



Department of Defense Facilities Energy Conservation Policies and Spending

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Summary

In the early 1970s, Congress began mandating reductions in energy consumed by federal agencies; primarily by improving building efficiency, and reducing fossil fuel use. Early legislation mandated a 10% reduction in federal building energy and a recent Executive Order mandates a 30% further reduction by 2015. President-elect Obama has included the goal of improving public building energy efficiency in his administration's economic recovery plan.

This report reviews energy conservation legislation and Executive Orders that apply to the Department of Defense, directives and instructions to the military departments and agencies on implementing the legislation and orders, Defense spending on facility energy over the last decade, annual Defense appropriations that fund energy-conservation improvements, and Defense energy conservation investments.

In FY2007, Defense spending on energy to operate its facilities reached almost \$3.5 billion. In the last decade, Congress has appropriated \$443 million in Defense energy conservation projects, and the value of contracts to install energy savings improvements has exceeded \$2.8 billion. While the Defense Department has reduced its energy consumption, its energy spending increased due to higher energy prices. Congress continues to look at furthering energy efficiency improvements in aging Defense facilities and buildings as a means to rein in energy consumption and spending.

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Background

The Department of Defense (DOD) accounts for approximately 63% of the energy consumed by federal facilities and buildings.¹ This makes DOD the single largest energy consumer in the United States, even though consuming only 1% of national site-delivered energy.² Its annual spending on facility energy has averaged over \$3.4 billion recently.

In the early 1970s, Congress began mandating reductions in energy consumed by federal agencies, primarily by improving the efficiency of buildings and facilities, and by reducing fossil fuel use. Initially, a 10% energy reduction goal was established for federal buildings as measured against a 1985 baseline.³ By fiscal year (FY) 2005, DOD reported a 28.3% reduction in energy consumption compared to the baseline. Recent legislation and Executive Orders establish further energy reduction goals. President-elect Obama's recently publicized economic recovery plans include improvements in public building energy efficiency. Recently introduced bills in Congress have called for establishing national building efficiency codes.

This report reviews the energy conservation provisions in past and recent legislation applicable to DOD, Executive Orders that apply to all federal facilities⁴ and operations, and the Office of the Secretary of Defense (OSD) directives and instructions to the military departments and agencies. DOD spending on facility energy is annually reported to Congress as originally mandated by the National Energy Conservation Policy Act (NECPA). Data reported over the last decade have been summarized in this report. Annual defense appropriations that fund energy conservation measures along with DOD energy conservation investments are also summarized. This report does not cover the subject of transportation fuels.

Energy Efficiency Legislation

Federal government initiatives aimed at reducing energy consumption can be traced back to the start of the Federal Energy Management Program (FEMP) in 1973. The 1978 National Energy Conservation Policy Act (NECPA), Public Law (P.L.) 95-619, began the program of retrofitting federal buildings to improve energy efficiency. The 1985 Deficit Reduction Act (P.L. 99-272) amended NECPA by authorizing energy savings contracts of up to 25 years.

The 1992 Energy Policy Act further amended NECPA by adopting Energy Savings Performance Contracts (ESPCs) that offered federal agencies a novel means of making energy efficiency improvements to aging buildings and facilities (see discussion below). NECPA required federal agencies, including DOD, to report annually on the energy consumption by their buildings,

¹ Assistant Secretary, Energy Efficiency and Renewable Energy, *Annual Report to Congress on Federal Government Energy Management Programs*, U.S. Department of Energy, September 26, 2006, pp. Table A-3, http://www1.eere.energy.gov/femp/about/annual_report.html.

² When measured in terms of energy delivered to the point of use or site-delivered energy consumption, the Government consumed 1.1 quads during FY2005 of the total 99.84 quads used in the United States.

³ Measured on a Btu-per-gross-square-foot (Btu/gsf) basis.

⁴ For the purposes of the Energy Independence and Security Act of 2007, the term 'facility' means any building, installation, structure, or other property (including any applicable fixtures) owned or operated by, or constructed or manufactured and leased to, the Federal Government.

operations, and vehicles.⁵ Overall federal energy consumption is reported annually to Congress by the Department of Energy (DOE) Federal Energy Management Program (FEMP).⁶ The Federal Energy Management Improvement Act of 1988 (P.L. 100-615) amended NECPA by requiring each agency to achieve a 10% reduction in energy consumption in federal buildings by FY1995 when measured against an FY1985 baseline in terms of British thermal units per gross square foot (Btu/gsf) of building area.⁷

More recently, two major energy bills have been enacted with provisions generally pertaining to all federal agency facilities—the Energy Policy Act of 2005 (EPACT – P.L. 109-58)⁸ and the Energy Independence and Security Act of 2007 (EISA – P.L. 110-140).⁹ Annual DOD appropriation bills have also included energy provisions specifically pertaining to defense facilities. Legislation pertaining to the energy efficiency of federal and DOD buildings is summarized below. For bills introduced since the 107th Congress, refer to the **Appendix** of this report.

Energy Policy Act of 2005 (P.L. 109-58)

- Section 103. *Energy Use Measurement and Accountability* amended Section 543 of the NECPA with the mandate for using advanced meters to reduce electricity use in federal buildings by October 1, 2012.¹⁰
- Section 109. *Federal Building Performance Standards* amended the Energy Conservation and Production Act¹¹ by adopting the 2004 International Energy Conservation Code, and requiring revised energy efficiency standards and a 30% reduction in energy consumption of new federal buildings over the previous standards.
- Section 203. *Federal Purchase Requirement* requires that the federal government offset its electric energy consumption with an increasing percentage of “renewable energy” from 3% starting in 2005 to not less than 7.5% by 2013 and each fiscal year thereafter.¹² Renewable energy is defined as electrical energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.

⁵ 42 U.S.C.A. § 8251 Sec. 303 – Annual Reports to the President.

⁶ See U.S. Department of Energy, Efficiency and Renewable Energy, *Annual Report to Congress*, http://www1.eere.energy.gov/femp/about/annual_report.html.

⁷ 42 U.S.C. § 8253 (a) (1).

⁸ See CRS Report RL33302, *Energy Policy Act of 2005: Summary and Analysis of Enacted Provisions*, by Mark Holt et al.

⁹ See CRS Report RL34294, *Energy Independence and Security Act of 2007: A Summary of Major Provisions*, by Fred Sissine.

¹⁰ See Department of Energy, *Guidelines for Electric Metering in Federal Buildings*, DOE/EE-0312, February 3, 2006.

¹¹ 42 U.S.C. § 6834.

¹² 42 U.S.C. § 15852(a).

Energy Independence and Security Act of 2007 (P.L. 110-140)

- Section 431. *Energy Reduction Goals for Federal Buildings* amends the National Energy Conservation Policy Act (NECPA)¹³ by mandating a 30% energy reduction in federal buildings by 2015 relative to a 2005 baseline.
- Section 432. *Management of Energy and Water Efficiency in Federal Buildings* requires DOE to issue guidelines and criteria that each federal agency will follow for designating “covered facilities”, assigning energy managers, and implementing comprehensive energy and water evaluations. For the purpose of energy and water evaluations, covered facilities constitute at least 75% of facility energy use at each facility.
- Section 433. *Federal Building Energy Efficiency Performance Standards* requires 55% reduced fossil energy use in new federal buildings and major renovations by 2010 relative to a 2003 baseline, and 100% by 2030.
- Section 434. *Management of Federal Building Efficiency* requires that federal agencies ensure the energy life-cycle cost effectiveness of major equipment replacements (such as heating and cooling systems) and renovations or expansion of existing space.
- Section 435. *Leasing* prohibits federal agencies from leasing buildings that have not earned an EPA Energy Star label.¹⁴
- Section 436. *High Performance Green Federal Buildings* directs the establishment of federal high-performance green building standards for all types of federal facilities,¹⁵ and the establishment of green practices that can be used throughout the life of a federal facility.
- Section 512. *Financing Flexibility* authorizes federal agencies to use a combination of appropriated funds and private financing for Energy Savings Performance Contracts (ESPC).
- Section 514. *Permanent Authorization* enacts permanent authorization of ESPCs, and restricts federal agencies from limiting the duration of ESPCs to less than 25 years or limiting the total amount of obligations.
- Sec. 518. *Study of Energy and Cost Savings in Nonbuilding Applications* directs DOD to study the potential use of ESPCs in nonbuilding applications, which include vehicles and federally owned equipment that generate electricity or transport water.

¹³ 42 U.S.C. § 8253(a) (1).

¹⁴ In 1992 the US Environmental Protection Agency (EPA) introduced ENERGY STAR as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Computers and monitors were the first labeled products. Through 1995, EPA expanded the label to additional office equipment products and residential heating and cooling equipment. In 1996, EPA partnered with the US Department of Energy for particular product categories. The ENERGY STAR label is now on major appliances, office equipment, lighting, home electronics, and more. EPA has also extended the label to cover new homes and commercial and industrial buildings. http://www.energystar.gov/index.cfm?c=about.ab_history.

¹⁵ Consistent with the requirements of Section 305(a)(3)(D) of the Energy Conservation and Production Act (42 U.S.C. 6834(a)(3)(D)).

- Section 526. *Procurement and Acquisition of Alternative Fuels* prohibits federal agencies from procuring alternative or synthetic fuels, unless contract provisions stipulate that life-cycle greenhouse gas emissions do not exceed equivalent conventional fuel emissions produced from conventional petroleum sources.¹⁶

National Defense Authorization Act for FY2007 (P.L. 109-364)

Subtitle E (Energy Security), reorganizes 10 U.S.C 2865 to establish new energy performance goals for DOD, establish new goals for using renewable energy, and encourage energy efficiency products and renewable forms of energy in new construction. More specifically:

- Section 2851. *Consolidation and Enhancement of Laws to Improve Department of Defense Energy Efficiency and Conservation* reorganizes 10 U.S.C. 2865 by the insertion of (new) Chapter 173—*Energy Security*, which requires the establishment of energy performance goals for transportation systems, support systems, utilities and infrastructure; leaves any appropriated funds equal to energy cost savings available for obligation until expended; requires development of a simplified method for contracting energy savings contract services; and authorizes energy conservation construction projects not previously authorized using appropriated funds after notification to Congress.
- Section 2852. *Department of Defense Goal Regarding Use of Renewable Energy to Meet Electricity Needs* amends 10 U.S.C. 2911 by making it DOD's goal to produce or procure at least 25% of its electric energy consumption from renewable sources by the year 2025.
- Section 2853. *Congressional Notification of Cancellation Ceiling for Department of Defense Energy Savings Performance Contracts* requires Congressional notice when federal agencies award an energy savings performance contract that contains a clause setting forth a cancellation ceiling in excess of \$7,000,000.¹⁷
- Section 2854. *Use of Energy Efficiency Products in New Construction* requires that to the maximum extent practicable, energy efficient products meeting Defense Department requirements must be used in new facility construction.

National Defense Authorization Act for FY2008 (P.L. 110-181)

- Section 828. *Multiyear Contract Authority For Electricity From Renewable Energy Sources* authorizes contracts periods of up to 10 years for purchasing electricity from sources of renewable energy.
- Sec. 2861. *Repeal of Congressional Notification Requirement Regarding Cancellation Ceiling for Department of Defense Energy Savings Performance Contracts* amends 10 U.S.C § 2913 by striking subsection (e) requiring

¹⁶ The provision was included to ensure that federal agencies are not spending taxpayer dollars on new fuel sources that will exacerbate global warming—a response to proposals under consideration by the Air Force to develop coal-to-liquid fuels. Letter of March 17, 2008, from Chairman, House Committee on Oversight and Government Reform to Chairman, Senate Committee on Energy and Natural Resources.

¹⁷ Federal Acquisition regulations—Part 17 Special Contracting Methods—define “cancellation ceiling” to mean the maximum cancellation charge that the contractor can receive in the event of cancellation.

notification of an ESPC awarded with a cancellation ceiling clause exceeding \$7 million.

National Defense Authorization Act for FY2009 (P.L. 110-417)

- Section 902. *Director of Operational Energy Plans and Programs* amends 10 U.S.C. 139 by directing the appointment of a director responsible for the oversight of energy required for training, moving, and sustaining military forces and weapons platforms for military operations.
- Section 2831. *Certification of Enhanced Use Leases for Energy-related Projects* amends 10 U.S.C. 26679(h) by requiring certification that a lease exceeding 20 years for an energy production project is consistent with DOD performance goals.
- Section 2832. *Annual Report on Department of Defense Installations Energy Management* amends 10 U.S.C. 29259(a) by revising the subsection heading to “Annual Report Related to Installations Energy Management” and adding the reporting requirement for a description and estimate of the progress made by the military departments in meeting the certification requirements for sustainable green-building standards in construction and major renovations as required by Section 433 of EISA 2007.

Executive Order 13423

In signing Executive Order (EO) 13423 - *Strengthening Federal Environmental, Energy and Transportation Management*, President Bush revoked five earlier executive orders affecting federal agencies’ energy and environmental management.¹⁸ Section 11 of the order consolidates and strengthens the five Executive Orders and two Memorandums of Understanding (MOU) and establishes new and updated goals, practices, and reporting requirements for environmental, energy, and transportation performance and accountability.¹⁹ In some cases the new executive order puts in place replacement energy and environmental efficiency goals for previous goals with target dates that have passed.

The new Executive Order also implements and supplements provisions of the EPACT dealing with energy and environmental management by federal agencies. The combination of EPACT (Title I, Part A) and EO13423 define the current energy efficiency objectives for federal agencies. EO13423 directs all federal agencies, including DOD, to improve energy efficiency and reduce greenhouse gas emissions through reduction of energy intensity (3% annually through the end of

¹⁸ The President, “Strengthening Federal Environmental, Energy, and Transportation Management,” 72 *Federal Register* 3919-3923, January 26, 2007.

¹⁹ Specifically, Section 11 of EO13423 revokes the following prior executive orders: EO13101 Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (September 14, 1998), EO13123 Greening the Government Through Efficient Energy Management (June 3, 1999), EO13134 Developing and Promoting Biobased Products and Bioenergy (August 12, 1999), EO13148 Greening the Government Through Leadership in Environmental Management (April 21, 2000), and EO13149 Greening the Government Through Federal Fleet and Transportation Efficiency (April 21, 2000). See “Fact Sheet, Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management,” Office of the Federal Environmental Executive at http://ofee.gov/eo/EO_13423FactSheet.pdf accessed (Accessed November 17, 2008).

FY2015, and 30% by the end of FY2015, relative to each agency's baseline energy use in FY2003). Progress in reaching building energy efficiency goals are scored by agencies in terms of reductions in energy consumption versus gross building area (Btu/gsf). For the energy reduction goals of EPACT and EO13423, some inherently inefficient industrial types of buildings are excluded from this scoring.

EO13423 (Section 2f) mandates specific energy reduction targets for new construction and renovations. Executive branch agencies are directed to meet objectives set in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding ("Sustainable Buildings MOU").²⁰ The Sustainable Buildings MOU calls for new buildings to be 30% more cost efficient than industry standards, and for buildings undergoing major renovations to be 20% more cost efficient than a pre-renovation, 2003 baseline. Federal agencies are encouraged to incorporate sustainable practices into projects underway, and are also encouraged to sell or dispose of unneeded assets.²¹

Executive Order 13123, now revoked, had directed improvements in building energy efficiency, promoted the use of renewable energy, and set goals for reduction of greenhouse gas (GHG) emissions associated with energy use in buildings, among other energy-related requirements. The revoked order had also served as the basis of DOD's instruction to the services on energy use. In contrast, the new Executive Order 13423 has no specific GHG reduction target. However, Section 2.a of the new Executive Order does include the goal of cutting GHG emissions by federal agencies through reductions in the energy intensity of agency operations, but does not specify a GHG reduction target.

EPACT only credited electricity from renewable energy sources in meeting federal purchase requirements. EO13423 now requires that at least half of the EPACT renewable energy requirement comes from new (put in service after January 1, 1999) renewable energy sources. Agencies may also use new non-electric renewable energy sources to meet the requirement for new renewable energy. (Examples of non-electric renewable energy include thermal energy from solar ventilation pre-heat systems, solar heating and cooling systems, solar water heating, ground source heat pumps, biomass heating and cooling, thermal uses of geothermal and ocean resources.) However, these non-electric renewable energy sources cannot be used to meet the EPACT renewable electricity requirement (see **Table 1**).²²

²⁰ The Sustainable Building MOU is available at http://www.fedcenter.gov/_kd/Items/actions.cfm?action=Show&item_id=4713&destination=ShowItem (accessed on November 17, 2008).

²¹ Office of Management and Budget, *Instructions for Implementing Executive Order 13423*, March 29, 2007, p. 25, <http://www.whitehouse.gov/omb/memoranda/2007.html>.

²² U.S. Department of Energy, Energy Efficiency and Renewable Energy, *Renewable Energy Requirement Guidance for EPACT and Executive Order 13423*, January 28, 2008, p. 5, http://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf.

Table 1. Meeting EPACT 2005 Renewable Energy Goals Through EO 13423

Renewable energy sources credited in meeting federal purchase requirements

	Source	Energy	2007-2009	2009-2012	2013-out
EPACT '05		Electric	3%	5%	7.5%
EO 13423	Old	Electric	1.5%	2.5%	3.75%
Minimum Goal	New	Electric	1.5%	2.5%	3.75%
Total			3%	5%	7.5%
EO 13423	Old	Electric	3%	5%	7.5%
Full Goal	New	Non-Electric	1.5%	2.5%	3.75%
Total			4.5%	7.5%	11.25%

Source: U.S. DOE/FEMP *Renewable Energy Requirement Guidance for EPACT and Executive Order 13423*.

Notes: Old renewable energy sources are those put into service prior to January 1, 1999. Between minimum and full goal, federal agencies can use any combination of new non-renewable electric and electric renewable energy sources to meet EO 13423 requirements. For purposes of EPACT and EO 13423, purchases of Renewable Energy Certificates (RECs) are treated the same as renewable energy purchases; however RECs from qualified renewable sources of non-electric energy can only be used to the EO 12423 requirement..

For the purpose of meeting the energy intensity reduction goals under EPACT (Btu/gsf), the credit agencies receive for renewable energy purchases started to phase out in FY2008, and will be reduced to zero by FY2011.

Finally, EO13423 requires each federal agency to annually report to the President. The Office of Management and Budget (OMB) provides general reporting guidance in Circular No. A-11 (Section 55 – *Information on Energy Use, Costs, and Efficiency*). Detailed reporting guidance is provided in a recent DOE memorandum to federal agency energy coordinators.²³

Defense Energy Policies

The Office of the Secretary of Defense (OSD) has issued directives and instructions to the military departments and agencies on implementing EO13423 and complying with energy legislation. In an October 23, 2007 *Energy Awareness Campaign* memorandum to the service departments and agencies, the Under Secretary of Defense underscored the energy conservation goals of EO13423 and established October as an Energy Awareness month. The memorandum effectively superseded an earlier January 2005 memorandum that referenced EO13123 - *Greening the Government through Efficient Energy Management*.

DOD's primary guidance on installation energy management appears in DOD Instruction 4170.11.²⁴ The instruction applies to all military departments and agencies, and pertains to all

²³ Letter from Richard Kidd, Program Manager, Federal Energy Management Program, Office of Energy Efficiency and Renewable Energy, to Federal Agency Energy Coordinators, Reporting Guidance for FY2008 Annual Report on Federal Government Energy Management, September 8, 2008, http://www1.eere.energy.gov/femp/about/reporting_guidance.html.

²⁴ Office of the Deputy Under Secretary of Defense / Installations and Environment, *Department of Defense Installations Energy Management Program*, November 22, 2005, http://www.acq.osd.mil/ie/irm/Energy/Energy_Home/energyAbout.shtml.

phases of administration, planning, programming, budgeting, operations, maintenance, training, and materiel acquisition activities that affect the supply, reliability and consumption of facilities energy. In reference to Instruction 4170.11, a November 18, 2005 memorandum on Installation Energy Policy Goals establishes goals of reducing greenhouse gases, reducing energy and water consumption, expanding renewable energy procurement, and reducing petroleum use. It also directs the completion of eligible utility privatization in a process established under the Deputy Secretary of Defense. Further guidance to DOD's installation and facility managers is provided in the DOD Energy Managers Handbook.²⁵ In particular, the guidance endorses the *sustainable building design* approach for building and facility life-cycles, and encourages DOD components to obtain the U.S. Green Building Council's *Leadership in Energy and Environment Design* (LEED) certification.²⁶ DOD responded to the EPACT Section 103 electric metering provision by revising instructions on installation energy management to require metering at all appropriate facilities in *Department of Defense Metering Plan*.

Defense Energy Consumption and Spending

DOD reports occupying over 316,000 buildings and additional 182,000 structures on 536 military installations worldwide.²⁷ In FY2007 DOD spent over \$3.4 billion on energy consumed by its facilities as shown in **Table 2**; roughly 13% of Defense-wide operations and maintenance (O&M) budget obligation authority. (In FY2001, it ran as high as 23%.) Electricity represented 45% of energy consumed, followed by natural gas at 33%, fuel oil at 11%. The balance was made up of coal and liquefied petroleum gas (LPG). Renewable energy represented 8.7% of facility electricity use. As shown in the **Table 3**, energy consumption (express in British Thermal Units – Btu) has been decreasing over the same period, as has gross building area.

Table 2. DOD Facility Energy Spending vs. O&M Budget
(\$ million)

	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
FE	2,253.9	2,403.6	2,792.2	2,614.1	2,564.9	2,812.2	2,971.4	3,496.9	3,436.7
O&M	11,380.2	11,661.4	12,202.3	13,540.1	14,816.7	16,570.8	21,219.6	21,025.1	26,000.6

Source: Office of the Deputy Under Secretary of Defense for Installations and Environment, Energy Management Report, <http://www.acq.osd.mil/ie/energy/index.shtml>. Office of the Under Secretary of Defense (Comptroller), Military Personnel (M-I) and Operation and Maintenance (O-I) programs, <http://www.defenselink.mil/comptroller/>.

Notes: FE represents Defense Facility energy spending. O&M represents Defense-Wide total budget obligation authority for operations and maintenance.

²⁵ Office of the Under Secretary of Defense, *Department of Defense Energy Manager's Handbook*, August 25, 2005, <http://www.acq.osd.mil/ie/irm/Energy/EnergyManagerSupport/energyManagerSupport.shtml>.

²⁶ See U.S. Green Building Council, <http://www.usgbc.org/>; CRS Report R40147, *Issues in Green Building and the Federal Response: An Introduction*, by Eric A. Fischer.

²⁷ Office of the Deputy Under Secretary of Defense for Installations and Environment, *Base Structure Report Fiscal Year 2008 Baseline*, <http://www.acq.osd.mil/ie/download/bsr/BSR2008Baseline.pdf>.

Table 3. DOD Facility Energy Consumption

Building Area (million square feet) vs. Consumption (billion Btu)

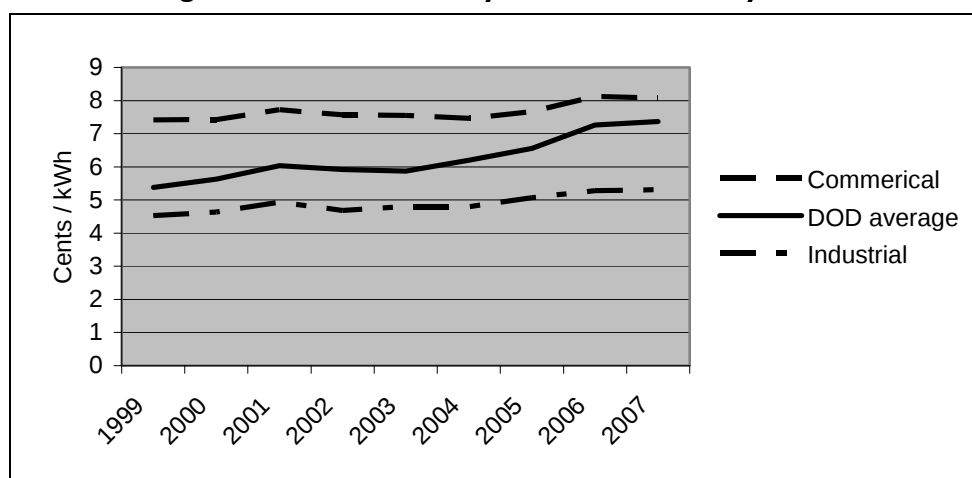
	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Bld. Area	2,199.8	2,200.4	2,182.4	2,183.7	2,174.0	2,093.3	2,112.1	1,957.1	1,954.2
Consumption	250,877	253,736	251,317	244,019	242,240	237,660	234,615	223,354	218,062

Source: Office of the Deputy Under Secretary of Defense (Installations and Environment), Energy Management Report, <http://www.acq.osd.mil/ie/energy/index.shtml>.

Notes: Consumption takes into account standard, industrial, and exempt buildings; and includes electricity, fuel oil, natural gas, LPG/propane, coal, purchased steam, and other energy types. Electric energy consumption is reported in megawatt-hours by DOD and converted to Btu for purposes of measuring overall building energy consumption in terms of in Btu-per-gross-square-foot.

Over the current decade, both electricity rates and natural gas prices steadily increased. DOD's average electricity costs in cents per kilowatt-hr (kWh) have stayed between the range of rates charged to commercial and industrial customers, as shown in **Figure 1**.

Figure 1. DOD Electricity Cost vs. Electricity Rates



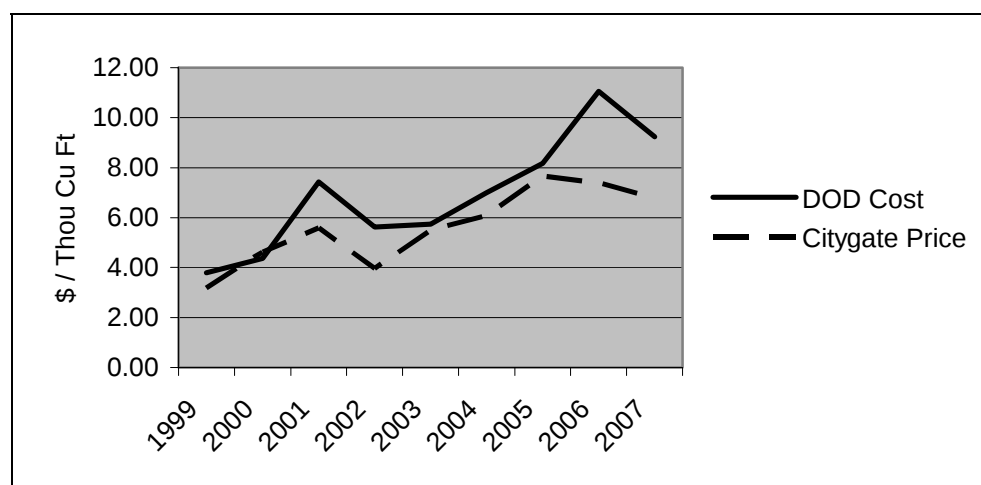
Source: U.S DOE/EIA Table 8.10 Average Retail Prices of Electricity, 1960-2007 <http://www.eia.doe.gov/emeu/aer/txt/ptb0810.html>; and Office of the Deputy Under Secretary of Defense (Installations and Environment), Energy Management Report, <http://www.acq.osd.mil/ie/energy/index.shtml>.

Notes: Previous to EPACT, energy consumption was reported under three categories: standard, industrial, and exempt building types. Reporting under EPACT combined standard and industrial facility types. Exempt facilities are structures that are particularly energy intensive.

DOD natural gas costs have generally tracked the price of gas at the local distribution company (LDC) citygate (**Figure 2**). The citygate is the point at which the LDC takes gas from the transmission pipeline for distribution to its customers. The spike in DOD's cost relative to the falling citygate price is not explained in any DOD reporting.

Figure 2. DOD Natural Gas Costs vs. Citygate Price

\$ Per Thousand Cubic Feet



Source: U.S DOE/EIA Table 6.7 Natural Gas Wellhead, City Gate, and Imports Prices, 1949-2007 <http://www.eia.doe.gov/emeu/aer/txt/ptb0607.html>; and Office of the Deputy Under Secretary of Defense (Installations and Environment), Energy Management Report, <http://www.acq.osd.mil/ie/energy/index.shtml>.

Notes: Citygate price represents the local distribution company's cost. Typically, LDCs take ownership of the natural gas at the citygate, and deliver it to each individual customer's location of use.

Renewable Electric Energy Purchases

Reporting requirements for renewable energy have changed over the last decade due to new legislated mandates and Executive Orders. EPACT Section 203 requires federal agencies to replace electricity consumption with increasing amounts of renewable energy. Federal agencies must also meet the new renewable energy requirements of EO13423. In 1999, DOD had not yet begun reporting on renewable energy. A limited capacity of photovoltaic (solar) panels had been installed, but operating statistics under the category of self-generated power had not been compiled until FY2001. As shown in **Table 4**, DOD began reporting renewable energy in FY2000. For FY2007, DOD reported using over 1.6 million MWH of renewable electricity, which represented 5.5% of overall electricity consumption. The renewable energy goal by 2025 is 25% of total electricity use.

Table 4. Renewable Electricity Use vs. Total Electricity Use

(Megawatt-hours)

	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Renewable	164,076	252,972	321,592	431,000	504,223	1,425,151	1,238,282	1,639,924
Total Elec.	30,242,318	29,963,594	30,352,859	29,747,453	30,666,157	29,594,692	29,792,539	29,656,103
%	0.5	0.8	1.0	1.4	1.6	4.8	4.1	5.5

Source: Office of the Deputy Under Secretary of Defense (Installations and Environment), Energy Management Report, <http://www.acq.osd.mil/ie/energy/index.shtml>.

Notes: Renewable includes purchased renewable electricity credits and self-generated electricity. Total electricity includes standard, industrial, and exempt buildings.

Defense Energy Efficiency Improvements

Despite reductions in energy consumption, annual energy spending increased up through FY2006 and would likely have been higher without investment in energy efficiency improvements. DOD programs improvements through the Defense Energy Conservation Investment Program (ECIP), and takes advantage of ESPCs, and Utility Energy Savings Contracts (UESCs). Improvements are funded directly through the Defense Military Construction (MILCON) program, and indirectly through Operation and Maintenance (O&M) appropriations.

Energy Conservation Investment Program

Between 1999 and 2009, Congress appropriated \$442.9 million in Defense Energy Conservation Projects (summarized in **Table 5**). These projects are accomplished through the DOD Energy Conservation Investment Program (ECIP), which designates projects that specifically save or reduce Defense energy costs, and are funded under MILCON.

Table 5. National Defense Authorizations for Energy Conservation Projects

FY2000- FY2009 (\$ million)

FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
P.L. 106-65	P.L. 106-398	P.L. 107-107	P.L. 107-314	P.L. 108-136	P.L. 108-375	P.L. 109-163	P.L. 109-364	P.L. 110-181	P.L. 110-417
1.3	15.0	27.1	34.5	50.0	50.0	50.0	55.0	70.0	90.0

Note: The bill titles are provided in **Table A-2** of the Appendix to this report.

According to the Office of the Secretary of Defense: “OSD centrally controls ECIP funding allocation on a by-project basis. In FY 1999 ECIP funds were allocated to those projects with the highest savings to investment ratio (SIR) and the best payback periods, regardless of component. In FY 2001, the Department revised this process to allocate funds based on the components’ percentage of total DOD installations BTU consumption. Within the allocated amount, the Component prioritizes their projects based on a combination of SIR and the priorities emphasized by the Energy Policy Act of 2005, Executive Order (EO) 13423, and the Energy Independence and Security Act of 2007. The Department emphasizes the use of ECIP in reducing energy consumption and greenhouse gas emissions, and increasing the use of renewable energy.”²⁸

Between 2001 and 2007, DOD in turn allocated \$260.3 million for 193 ECIP projects (summarized in **Table 6**).

²⁸ OSD Installations and Environment, Energy Conservation Investment Program
{<http://www.acq.osd.mil/ie/irm/Energy/ecip/ecip.shtml>}

Table 6. DOD Energy Conservation Investment Program

Projects vs. Spending (\$ million)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Projects #	18	22	32	36	42	43	46
Spending \$	14.9	20.7	24.5	47.3	48.7	49.6	54.6

Source: Office of the Deputy Under Secretary of Defense (Installations & Energy), <http://www.acq.osd.mil/ie/energy/ecip/ecip.shtml>.

Notes: Allocations for 1999 and 2000 were not reported.

Energy Savings Performance Contracts

ESPCs complement DOD's Energy Conservation Investment Program and Defense Energy Conservation appropriations by providing additional energy efficiency improvements. Qualified Energy Service Companies (ESCOs) finance the improvements through the savings realized by the facility, typically over a life-cycle of 10 to 25 years.²⁹ These contracts include infrastructure improvements and new equipment to help reduce energy consumption. Examples include new thermal storage systems, chillers, boilers, lights, motors, energy monitoring and control systems, and water saving devices. In return for providing the financing, the ESPC contractor receives a specified share of any resulting energy cost savings.

Between 1999 and 2007, DOD awarded 248 ESPCs for a value exceeding \$2.8 billion (summarized in **Table 7**). ESPCs are funded through O&M appropriations. The Congressional Budget Office's (CBO) view of ESPCs found that they imposed a future financial obligation on the federal government. CBO began scoring ESPCs as mandatory spending, coinciding with the expiration of the 1990 Budget Enforcement Act (P.L. 101-508) pay-as-you-go (PAYGO) rules. The CBO scoring reflects how ESPCs create future commitments to appropriations, consistent with how appropriations-funded ECIPs would be scored throughout the budget.³⁰ The Government Accountability Office (GAO) finds that the benefits of ESPCs could be achieved using upfront funds (that is, fully funded in advance) and with lower financing costs, but agencies generally do not receive sufficient funds upfront for doing so and see ESPCs as a necessary supplement to upfront funding in order to achieve the energy savings benefits.³¹

²⁹ The Federal Energy Management Program (FEMP) established the U. S. Department of Energy Qualified List of Energy Service Companies (DOE Qualified List) in accordance with the Energy Policy Act of 1992 and 10 CFR 436. The DOE Qualified List (PDF 270 KB) comprises private industry firms that have submitted an application and been qualified by the Qualification Review Board. This board consists of representatives from the Federal Interagency Energy Management Task Force and DOE staff.

http://www1.eere.energy.gov/femp/financing/superespcs_qualifiedescos.html

³⁰ For further information, see CRS Report RL32543, *Energy Savings Performance Contracts: Reauthorization Issues*.

³¹ U.S. Government Accountability Office, *Energy Savings - Performance Contracts Offer Benefits, but Vigilance Is Needed to Protect Government Interests*, GAO-05-340, June 2005, <http://www.gao.gov/new.items/d05340.pdf>.

Table 7. DOD ESPCs

Contract Numbers (#) vs. Contract Value (\$ million)

	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
ESPC #	45	58	30	32	34	5	15	19	10
Value \$	10.9	414.6	318.4	596.6	549.9	16.2	141.0	586.5	170.4

Source: Office of the Deputy Under Secretary of Defense for Installations & Energy, Energy Management Report page, http://www.acq.osd.mil/ie/energy/energymgmt_report/main.shtml.

Notes: During FY2004, ESPC authority had temporarily lapsed. Federal Agencies are required to submit an Energy Management Report annually to DOE's Federal Energy Management Program under NECPA as amended by EPACT 1992. The format and content has changed several times since 2004 due to EPACT and Executive Order 13423. It will likely change again for FY2008 due to EISA 2007. DOD also provides the report directly to the congressional defense committees.

Utility Energy Savings Contracts

DOD Utility Energy Savings Contracts (UESC) are financed and implemented through utility companies, similar in some respects to ESPCs. Essentially, the same energy efficiency improvements can be accomplished through UESCs as ESPCs. With a UESC, the utility typically finances the capital costs of the project, and is repaid over the contract term from the cost savings generated by the energy efficiency measures.³² The installation or facility pays for the improvement through O&M appropriated funds. There are no statutory energy savings guarantees for UESCs, unlike ESPCs. Although a facility manager may request such a guarantee at the time of a project's installation. Between 1999 and 2006, DOD reported placing 241 UESCs worth \$967.6 million (summarized in **Table 8**).

Table 8. DOD UESCs

Contract Numbers (#) vs. Contract Value (\$ million)

	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
UESC #	0	41	44	41	31	20	22	17	25
Value \$	0.9	148.7	140.9	123.2	152.1	86.9	83.5	97.5	133.9

Source: Office of the Deputy Under Secretary of Defense for Installations & Energy, Energy Management Report page, http://www.acq.osd.mil/ie/energy/energymgmt_report/main.shtml.

Policy Considerations and Options for Congress

DOD spending on energy consumed by its facilities worldwide can make up as much as 23% of its annual Operating and Maintenance budget. More than \$3.4 billion was spent annually in FY2006 and FY2007. DOD has steadily decreased its buildings' energy-intensity in response to mandated energy reduction goals through investment in energy conservation projects. Over the last decade, Congress has appropriated \$443 million in DOD energy conservation projects, DOD investment in energy conservation adds another \$250 million, and the value of Energy Savings

³² U.S. Department of Energy Federal Energy Management Program, Financing Mechanisms, Utility Energy Savings Contracts

Performance Contracts (ESPCs) exceeds \$2.8 billion. Despite the investments, DOD annual energy spending has been increasing since 1999, as have electricity and particularly natural gas prices. Further investment in energy conservation is expected to meet the future mandated energy reduction goals.

ESPCs have become a preferred means of making energy efficiency improvements because, in part, funds do not have to be directly appropriated (or programmed). However, as Energy Savings Contractors (ESCOs) assume a certain risk in guaranteeing savings through ESPCs, the risk is factored into their cost. Also, ESPC commitments may extend up to 25 years—an indication of the time needed to recoup the ESCO's investment. As energy efficiency improvements made through UESCs do not necessarily come with savings guarantees and thus risk, the lower cost may translate into higher savings. Federal agencies may not be taking full advantage of this savings opportunity. This may be due to individual utilities limited role promoting UESCs, the number of utilities that may offer UESCs, installation managers' unfamiliarity with UESCs, and ESCOs influence in promoting ESPCs.

Aging buildings may have limits in meeting energy efficiency goals, and investment in energy conservation may eventually see diminishing returns in energy savings. Overall goals may be achieved, ultimately, through the replacement of older building with new buildings built to LEED standards and even newer "high-performance" building standards being developed the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).³³ Whether future investments in energy conservation projects and ESPC commitments should give way to replacing older inefficient building with new construction is an issue that Congress may eventually wish to consider. Authorizing ESPCs for building renovation could be used to install more efficient equipment, better insulation and windows, and possibly renewable energy sources whose installation might not be accomplished by appropriation alone. Congress may wish to consider expanding the EISA Section 518 EPSC provision (non-building applications), to study renovating energy-inefficient buildings to LEED and high-performance standards.

Under EISA 2007, Congress has authorized mixing appropriated funds with private financing of ESPCs. How funds appropriated for O&M may be applied to ESPCs, though, is unclear. DOE has not yet promulgated rules on the new authority. The lack of rules may prove to be a critical barrier to accomplishing DOD-related provisions in the American Recovery and Reinvestment Act (ARRA) of 2009 (P.L. 111-5). ARRA provides nearly \$3.7 billion under O&M for Defense Facilities Sustainment, Restoration, and Modernization that may be applied toward energy efficiency projects and repair and modernization of DOD facilities.³⁴ Another \$300 million for Research Development, Test and Evaluation may be applied to improvements in energy generation on military installations. The combined funding nearly matches the \$4.2 billion in ECIP, ESPC, and UESC spending from FY1999 through FY2007. The ARRA appropriation, however, remains available for obligation until September 30, 2010. Acquisition planning for the improvements, not including the year-long acquisition process, may exceed the time-frame of funding availability.³⁵ Timely acquisition, to meet the economic stimulus intent of ARRA, may

³³ The ASHRAE initiative, known as the Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, or Standard 189, is being developed with the U.S. Green Building Council (USGBC) and the Illuminating Engineering Society of North America (IESNA), and could ultimately become a prerequisite under the LEED rating system. <http://archrecord.construction.com/news/daily/archives/080131standards.asp>.

³⁴ U.S. Congress, Joint Committee of Conference, *Joint Explanatory Statement - Division A to Accompany H.R. 1 - American Recovery and Reinvestment Act of 2009*, committee print, 111th Cong., 1st sess., February 12, 2009.

³⁵ See CRS Report RL34026, *Defense Acquisitions: Overview, Issues, and Options for Congress*, by Moshe Schwartz.

also depend on having an adequately trained acquisition workforce in place. Given the lack of rules, comparatively high funding level, and short obligation period, Congress may wish to consider whether DOD may act effectively on the provisions.

Finally, though DOD's average utility energy costs fall in the range of national energy prices, Congress may wish to consider how DOD's energy costs (not just consumption) could be reduced further. As the single largest national energy consumer, DOD might leverage its buying power in negotiating lower utility rates.

Appendix. Legislation

Table A-I. Legislation Introduced Since the 107th Congress Addressing DOD Facility Energy Consumption

Congress	Bill #	Sponsor	Bill Title	Subject Area
107 th	H.R. 4546	Rep. Stump	Bob Stump National Defense Authorization Act for Fiscal Year 2003 12/2/2002 Became Public Law No: 107-314 [from summary of conference bill] “(Sec. 245) Directs the Secretary to carry out a vehicle fuel cell technology development program in cooperation with the Secretary of Energy, appropriate Federal agencies, and industry. Earmarks specified RDT&E funds for the program.” “Title XXIV: Defense Agencies - (Sec. 2401) Authorizes the Secretary to acquire real property and carry out military construction projects in specified amounts at specified installations and locations. Authorizes the Secretary to carry out certain energy conservation projects.” “Title XXVIII: General Provisions - Subtitle A: Military Construction Program and Military Family Housing Changes - “(Sec. 2803) Authorizes the Secretary of the Navy to: (1) carry out up to three pilot projects to use the private sector for the acquisition or construction of military unaccompanied housing in the United States, including any U.S. territory or possession; and (2) assign members of the armed forces to such housing. Authorizes the Secretary of Defense to set higher rates of partial basic allowance for housing for members assigned to such units. Utilizes the Department of Defense Housing Improvement Fund to carry out activities under the pilot projects. Authorizes a transfer to such Fund, subject to 90 days prior notification of the appropriate congressional committees, from amounts appropriated for construction of military unaccompanied housing projects in military construction accounts. Requires a report from the Secretary of the Navy to the appropriate congressional committees on pilot project activities and related contractual information. Terminates	Vehicle fuel cell technology development Energy conservation projects by defense agencies. Military housing

Congress	Bill #	Sponsor	Bill Title	Subject Area
			pilot project authority at the end of FY 2007.”	
				
			“(Sec. 2805) Allows up to two-thirds of energy savings realized at military installations to remain available until expended (currently, available for up to two years).”	
107 th	S. 1358	Sen. Bayh	Federal Facility Energy Management Act of 2001. “Amends the Energy Conservation and Production Act to provide that Federal building energy efficiency standards shall contain specifications that meet or exceed those of the International Residential Code. Instructs the Secretary of Energy to promulgate revised Federal building energy efficiency performance standards following prescribed guidelines. Amends the Department of Energy Organization Act (DOE) to establish within DOE the Office of Federal Energy Productivity. Amends the National Energy Conservation Policy Act to mandate that each agency: (1) apply energy conservation measures to its Federal facilities so that specified energy reduction is implemented following prescribed calendar year percentages; (2) meter or submeter its energy use; and (3) procure specified energy efficient products. Instructs the Architect of the Capitol to develop and implement energy and water savings measures in congressional buildings. Declares that the aggregate annual payments by a Federal agency under an energy savings performance contract may take into account savings resulting from certain reduced costs of operation and maintenance. Establishes the Federal Energy Bank to make loans to Federal agencies to implement energy savings performance projects. Amends the Energy Policy Act of 1992 to prescribe: (1) minimum average fuel economy guidelines for the Federal vehicle fleet; and (2) operating parameters for the use of alternative fuels. “	Federal buildings energy efficiency standards.
107 th	S. 1418	Sen. Levin	Military Construction Authorization Act for Fiscal Year 2002. For further action, see S. 1438, which became P.L. 107-107 on 12/28/2001. “Title XXIV: Defense Agencies - Authorizes the Secretary of Defense to acquire real property and carry out military construction projects in specified amounts at specified installations and locations. Authorizes the Secretary to carry out certain energy conservation projects. Authorizes	Energy conservation projects by defense agencies. Pilot Efficient Facilities Initiative.

Congress	Bill #	Sponsor	Bill Title	Subject Area
			appropriations to the Department of Defense (DOD) for fiscal years after 2001 military construction, land acquisition, and military family housing functions of DOD. Limits the total cost of construction projects authorized by this title.” “Subtitle B: Real Property and Facilities Administration - Amends the Federal Property and Administrative Services Act of 1949 to make the proceeds of sales of DOD property from a closed military installation available for facility maintenance and repair or environmental restoration by the military department that had jurisdiction over such property.” “(Sec. 2812) Authorizes the Secretary to carry out a pilot program, to be known as the Pilot Efficient Facilities Initiative, to determine the potential for increasing the efficiency and effectiveness of the operation of military installations. Authorizes the Secretary to designate up to two installations of each military department to participate (requiring notification to the defense committees of the installations chosen). Requires a management plan for each installation. Establishes in the Treasury the Installation Efficiency Project Fund to manage capital assets and provide support services at participating installations. Terminates the Secretary’s authority to carry out the Initiative four years after the enactment of this Act. Requires a report to Congress.”	
107 th	S. 2514	Sen. Levin	Bob Stump National Defense Authorization Act for Fiscal Year 2003. Note: H.R. 4546 and S. 2514 were defense authorization bills from the House and Senate Armed Services Committees respectively. On 6/27/2002, the Senate substituted S. 2514 in H.R. 4546, as passed Senate. For further action, see H.R. 4546, which became Public Law 107-314 on 12/2/2002. [“(Sec. 218) Earmarks specified Navy RDT&E funds for the demonstration of renewable energy use program.” Included in amended Senate passed bill, not in final P.L.] “(Sec. 244) Directs the Secretary to carry out a vehicle fuel cell technology development program in cooperation with the Secretary of Energy, the heads of appropriate Federal agencies, and industry. Earmarks specified RDT&E funds for the program.” “Title XXIV: Defense Agencies - Authorizes the Secretary to acquire real	Renewable energy demonstration Vehicle fuel cell technology development Energy conservation projects by defense agencies. Military housing

Congress	Bill #	Sponsor	Bill Title	Subject Area
107 th	S. 2515	Sen. Levin	property and carry out military construction projects in specified amounts at specified installations and locations. Authorizes the Secretary to carry out certain energy conservation projects. Authorizes appropriations to DOD for fiscal years after 2002 for military construction, land acquisition, and military family housing functions of DOD. Limits the total cost of construction projects authorized by this title.” Bob Stump Department of Defense Authorization Act for Fiscal Year 2003. “Note: S. 2515 corresponded to S. 2514 Division A (Department of Defense authorization). For further action, see H.R. 4546, which became P.L. 107-314 on 12/2/2002.” [“(Sec. 218) Earmarks specified Navy RDT&E funds for the demonstration of renewable energy use program.” Included in amended Senate passed bill, not in final P.L.] “(Sec. 244) Directs the Secretary to carry out a vehicle fuel cell technology development program in cooperation with the Secretary of Energy, the heads of appropriate Federal agencies, and industry. Earmarks specified RDT&E funds for the program.”	
108 th	H.R. 3339	Rep. Wilson	National Defense Energy Savings Act of 2003. “Authorizes the Secretary of Defense to: (1) enter into an energy savings performance contract (for a period of up to 25 years) for the sole purpose of achieving ancillary energy savings and benefits; and (2) incur obligations under the contract to finance energy conservation measures so long as guaranteed savings exceed the debt service requirements. Directs the Secretary to issue final rules establishing implementation procedures and methods that meet specified requirements. Authorizes the Secretary to implement a pilot program to enter into up to ten energy savings performance contracts in nonbuilding applications.	Energy Savings Performance Contracts
108 th	S. 2318	Sen. Collins	National Defense Energy Savings Act of 2004. “Authorizes the Secretary of Defense to: (1) enter into an energy savings performance contract in order to achieve energy savings and ancillary benefits; (2) incur obligations under the contract to finance energy conservation measures so long as guaranteed savings exceed the debt service requirements; and (3) implement a pilot program to enter into up	Energy Savings Performance Contracts

Congress	Bill #	Sponsor	Bill Title	Subject Area
			to ten energy savings performance contracts for the purpose of achieving energy savings, secondary savings, and incidental benefits, in nonbuilding applications.	
			Sets forth implementation guidelines, including contract terms and conditions."	
109 th	H.R. 3263	Rep. Wamp	Energy Efficiency Cornerstone Act of 2005.	Federal buildings energy efficiency standards.
			"Amends the Energy Conservation and Production Act (ECPA) to: (1) subject federal building performance standards to the 2004 International Energy Conservation Code; and (2) require all housing constructed under the military housing privatization initiative of the Department of Defense to be Energy Star qualified and equipped with Energy Star appliances and FEMP designated appliances, including Energy Star lighting."	Military housing Energy Star rated.
			"Amends EPCA and the Energy Policy Act of 1992 to modify compliance requirements governing alternative fuel use by light duty federal vehicles."	Alternative fuel use by light duty federal vehicles.
			"Amends federal transportation law to modify standards for executive agency automobiles."	
109 th	S. 2025	Sen. Bayh	Vehicle and Fuel Choices for American Security Act.	Federal fleet reduced petroleum consumption.
			"Directs the Secretary of Energy to issue regulations requiring that by FY2016 each federal agency achieve at least a 30% reduction in its fleet petroleum consumption."	
109 th	S. 2747	Sen. Bingaman	Enhanced Energy Security Act of 2006.	Federal fleet reduced petroleum consumption.
			"Amends the Energy Policy and Conservation Act to set forth federal fleet conservation requirements to achieve reduced petroleum consumption."	Federal government renewable energy consumption requirement - electricity and transportation fuel.
				
			"Amends the Energy Policy Act of 2005 to: (1) provide loan guarantees for fuel-efficient automobile manufacturers and suppliers; and (2) require that the federal government consume specified amounts of renewable energy."	Energy savings performance contracts.
				
			"Amends the Public Utility Regulatory Policies Act of 1978 to: (1) set forth a federal renewable portfolio standard; and (2) require state regulatory authorities to implement energy efficiency resource programs	

Congress	Bill #	Sponsor	Bill Title	Subject Area
			that include electric utilities and gas utilities.”	
			“Amends the National Energy Conservation Policy Act to authorize a federal agency to: (1) enter into a separate contract for energy services and conservation measures; and (2) provide the financing necessary to implement such contract.”	
110 th	H.R. 670	Rep. Engel	Dependence Reduction through Innovation in Vehicles and Energy Act. “Directs the Secretary of Energy to: (1) require at least a 20% reduction in the federal fleets’ petroleum consumption (including that at least 30% of federal vehicles required to be alternative fuel vehicles be flexible fuel hybrid or flexible fuel plug-in hybrid vehicles); (2) submit to Congress an action plan calling for a specified graduated percentage of the nation’s ground fuel demand to be supplied by fuels derived from sources other than oil; and (3) carry out a plug-in hybrid electric vehicle prize program.”	Federal fleet reduced petroleum consumption. Federal fleet requirement for flexible fuel - hybrid or plug-in hybrid vehicles.
110 th	H.R. 6729	Rep. Dingell	To encourage greater energy efficiency in building codes Update national Model Building Codes by 30% in editions of each model code or standard released after 2010, and 50% after 2020.	State Building energy efficiency codes.
110 th	S. 1602	Sen. Hagel	Clean, Reliable, Efficient and Secure Energy Act of 2007. “Requires the total amount of fuel utilized by the Department of Defense in a calendar year to be coal-to-liquid fuel, gas-to-liquid fuel, or both.” “Prescribes requirements governing energy efficiency in federal buildings and public schools.”	Coal-to-liquid or gas-to-liquid fuel requirement. Federal buildings energy efficiency standards
111 th	H.R. 1	Rep. Obey	American Recovery and Reinvestment Act (ARRA) of 2009 (P.L. 111-5) Covering expenses associated with maintaining the physical plant at DOD posts, camps and stations, the conference agreement directs \$3,686,500,000 toward investment in energy efficiency projects and to repair and modernize DOD facilities. The funding is available only for facilities in the United States and its territories, and remains available for obligation until September 30, 2010. The conference agreement provides \$300,000,000, split equally among Army; Air Force, Navy, and Defense-wide for funding of research, development, test and evaluation projects, including pilot projects, demonstrations and energy efficient manufacturing enhancements. The funds remain available for obligation until September 30, 2010 for	Defense Facilities Sustainment, Restoration and Modernization Near Term Energy Efficiency Technology Demonstrations and Research

Congress	Bill #	Sponsor	Bill Title	Subject Area
			improvements in energy generation and efficiency, transmission, regulation, storage, and for use on military installations and within operational forces, to include research and development of energy from fuel cells, wind, solar, and other renewable energy sources to include biofuels and bioenergy.	

Source: Compiled by Carol Glover, CRS Information Research Specialist.

Notes: From LIS Bill Summary (as introduced).

Table A-2. National Defense Authorization Acts

Public Law	Title
P.L. 106-65	National Defense Authorization Act for FY2000. Sec. 2404. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2405(a)(6), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$1,268,000.
P.L. 106-398	Floyd D. Spence National Defense Authorization Act for FY2001. Sec. 2402. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2403(a)(7), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$15,000,000.
P.L. 107-107	National Defense Authorization Act for FY2002. Sec. 2402. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2403(a)(6), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$27,100,000.
P.L. 107-314	Bob Stump National Defense Authorization Act for FY2003. Sec. 2403. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2404(a)(6), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$34,531,000.
P.L. 108-136	National Defense Authorization Act for FY2004. Sec. 2404. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2405(a)(6), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$50,000,000.
P.L. 108-375	Ronald W. Reagan National Defense Authorization Act for FY2005. Sec. 2403 Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2404(a)(7), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$50,000,000.
P.L. 109-163	National Defense Authorization Act for FY2006. Sec. 2402 Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2403(a)(5), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$50,000,000.
P.L. 109-364	John Warner National Defense Authorization Act for FY2007. Sec. 2403 Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2405(a)(6), the Secretary of Defense may carry out energy conservation projects under section 2865 of title 10, United States Code, in the amount of \$55,000,000.
P.L. 110-181	National Defense Authorization Act for FY2008. Sec. 2402. Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2403(a)(7), the Secretary of Defense may carry out energy conservation projects under chapter 173 of title 10, United States Code, in the amount of \$70,000,000.
P.L. 110-417	Duncan Hunter National Defense Authorization Act for FY2009. Sec. 2402 Energy Conservation Projects. Using amounts appropriated pursuant to the authorization of appropriations in section 2403(a)(6), the Secretary of Defense may carry out energy conservation projects under chapter 173 of title 10, United States Code, in the amount of \$90,000,000.

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