



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

**Program Overview**

**GovEnergy 2008**

**August 6, 2008**



# 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<br>Actions  | Strategies  | Goals  | Grand<br>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>Embrace Sustainable Design</b> <ul style="list-style-type: none"> <li>• LCC Analysis</li> <li>• W B Design Guide</li> </ul>  | <b>Transition from utility privatization to utility mgmt.</b>   | <b>Bring all systems to C2 level</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>Implement conservation measures and reduce cost</b>  | <b>Meter energy consumption at all facilities</b>      | <b>Improve energy flexibility</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>Achieve/increase energy awareness</b>  | <b>Sound stewardship/management of systems</b>         |  |  |  |
| <b>Implement appropriate Distributive Energy Resources</b>  | <b>Improve Energy Efficiency</b> <ul style="list-style-type: none"> <li>• Development</li> <li>• Investment</li> </ul>  | <b>Reduce energy consumption</b>                       |  |  |  |
| <b>Pursue energy funding</b> <ul style="list-style-type: none"> <li>• Congressional appropriations</li> <li>• Private sector investments</li> </ul>   | <b>Expand use of renewable energy</b>   | <b>Reduce greenhouse gases</b>                         |  |  |  |
| <b>Increase efficiency products use</b> <ul style="list-style-type: none"> <li>• Energy Star</li> <li>• Alternative fuels</li> </ul>  |   | <b>Increase use and production of renewable energy</b> |  |  |  |
| <b>Promote renewable energy</b> <ul style="list-style-type: none"> <li>• Purchases</li> <li>• Self-generated</li> </ul>   |   |  |  |  |  |



## DoD Real Property (2007)

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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

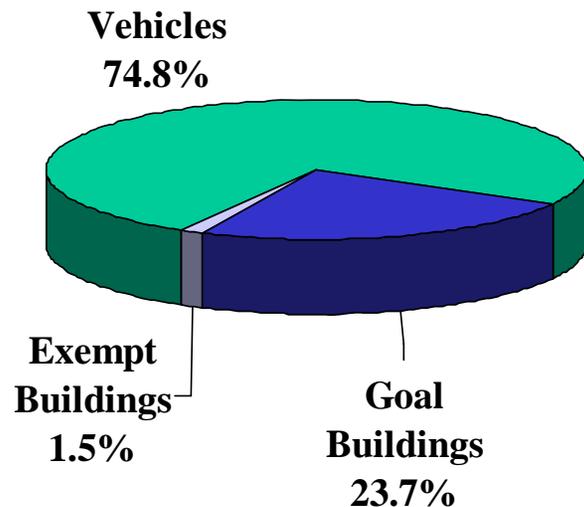
Data source: Facilities Assessment Database (FAD) 2007



# FY07 DoD Energy Use

Total Site-delivered Energy (BTU)

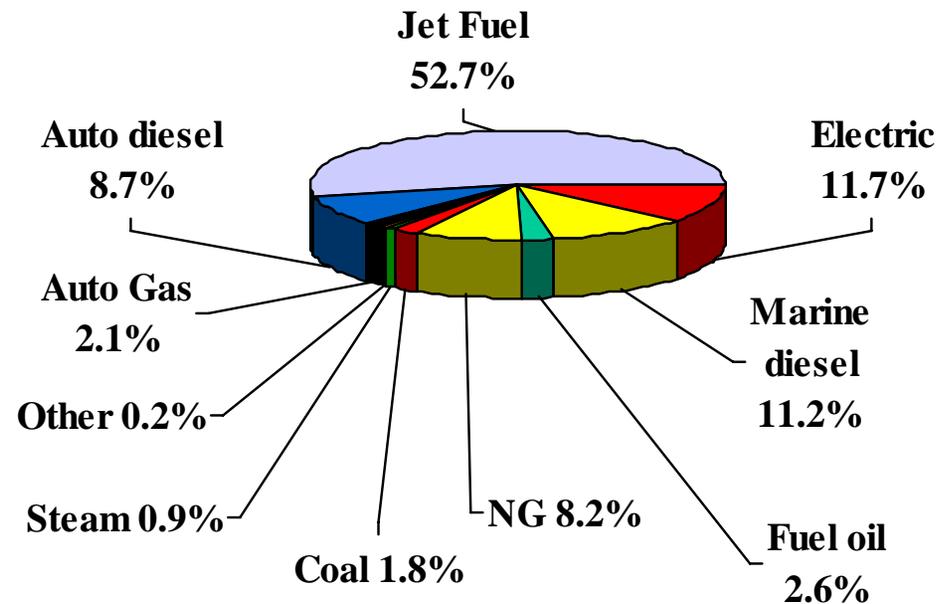
## Application



**Nation's single largest energy user**

*(Used 0.8% of total U.S. & 78.6% of Federal energy in FY 2006)*

## Commodity



**\$13.2B**

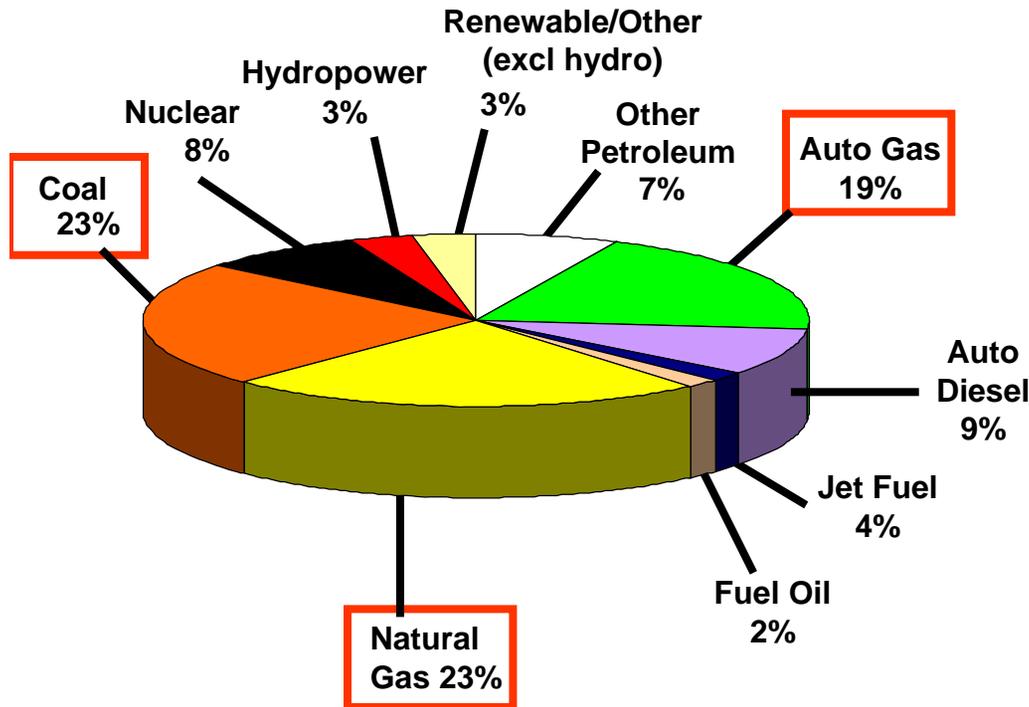
**864 Trillion BTU**



# Energy Consumption 2006

## - DoD Compared to Rest of US -

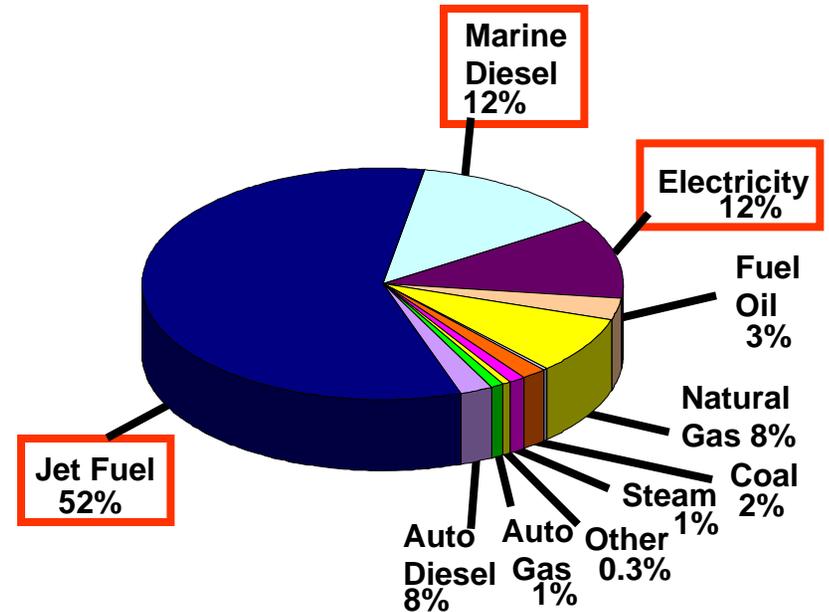
### US Energy Consumption by Type



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
  - 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.
  - Energy Efficient Products - Energy Star or FEMP designated products



# 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 - links GHG to goal
  - 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 2006 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
- Revokes EO 13123



# FY 2007 Metrics and Performance (Facilities)

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- Facility energy goals (EPAct 2005 and EO 13423 combined)
  - Reduce goal facility consumption by 3% per year -  
**10.1%** : 6% for 2007: Goal continues to 30% in 2015
  - Purchase/generate 2.5% renewable energy -  
**5.5%** : 3% for 2007: Goal continues to 7.5% in 2013
  - Water intensity reduction 2% per year –  
Set baseline in 2007 of 59.8 gallons / GSF
  - % of electricity metered by (100% by 2012) -  
30.6% standard, 3.3% advanced, 33.9% total
  - % new designs 30% better than ASHRAE –  
**39%** (Designs starts preceded requirement)
  - Produce or procure 25% renewable energy by 2025  
11.9% on track to exceed goal



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

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- Codifies the EO 13423 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)

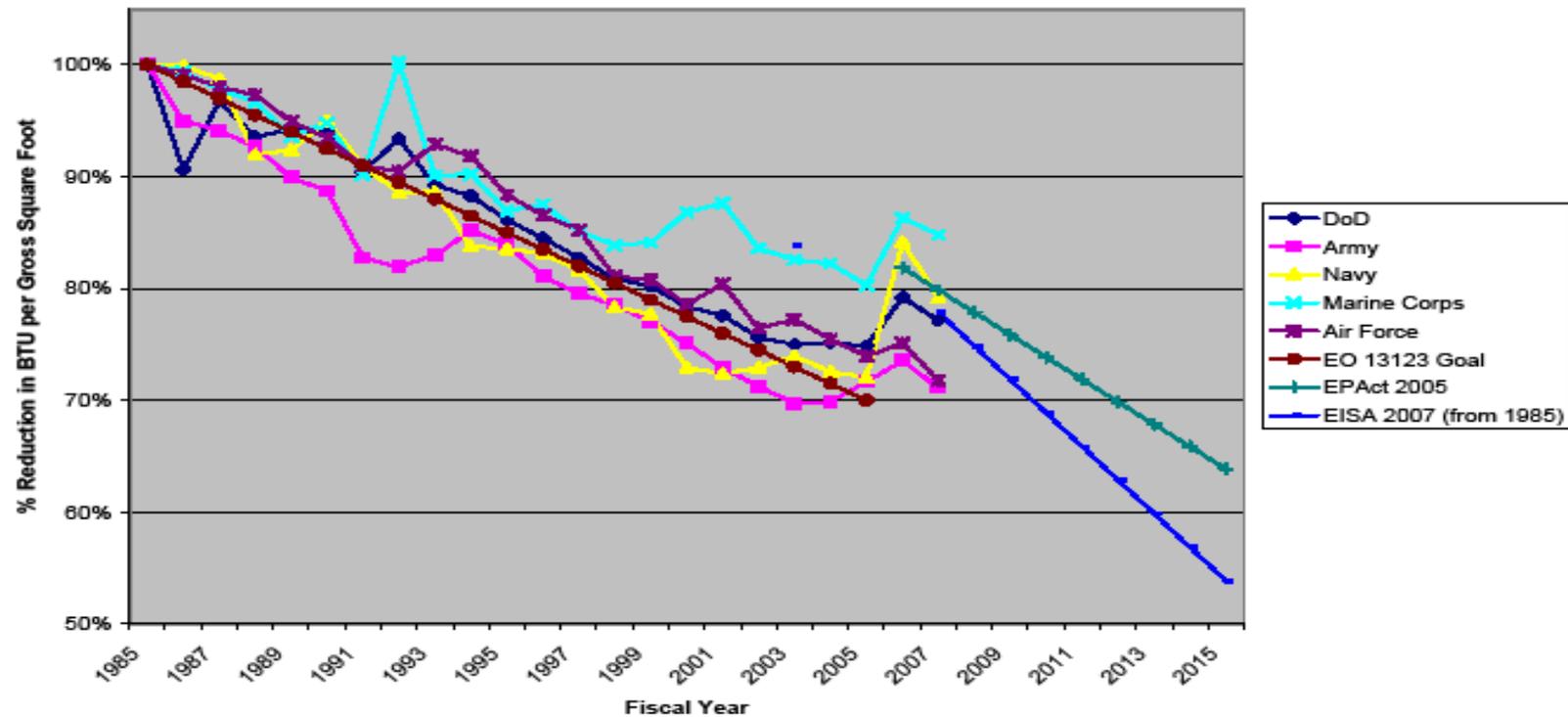
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- Allows contracts for renewable energy up to 10 years (828)
- \$70 M for FY 2008 ECIP.
- Removes ESPC Congressional notification requirement (was \$7 M for DoD) (2861)
- Redefines Alternative Fueled Vehicle for EPA Act 2005 (2862)
  - Hybrid, Fuel cell, and Lean Burn technology
  - Others that demonstrated to achieve significant petroleum reduction
- 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)
- Requires renewable energy report by May 2008. In draft. (2864)
- Requires water conservation report by April 2008. In draft. (CR)



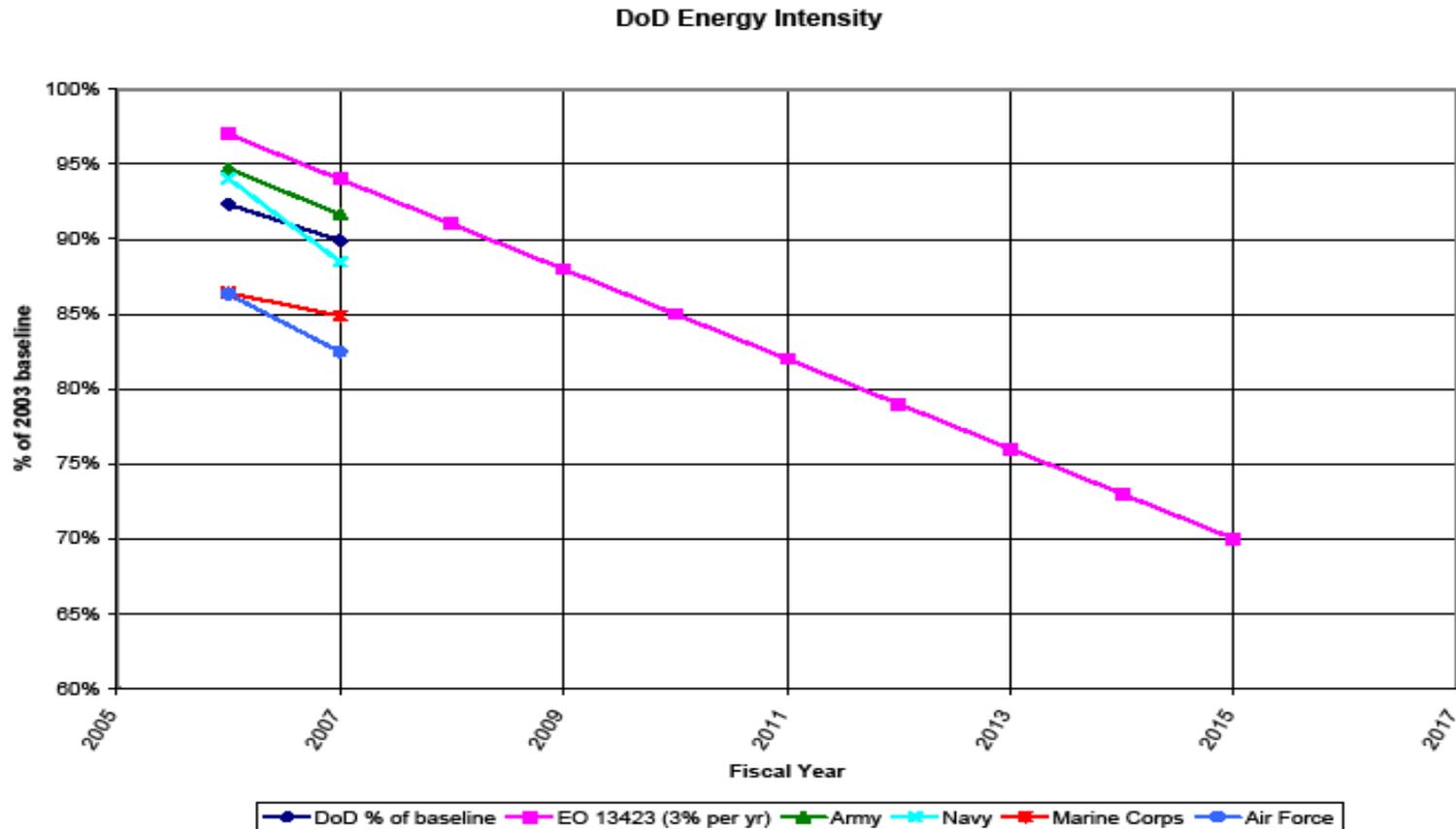
# Performance – facility energy reduction

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





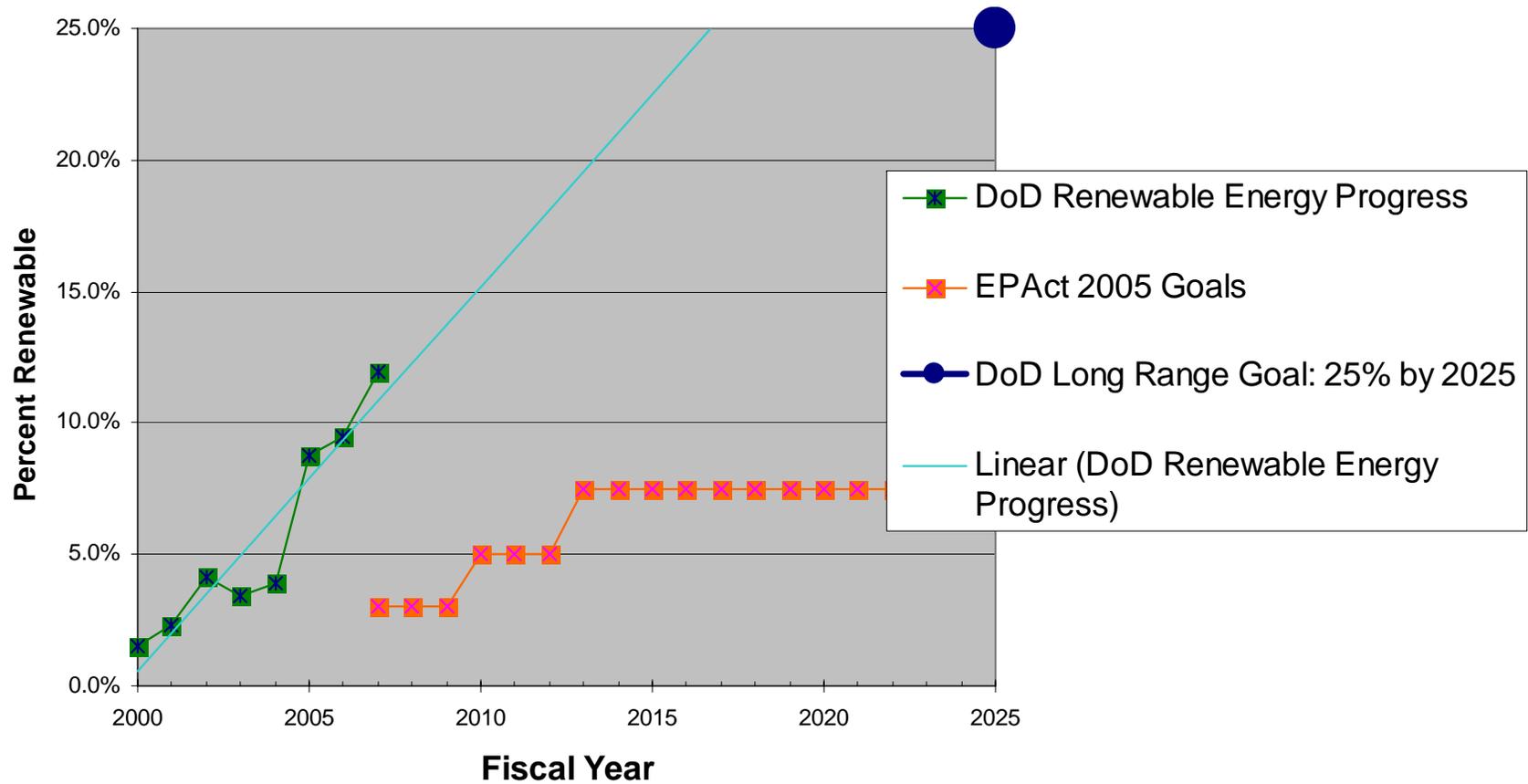
# DoD Energy Intensity





# DoD Energy Intensity

## DoD Renewable Energy Progress





# Energy Policy Act of 1992

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- Federal vehicle fleet energy management goals
  - Defined alternative fuels (AF) and alternative fuel vehicles (AFV)
    - New definitions is NDAA 2008, now includes:
      - Fuel cell (IRC 30B(b)(3))
      - Advanced lean burn technology (IRC 30B(c)(3))
      - Qualified hybrid (IRC 30B(d)(3))
      - Any other demonstrated (by GSA to DoE) to reduce petroleum consumption
  - Procure AFVs - 75% by FY 1999 and thereafter (in MSA)
  - Arrange for commercial refueling of AFVs to the maximum extent practicable (Need help here!)



# Energy Policy Act of 2005

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- Federal Vehicle Provision (701)
  - Operate dual fuel vehicles on alternative fuels unless Secretary of DoE waiver pursued
    - Waiver available based on fuel availability
      - Not within 5 miles or 15 minutes of normal route (Location)
    - Waiver available based on fuel being unreasonably expensive
      - DoE draft guidance says “no more expensive than gasoline”  
(This standard is still being developed)
      - Does not apply to GSA wet lease (majority of DoD inventory)
- 66% of DoD AFV waived for FY 2008.



# Executive Order 13423

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- Federal Vehicle Provision
  - Consumption baseline set to FY 2005
  - Reduce total consumption of petroleum products by 2% annually through FY 2015 (required 4% for FY 2007)
  - Increase total consumption of non-petroleum fuel by 10% per year (this is cumulative, i.e. 10% in FY 2007, 21% in 2008, 33.1% in FY 2009)
  - Use Plug-in hybrids (PHEV) when commercially available at a life cycle cost comparable to non-PHEV
- Revokes EO 13149
  - Reduce petroleum consumption - 20% by FY 2005
  - Use alternative fuels – to meet “a majority” of alternative fuel vehicle fuel requirements (retains EPA Act 2005 alt fuel requirement)
  - Increase miles per gallon (mpg) fleet fuel efficiency – 3% by 2005



## EISA 2007

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- Prohibits procurement of alternative fuel or synthetic fuel that has “life cycle greenhouse gas emissions” greater than conventional fuels (526)
  - Primary concern in synthetic fuel (i.e. CTL and GTL)
  - Could affect E85, oil shale, tar sands, etc
- Prohibits acquisition of any vehicle that is not “a low greenhouse gas emitting vehicle” (141)
- ‘Beginning in FY 2010 each agency shall reduce petroleum consumption and increase alternative fuel consumption so as to by Oct 1, 2015, and each year thereafter, achieve at least a 20% reduction in annual petroleum consumption and a 10% increase in annual alternative fuel consumption from the 2005 baseline’ (142)
- Each agency shall develop a plan and implement measures to comply with the requirements above (142)
- Not later than Jan 1, 2010, install at least 1 renewable fuel pump at each Federal fleet fueling center in the U.S. and report on such. DoD has an exemption for fueling centers with a fuel turnover rate of less than 100,000 gallons per year (246)



## OMB Scorecard requirements

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- Use of alternative fuel as a % of total consumption
  - Minimum 10% for green, 5% for yellow
- Inclusion of EO 13423 goals in appropriate position descriptions and performance evaluations.
- Retroactively changed petroleum reduction to start in 2006, rather than starting in 2007, based on 2005 baseline. Agencies are now responsible for a 6% (vice 4%) petroleum reduction in 2008.
- 10% annual reduction in the quantity of AFV waivers (2008 start), 5% for yellow.



# Imperatives for Privatizing Utilities

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- Utility ownership is not a core DoD function
- Missions must be properly supported
- Historically, DoD utilities are under programmed and under funded due to competing requirements
- DoD needs industry's best practices, innovations, financing and economies of scale



# Defense Secretary Guidance

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- Privatize all utility systems, unless
  - Security concerns preclude privatization
  - Cannot achieve economic benefit
    - Understand lack of response
    - Understand barriers to economic deals
- Promote competition
- Apply consistent economic analysis
  - Support sound decisions



## OSD Program Objectives Remain

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- Upgrade utility infrastructure to industry standards
- Capitalize upon industry economies of scale, efficiencies, and best business practices
- Privatization is the preferred tool for providing utility service at industry standards



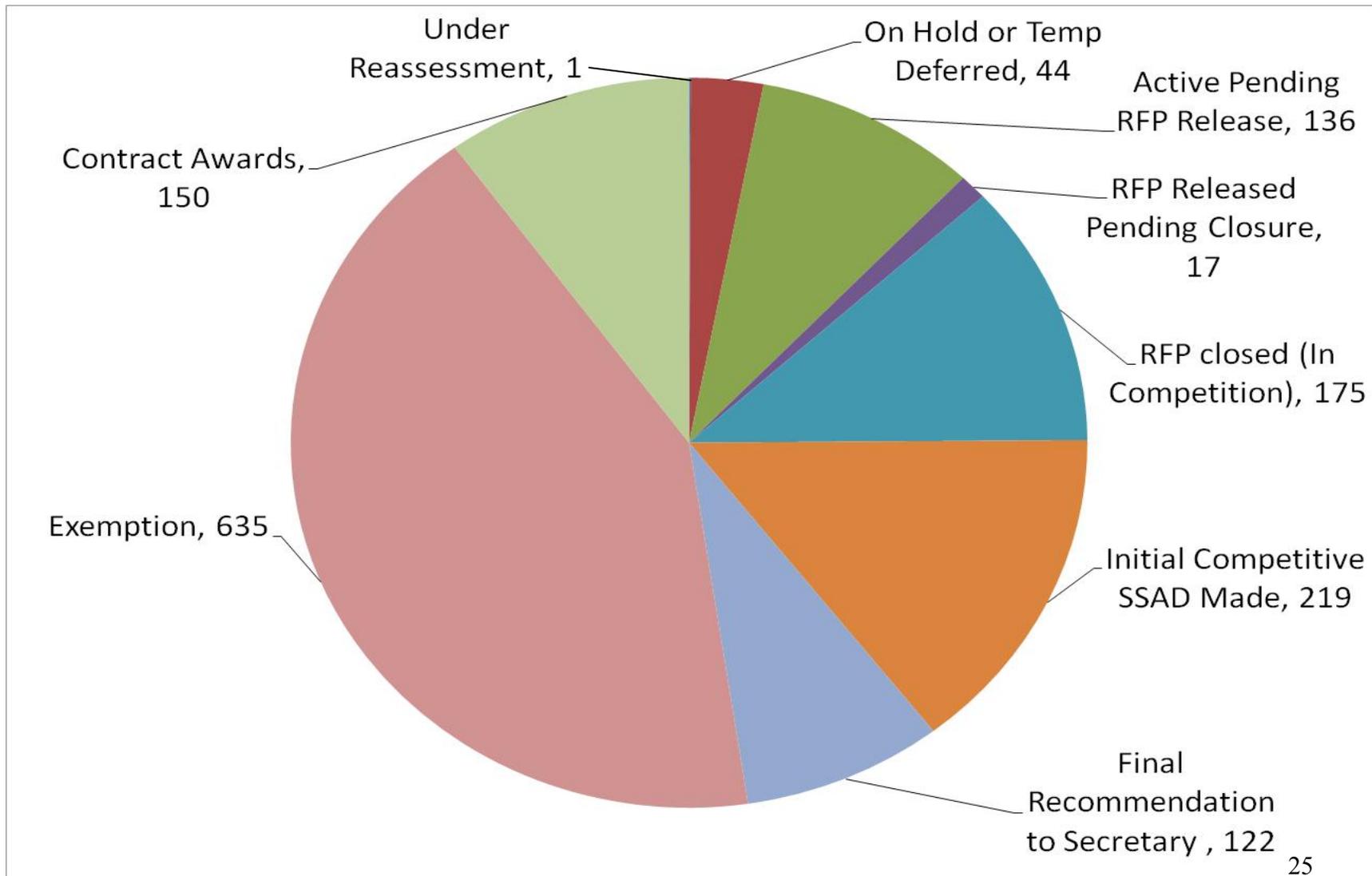
# Partnering With Industry

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- We are removing Roadblocks to Success by:
  - Easing your compliance burdens – FAR 31 Waiver
  - Extending the Program – Anticipated completion in FY2013-15
    - Initially tried to do too much, too fast
  - Aligning budget to facilitate privatization
    - Each Service revising completion plan/schedule which will require out year budget alignment
  - Learning from the past to prepare for the future
    - Staffing additional Contracting Resources



# DoD Utilities Privatization Status (Jan 08)





## UP Summary

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- OSD Program Objectives remain unchanged
- Completion schedule will be stretched out to at least 2013-15.
  - Budget alignment required
- Effective communication will ensure win-win partnerships



# Current OSD Focus

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- **Metering and Commercial Benchmarks**
- **Strategic Investment Plan**
  - Priorities for funding matched with best opportunities
  - ECIP \$70M 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)
- **Complete utilities privatization program**
- **Comprehensive approach**
  - Mobility/transportation energy
  - Sustainable Design Templates
- **Partnership with DoE on Net Zero, Financing, & Techval**



# Common Issues

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- Misaligned Incentives
  - Savings not retained by installation commanders for energy/fuel efficiencies achieved
  - Procurement and utilities paid for from different accounts
  - Working with Comptroller to allow retention of utility rebates
- Absence of Activity-based Costing
  - Fully-burdened costs do not drive all economic decisions
  - DoDI 4170.11 and Service policies require LEED Silver
- First cost versus life cycle
  - Budget process tends to focus on front end costs and may drive poor life cycle decisions
  - DoDI 4170.11 and Service policies require LEED Silver



# Assessment

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- Facility energy program established and on track
  - Always room for improvement
  - New challenges in EISA (fossil fuel reductions)
- Non-tactical vehicle program being worked
  - Opportunities for significant improvement
    - Joint base vehicle corridors
    - Aggressive petroleum substitution/reduction policy
    - Partnerships with industry and state governments
    - Use of alternative fuel where commercially available
  - Success will be reliant upon:
    - Integrated alternative fuel and vehicle procurement strategy
    - Investment in alternative fuels, alternative fuel vehicles, and supporting infrastructure



## DSB Feb 2008

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- Defense Science Board Report (facilities items)
  - Reduce risk to critical missions at fixed installations from loss of commercial power and other critical national infrastructure
    - Assess risk
    - “island”
    - Comprehensive renewable energy assessment and roadmap
    - 50% ↑ ASHREA by 2009
    - Meter all facilities by 2010
    - All MILCON net zero by 2020
    - All installations net zero by 2025
  - Senior energy official responsible for development of policies and procedures and oversight of their implementation



# Final thoughts

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- ODUSD Energy website:  
<http://www.acq.osd.mil/ie/irm/Energy/energy.shtml>
- Questions
- Contact me at:
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  - (703) 571-9074