



# Department of Defense Facilities and Vehicles Energy Use, Strategies and Goals

## **Program Overview**

**Quality Construction Alliance (QCA)**

**May 11, 2009**



# DoD Asset Management Strategy

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- **Comprehensive Approach**
  - Defense Infrastructure Strategic Plan
  - Infrastructure Investment Management Strategy
- **Tools**
  - Conservation and Demand Reduction
    - Facility Energy Audits – Metering/Benchmarking
    - Energy Conservation Investment Program (ECIP)
    - Energy Savings Performance Contracts (ESPCs),
    - Utility Energy Services Contracts (UESCs)
    - Enhanced Use Lease (EUL) / Power Purchase Agreements (PPA)
  - Renewable/Alternative Technologies
    - Wind/Solar/Geothermal/Biomass/Ocean/Hydrogen
  - Sustainable Design/Development Practices (High Performance bldgs)
  - Sustainable Infrastructure and Utilities Privatization
  - Awareness Programs
  - Coordinated Resource Development

# OSD Energy Policy

Initiatives Actions	Strategies	Goals	Grand Challenges	Mission	Vision
<b>Utility Privatization</b> <ul style="list-style-type: none"> <li>• Issue guidance</li> <li>• Demonstrate benefits</li> <li>• High % of success</li> <li>• Technology (better data)</li> <li>• Right people involved</li> </ul>	<b>Utility Privatization</b> <ul style="list-style-type: none"> <li>• Align efforts</li> <li>• Ensure proficiency</li> <li>• Execute efficiently and effectively</li> </ul>	<b>Complete utility privatization</b>	<b>Modernize infrastructure</b>	<b>Ensure that the DoD utility infrastructure is secure, safe, reliable and efficient, that energy and Water commodities are procured effectively and efficiently, and that the components maximize energy and water conservation efforts.</b>	<b>100 % reliability of utility services to the Warfighter</b>
<b>Bring all systems to C2 level</b>	<b>Transition from utility privatization to utility mgmt.</b>	<b>Meter energy consumption at all facilities</b>			
<b>Embrace Sustainable Design</b> <ul style="list-style-type: none"> <li>• LCC Analysis</li> <li>• W B Design Guide</li> </ul>	<b>Implement conservation measures and reduce cost</b>	<b>Sound stewardship/management of systems</b>	<b>Increase utility and energy conservation and demand reduction</b>		
<b>Enhance recognition</b> <ul style="list-style-type: none"> <li>• Showcase facilities</li> <li>• Awards</li> <li>• Training</li> </ul>	<b>Achieve/increase energy awareness</b>	<b>Reduce energy consumption</b>			
<b>Implement meter policy</b> <ul style="list-style-type: none"> <li>• Benchmarking</li> <li>• Accuracy in accounting/billing</li> <li>• Energy Star Buildings</li> </ul>	<b>Improve Energy Efficiency</b> <ul style="list-style-type: none"> <li>• Development</li> <li>• Investment</li> </ul>	<b>Reduce greenhouse gases</b>	<b>Improve energy flexibility</b>		
<b>Implement appropriate Distributive Energy Resources</b>	<b>Expand use of renewable energy</b>	<b>Increase use and production of renewable energy</b>			
<b>Pursue energy funding</b> <ul style="list-style-type: none"> <li>• Congressional appropriations</li> <li>• Private sector investments</li> </ul>					
<b>Increase efficiency products use</b> <ul style="list-style-type: none"> <li>• Energy Star</li> <li>• Alternative fuels</li> </ul>					
<b>Promote renewable energy</b> <ul style="list-style-type: none"> <li>• Purchases</li> <li>• Self-generated</li> </ul>					



## DoD Real Property (2008)

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- 545,714 Facilities
  - 316,238 Buildings
  - 181,591 Structures
  - 47,885 Linear Structures
- 29.8 million acres of Land
- 536 Installations
  - 5,429 DoD Sites

Data source: Base Structure Report (BSR) FY 2008

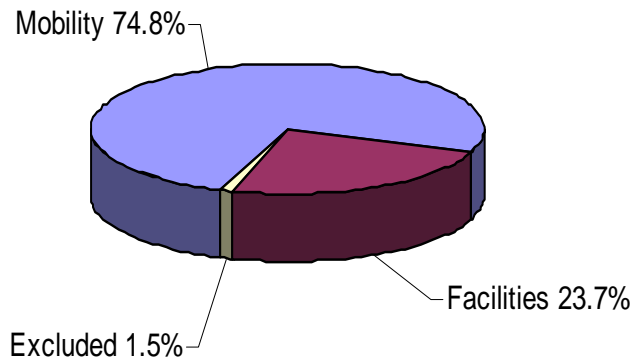


# FY08 DoD Energy Use

## Total Site-delivered Energy (BTU)

### Application

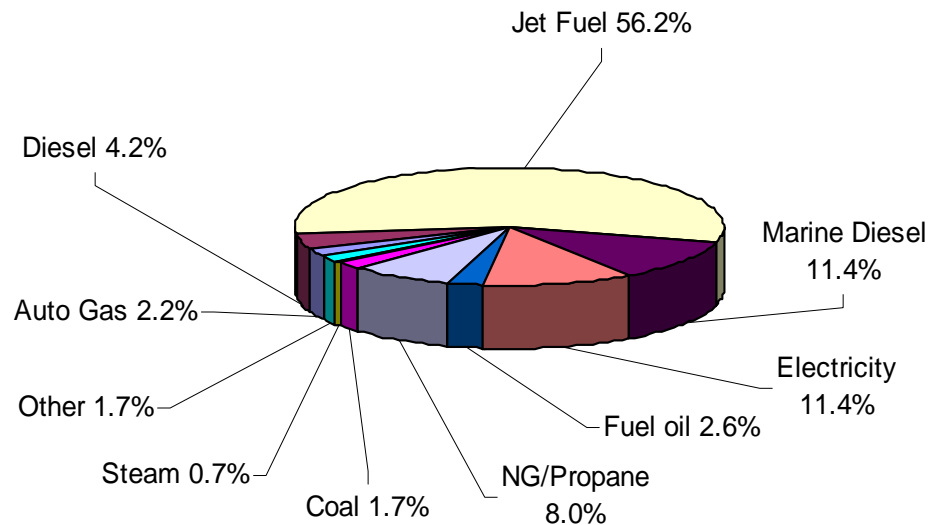
FY08 consumption by BTU



***Nation's single largest energy user***  
*(Used 0.8% of total U.S. & 78.6% of Federal energy in FY 2006)*

### Commodity

FY08 consumption by BTU



**\$20.0B**

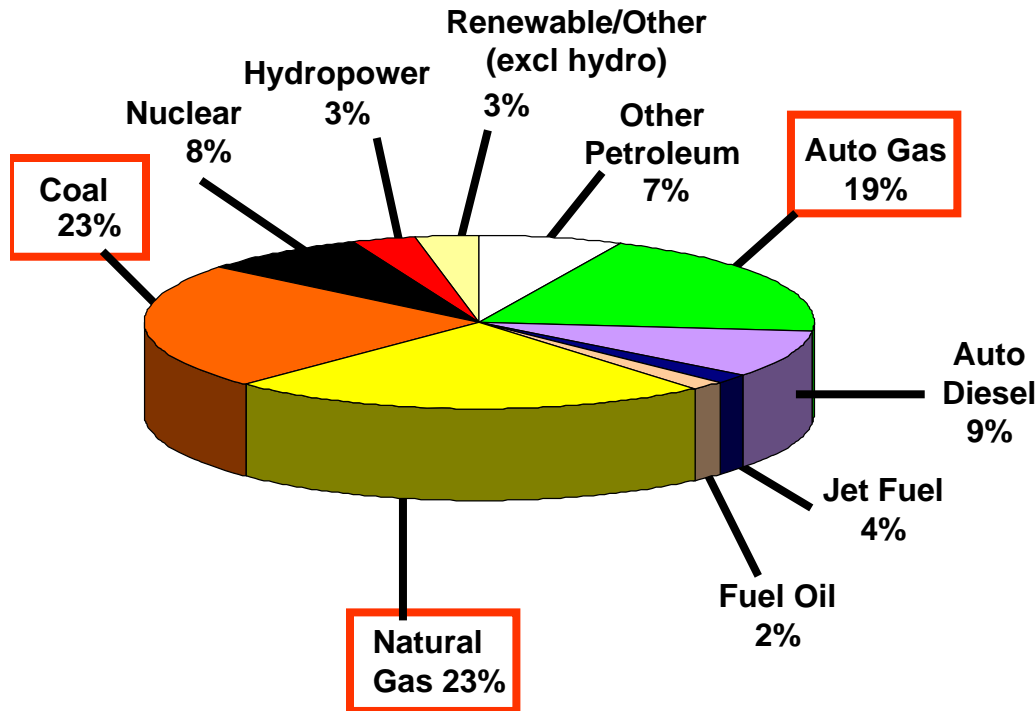
**889 Trillion BTU**



# Energy Consumption 2006

## - DoD Compared to Rest of US -

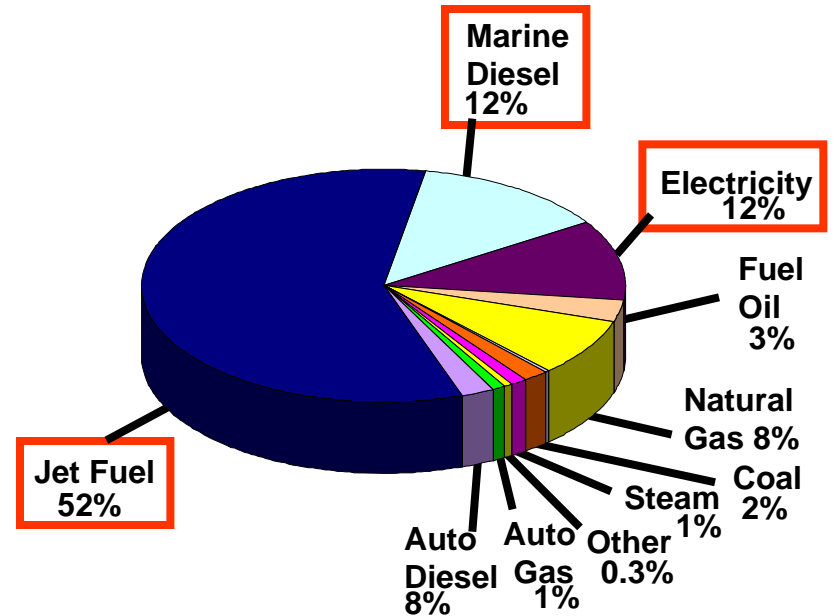
### US Energy Consumption by Type



Source: EIA 2005 consumption data

### DoD Energy Consumption by Type

Represents 0.8% of US consumption



Source: DoD Annual Energy Report for FY06

**DoD/DOE working on different challenges**



# Energy Policy Act of 2005

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- Federal Facilities Provisions
  - Energy Reduction Goals - 20% by FY 2015 (overridden)
  - **Energy Efficient Buildings - 30% better than ASHRAE standards (109)**
  - Renewable Energy – Purchase 3% in 2007 -2009, 5% in 2010 – 2012, 7.5% in 2013 and beyond; only allows electricity to be counted toward this requirement. (203)
  - Energy Efficient Products - Energy Star or FEMP designated products (104)



# Executive Order 13423

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- Strengthening Federal Environmental, Energy and Transportation Management
- Federal Facilities Provisions
  - **Energy Reduction Goals - 3% per year or 30% by FY 2015**
  - At least half of required Renewable Energy from sources placed in service after Jan 1, 1999. Counts thermal as well as electrical energy. (Allows non-electric.)
  - Implement renewable energy generation projects on agency property for agency use
  - Water consumption intensity reduced 2% annually or 16% by FY 2015 - begins 08
  - **New construction and major renovation follow High Performance Bldg MOU**
    - **Designed for Energy Star targets and 30% better than ASHRAE 90.1-2004.**
    - **Renovations 20% better than 2003 baseline**
    - **Install building level meters in all construction and major renovation**
    - 20% less potable water use than baseline after meeting EPA Act 1992 requirements
    - 50% reduction in outdoor water use from conventional means
    - **Achieve minimum 2% daylight factor in 75% of space for visual critical tasks**
  - **15% of existing inventory incorporate above guidelines by end of FY 2015**
  - **100% of new designs meet HPB standards**
- Revokes EO 13123



# FY 2008 Metrics and Performance (Facilities)

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- Facility energy goals (EPAct 2005 and EO 13423 combined)
  - Reduce goal facility consumption 3% per year -  
**10.7%** : 9% for 2008: Goal continues to 30% in 2015
  - Purchase/generate 2.5% renewable energy -  
**2.9%** : 3% for 2008: Goal continues to 7.5% in 2013
  - Water intensity reduction 2% per year –  
**2.9%** : 2% for 2008; Goal continues to 16% in 2015  
Set baseline in 2007 of 59.8 gallons / GSF
  - Percentage of electricity metered by (100% by 2012) -  
45.8% standard, 13.8% advanced, 59.6% total
  - Percentage of new designs 30% better than ASHRAE –  
**93%** of FY 2010 MILCON program
  - Produce or procure 25% renewable energy by 2025  
**9.8%** on track to exceed goal



## Energy Independence and Security Act (EISA) of 2007

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- **Codifies the 3% annual energy reduction or 30% by 2015 (431)**
- An energy manager must be designated for “appropriate” Federal facilities covering at least 75% of an agency’s energy use (432)
- Energy and water evaluations for 25% of facilities annually and all appropriate facilities on 4 year cycle (432)
- Energy and water conservation measures be entered and annually updated in a “to be created” web based tracking tool (432)
- Metering data entered into a web based benchmarking database (432)
- OMB to issue scorecards (432)
- **Reduce the use of fossil fuels in new and renovated building by 55% in 2010 increasing to 100% in 2030 (433)**
- DoE to identified a federal green building certification system (433)
- Large capital investments must be the most energy efficient design that is life cycle cost effective. Process in place by July 08 (434)
- Adds Natural Gas and Steam metering requirements by Oct 2016 (434)



## EISA 2007 (continued)

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- Removes ESPC Congressional pre-notification requirement (511)
- No agency limits of less than 25 years or max obligation on ESPC (513)
- Permanently reauthorizes ESPC (514)
- Adds cogeneration and heat recovery, and water conservation as “energy savings” for ESPC. Does not specify renewable energy (515)
- Allows sale of excess renewable energy (515)
- Allows all savings to be retained on site. (No method for doing this) (516)
- **30% of hot water in new and renovated federal buildings from solar (523)**
- Requires annual submittal to OMB covering: compliance, status of efficiency implementation and GHG reductions, and savings (527)
- Several appliance energy efficiency and procurement standards
- Joint DoE/DoD study of energy and cost savings in non-building applications (518)



## NDAA 2008 (HR 4986)

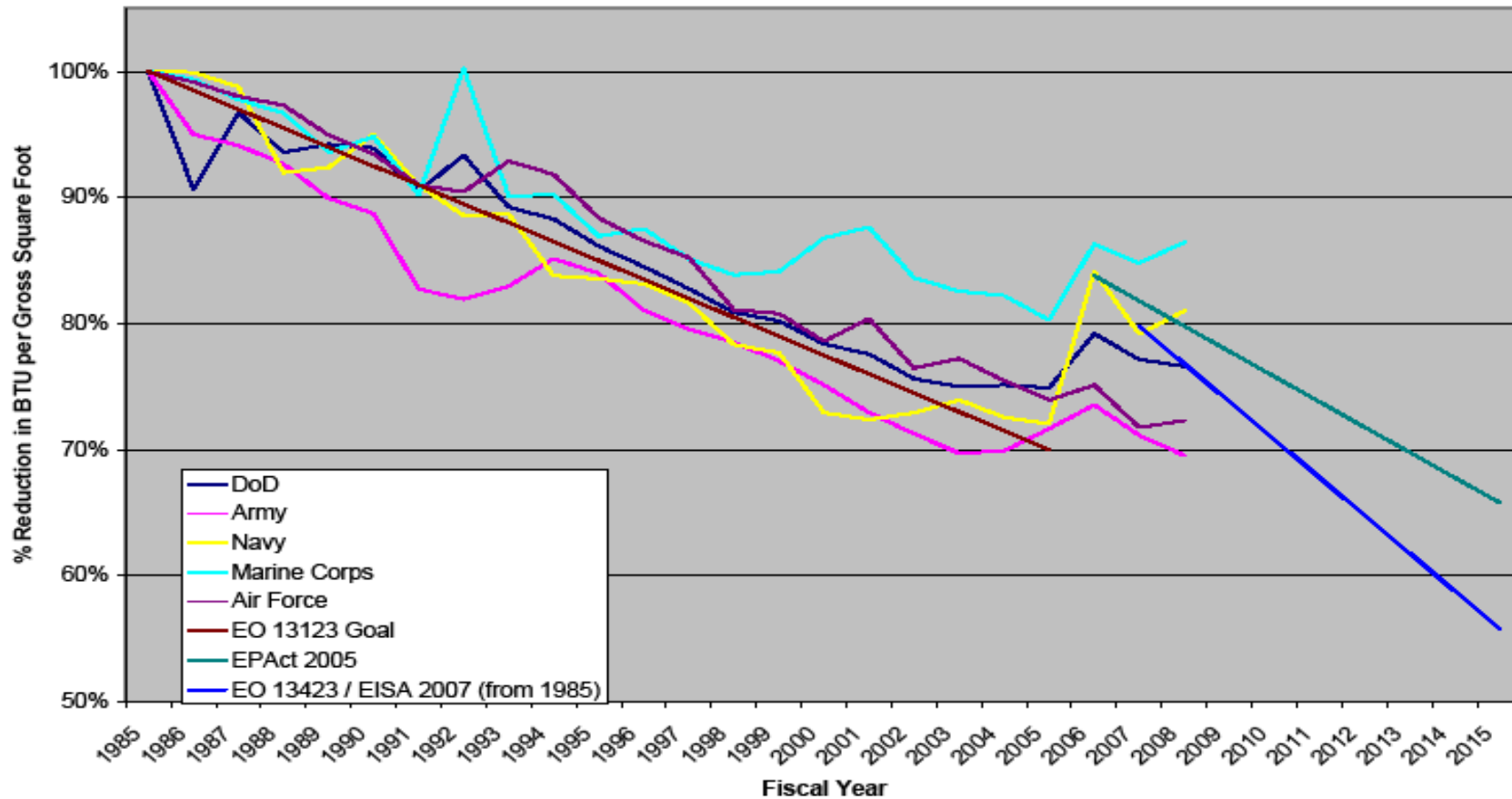
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- Allows contracts for renewable energy up to 10 years (828)
- \$70 M for FY 2008 ECIP.
- Removes ESPC Congressional notification requirement (was \$7 M for DoD) (2861)
- **Requires the use of energy efficient lighting in all new construction and significantly altered buildings, and in the normal course of maintenance 1 year from date of enactment. Energy Star bulbs meet requirement. Secretary may waive requirement (2863)**
- Required renewable energy report by May 2008.
- Required water conservation report by April 2008.



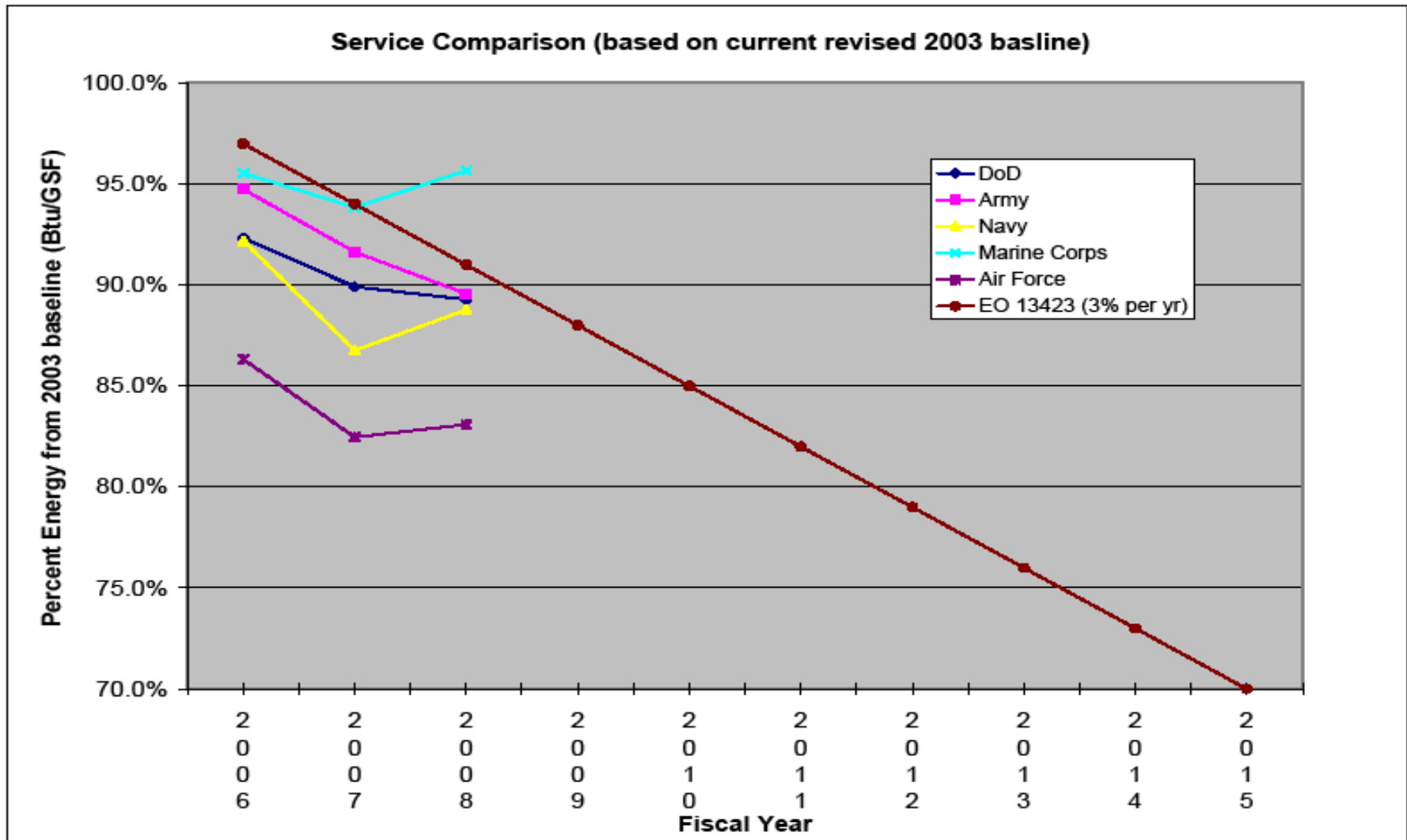
# Performance – facility energy reduction

**Facility Energy Reduction - Service Progress Comparison**  
(With renewable credits applied)





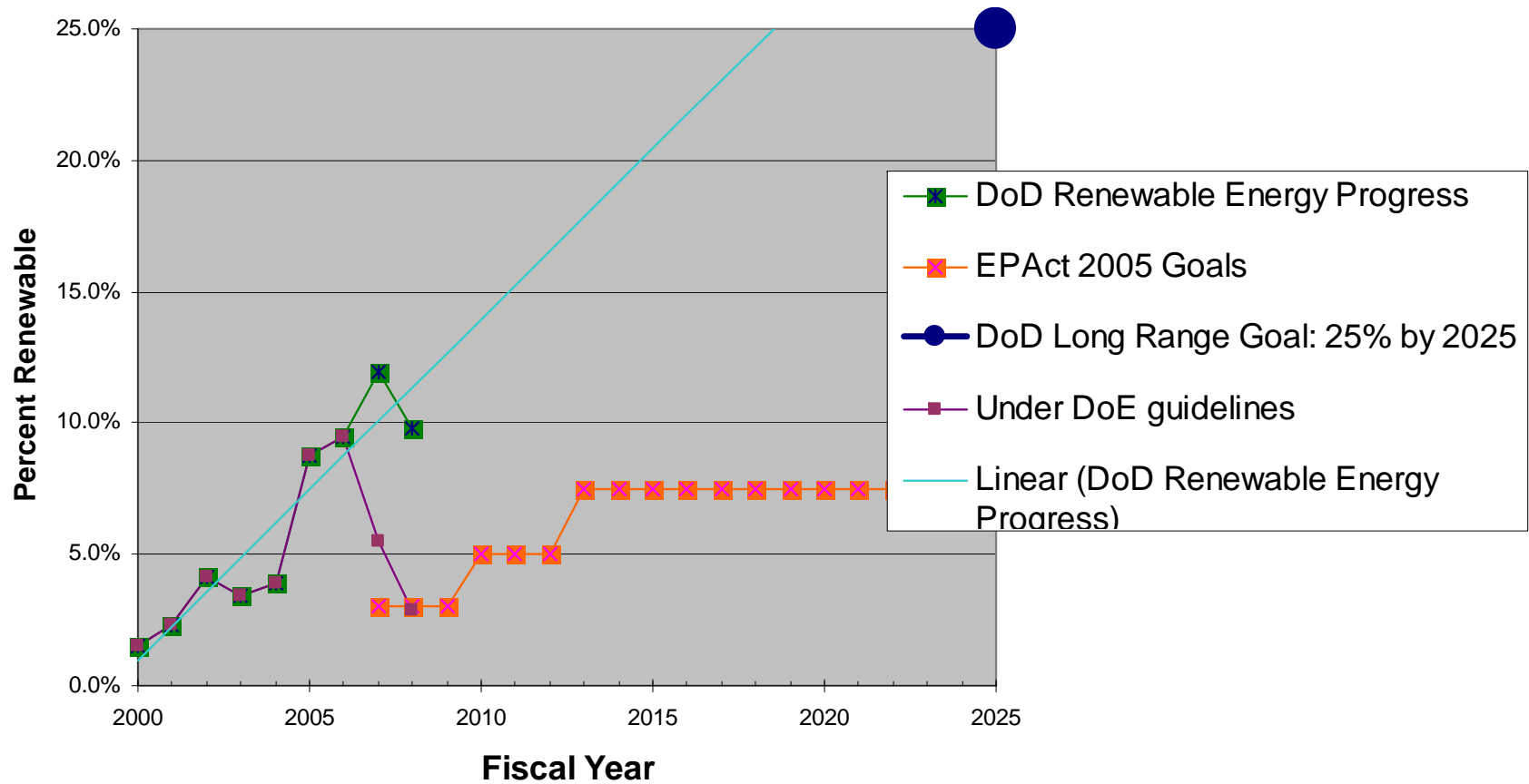
# DoD Facility Energy Intensity





# DoD Renewable Energy Progress

## DoD Renewable Energy Progress





# DoD ARRA 2009 Program

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- \$7.4 billion in Defense-related appropriations:
  - \$4.2 billion in Operation and Maintenance accounts to improve, repair, and modernize DoD facilities, including energy-related improvements
  - \$1.3 billion in military construction for hospitals
  - \$240 million in military construction for child development centers
  - \$100 million in military construction for warrior transition complexes
  - \$535 million for other military construction projects, such as housing for Service members and their families, energy conservation, and National Guard facilities
  - \$300 million to develop energy-efficient technologies (RDT&E)
  - \$120 million for the Energy Conservation Investment Program (ECIP)
  - \$555 million for a temporary expansion of the Homeowner's Assistance Program (HAP) benefits for private home sale losses of DoD military and civilian personnel
  - \$15 million for DoD Inspector General oversight and audit of Recovery Act execution



# Concerns

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- Electrical Grid Reliability/Resilience
  - Work with DoE on National problem
  - Continue to increase energy efficiency
  - Continue to develop on/near site renewable energy sources
  - Defense/Task Critical Asset assurance
- EISA 432: audit annually 25% of facilities and track data in a DoE developed database
- **EISA 433: reduce fossil fuel based energy use in new and renovated buildings by 55% in FY 2010 increasing to 100% by 2030.**
- **EISA 523: generate 30% of hot water from solar in new and renovated buildings**



# Current OSD Focus

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- **Metering and Commercial Benchmarks**
- **Strategic Investment Plan**
  - Priorities for funding matched with best opportunities
  - ECIP \$90M in FY 2008, increased to \$120M in FY 2013
- **Increase use of Alternative Financing Contracts**
  - **ESPC, UESC, PPA, EUL, others**
- **Increased implementation of renewable energy**
  - FY 2008 ECIP: \$28.2M renewable projects (23); FY 2009 \$41.8M (27)
  - ARRA \$86M of \$120M renewable projects (33)
- **Complete utilities privatization program**
- **Comprehensive approach**
  - Mobility/transportation energy
  - Sustainable Design Templates
- **Partnership with DoE on Net Zero, Financing, & Techval**



# Final thoughts

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Providence, RI  
August 9-12, 2009

- ODUSD Energy website:  
<http://www.acq.osd.mil/ie/energy/index.shtml>
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