and industrial products through advanced bioconversion techniques for the production of fuels, chemicals, and materials in integrated biorefineries.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Biomass and Biorefinery Systems R&D (Energy Conservation)			
Utilization of Platform Outputs	6,570	6,859	21,205
Technical Program Management Support	396	394	600
Biomass and Biorefinery Systems R&D (Energy Supply)			
Feedstock Infrastructure		1,984	1,000
Platforms Research and Development	982 28,874	30,073	43,360
Utilization of Platform Outputs	13,518	13,455	5,999
Congressionally Directed Activities	41,234	35,334	
Total	91,574	88,099	72,164

Key Activities

- Continue successful multi-agency collaboration toward the integrated industrial biorefinery
- Further lower the cost of sugars through integration of advanced enzymes with optimized pretreatment processes.
- Continue development of advanced technologies for improved economics and performance to biobased products.
- Further utilize and integrate technological advances in the production of sugars and products to improve the effectiveness and efficiency of the industrial biorefinery

Weatherization and Intergovernmental

Program Focus: Facilitate the movement of energy efficient and renewable energy products into the marketplace for a wide range of consumers, including State and local governments, weatherization agencies, communities, companies, fleet managers, building code officials, technology developers, Native American Tribal governments, and international agencies.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Weatherization (Energy Conservation)			
Weatherization Assistance Grants	227,166	228,160	230,000
State Energy Program Grants	43,952	44,176	41,000
State Energy Activities	2,324	2,320	500
Gateway Deployment	34,490	34,349	26,657
Intergovernmental (Energy Supply)			
International Renewable Energy Program	5,841	6,359	2,910
Tribal Energy Activities	4,906	5,457	4,000
Renewable Energy Production Incentive (REPI)	3,926	4,960	5,000
Total	**322,605**	**325,781**	**310,067**

Key Activities

- Weatherize 92,300 homes at an energy savings of 2.7 million Btu annually.
- Provide States $41 million in grants to develop emergency energy plans, foster clean, reliable, and diverse energy supplies, and reduce demand through energy efficiency.
- Achieve market penetration of 29% for ENERGY STAR® appliances and over 2% for CFLs.
- Support the installation, with cost-share, of 55-65 alternative fuel stations, including E-85, automotive LPG, and compressed natural gas.
- Help building owners upgrade 50 million square feet of floor space.
- Provide technical support and funding for Tribal energy projects.

Geothermal Technologies

Program Focus: Increase the U.S. geothermal resource base and reduce the cost of heat and power through advanced technologies.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Geothermal Technology (Energy Supply)			
Technology Development	16,425	15,480	19,799
Technology Application	6,238	6,232	3,500
Congressionally Directed Activities	1,962	3,558	-
Total	24,625	25,270	23,299

Key Activities

- Completion of long-term testing of enhanced reservoir at California geothermal field.
- Conduct State resource assessment in collaboration with the USGS and three western states.
- Initiate a geothermal project on Tribal land.
- Construction of advanced technology geothermal power plant in western USA.

Buildings Technologies

Program Focus: Develop technologies, tools, and standards for making residential and commercial buildings and appliances more energy efficient.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Buildings Technologies (Energy Conservation)			
Residential Buildings Integration	12,937	16,800	18,311
Commercial Buildings Integration	4,440	5,125	4,541
Emerging Technologies	28,286	31,420	25,358
Equipment Standards and Analysis	10,265	10,147	8,256
Oil Heat Research for Residential Buildings	494	493	-
Technical/Program Management Support	1,377	1,479	1,500
Total	57,799	65,464	57,966

Key Activities

- "Leap-frog" current lighting technology by advancing organic and inorganic light emitting diodes (LEDs) with a focus on applied research that enables the industrial base to manufacture LEDs.
- Integrate renewable energy systems into highly efficient building designs and operations, the focus of which is design packages that enable residential buildings that use 40-50% less energy than current practice.
- Improve the energy efficiency of building components and equipment, and their effective integration using whole-building-system-design techniques.
- Continues commitment to equipment standards and test procedures.

Distributed Energy

Program Focus: Strengthen America's energy infrastructure and provide utilities and consumers with a greater array of energy efficient technology choices for the on-site generation of electricity and use of thermal energy.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Distributed Energy (Energy Conservation)			
Distributed Generation Technology Development	39,497	39,322	35,485
End-Use System Integration and Interface	19,676	20,571	20,500
Technical/Program Management Support	511	523	644
Total	59,684	60,416	56,629

Key Activities

- Demonstrate a prototype 35 percent efficient microturbine system.
- Develop one packaged CHP system which operates at 70+% efficiency.
- Complete regulatory database on state regulation, building and environmental standards such as permitting standards, and interconnection standards, which will be viewable on a central website.

Federal Energy Management

Program Focus: Reduce energy costs and environmental impacts of government by promoting energy efficiency, water conservation, energy security, and provide contract support for utility management decisions at Federal sites.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Federal Energy Management Program (Energy Conservation)			
Project Financing	7,830	7,133	6,827
Technical Guidance and Assistance	8,140	8,160	7,720
Planning, Reporting and Evaluation	2,571	2,638	2,600
Technical/Program Management Support	879	-	-
Departmental Energy Management Program (Energy Supply)			
Energy Management Project Support	1,472	1,455	1,506
Energy Management Model Program Development	491	496	513
Total	21,383	19,882	19,166

Key Activities

- Will achieve between $80 and $120 million in private sector investment through Super ESPCs and/or UESCs which we expect to result in about 720 billion Btus in energy saved.
- Will provide technical and design assistance for 27 Federal projects which we expect to result in about 60 billion Btus in energy saved.
- Will train 4,000 Federal energy attendees in energy management best practices.
- Will complete the competitive selection process for funding of 4 to 13 energy efficiency retrofit projects at DOE facilities which we expect to result in about 12 billion Btus in energy saved.

Industrial Technologies

Program Focus: Reduce the energy intensity of the U.S. industrial sector through a coordinated program of research and development, validation, and dissemination of energy efficiency technologies and operating practices.

Budget

Funding (dollars in thousands)			
Subprogram	FY04 Comparable Approp.	FY05 Comparable Approp.	FY06 Request
Industrial Technologies (Energy Conservation)			
Industries of the Future (Specific)	45,659	38,176	22,087
Industries of the Future (Crosscutting)	38,874	32,885	30,609
Technical/Program Management Support	5,917	3,740	3,793
Total	90,450	74,801	56,489

Key Activities

- Target investments on pre-competitive and high-risk research, development, and demonstration projects that reduce industrial energy intensity.
- Continue replication of energy-saving technologies through Best Practices and other technical assistance.