OSD Facilities Energy

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Key Points

- DoD’s effort to reduce its high level of energy consumption is driven by mission considerations
  - Energy dependence is a threat to our effectiveness as warfighters (“threat multiplier”)

- As a technology leader, DoD is well-positioned to be a “solutions multiplier” in our country’s energy revolution
DoD Energy Costs, FY2010

Operational

Jet Fuel 81%

Aviation Gasoline 0%

Diesel-Distillate 4%

Auto Gasoline 2%

Other 1%

Navy Special 12%

Facilities

Facilities Energy * $4.01B (26%)

Operational Energy $11.18B * (74%)

* FY09: $9.34B Fuel consumption was 9% less in FY10 than in FY09 but costs increased by 19.7%.

$4.01B in facilities energy costs include non-tactical vehicle fuel.

$3.76B - facilities energy

$0.25B - non-tactical vehicle fuel

DoD Energy Costs

FY10: $15.2B

FY09: $13.4B

$4.01B in facilities energy costs include non-tactical vehicle fuel.

* FY09: $9.34B Fuel consumption was 9% less in FY10 than in FY09 but costs increased by 19.7%.

$3.76B - facilities energy

$0.25B - non-tactical vehicle fuel
• **539,000 Facilities** (buildings and structures)
  – 307,295 buildings
    • 2.2 billion square feet
• **Comparisons**
  – GSA: 1,500 government buildings
    • 176 million square feet
  – Wal-Mart US: 4,200 buildings
    • 687 million square feet
• **160,000 Fleet Vehicles**
Why Facilities Energy Matters

• **Significant Cost**
  - FY09: $4.0 billion (26% of total DoD energy costs)
  - Cost likely to increase (reduced presence in Iraq and Afghanistan, improved QoL)

• **Environmental Impact**
  - Contributes a disproportion share (~40%) of GHGs

• **Mission Assurance/Energy Security**
  - DoD’s reliance on a fragile commercial electricity grid places continuity of critical missions at serious and growing risk

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• **EPACT 2005**
  - Advanced Meters
  - Energy Efficient Procurement
  - Building Performance Standards
  - Renewable Consumption Goals
  - Energy Audits
  - Energy Manager requirements
  - Fossil fuel reductions in buildings
  - Petroleum consumption and alternative fuel goals

• **EISA 2007 and EP 13423**
  - Energy intensity reduction goals
  - Water use reduction goals

• **SecNav Goals**
In FY2010, DoD decreased total facility energy intensity by 11.4 percent compared to the FY2003 baseline, as shown in Figure 2.6. The Department did not, however, achieve the FY2010 goal of a 15 percent reduction in energy intensity.

Figure 2.6 DoD Energy Intensity Compared To EISA 2007 Goal*

In FY2010, the Army reduced energy intensity relative to its FY2003 baseline by 8.7 percent. This is a 1.5 percent improvement from the FY2009 energy intensity. In FY2010, the Army took organizational steps to increase senior leadership emphasis on energy management. The Army is investing in metering and data management, improving facilities energy designs, and growing its private industry partnership program.

In FY2010, although the Air Force was nearly on target with a 14.9 percent intensity reduction, its intensity is roughly the same as FY2009. To continue meeting its energy goals in the future, the Air Force remains committed to a robust energy management program. The Air Force will accelerate its use of private financing contracts and continue to support its existing program of conducting facility audits, hiring energy managers across the organization, and getting the most out of its existing facilities through retro-commissioning.

The Department of the Navy had an energy intensity reduction of 13.7 percent. The Navy plans to exceed the EISA 2007 energy intensity goal. The Secretary of the Navy directed the Navy and Marine Corps to reduce energy intensity by 50 percent by 2020. The Department of the Navy is aligning its leadership and resources to implement its plan, which includes a robust energy audit program and a commitment to fund cost-effective energy conservation opportunities. The Navy also seeks a major reduction in source energy consumption through cogeneration, which today accounts for about 6 percent of its total intensity goal attainment.

* DoD Components are accounted for in DoD trend line
Facilities Energy Strategy: Reduce Demand

New Construction

Acquisition, Technology and Logistics

Naval Station Great Lakes (LEED Gold)

United States Air Force Academy (Future LEED Platinum)

Fort Carson (LEED Gold)

Fort Belvoir (LEED Gold)
Facilities Energy Strategy: Reduce Demand

Retrofits

Acquisition, Technology and Logistics

Naval Base Coronado (Daylighting)

Ramstein AFB (Daylighting)

EMCS Upgrades

NSWC Corona (Energy Retrofits)

Dam Neck Geothermal
Facilities Energy Strategy: Increase Supply

Nellis AFB

Solar PV on Parking (Various)

Tooele Army Depot

Joint Expeditionary Base Little Creek

Fort Carson

**Microgrid (conceptual)**

**Renewable/On-site Integration**

- **PV farm**
- **PV shading**

**US Electric Grid**

**Interconnected grid**

- **High voltage transformers**

**Cogeneration Plant**

**Management, Storage, & Integration**

**Substation**
Facilities Energy Strategy: Electric Vehicles

Acquisition, Technology and Logistics
OSD Energy Programs and Influence

- Policy
  - Metering Policy
  - DoD Instruction 4170.11
- Smart Installations
- Enterprise Energy Information Management (EEIM)
- 3rd Party Financing
- ECIP
- Budget Exhibits
- Energy Clearinghouse
- Test Bed
- GovEnergy
Energy Test Bed – ESTCP Program

Continuous Commissioning

Grid Parity Solar Power

Smartgrid

Advanced Lighting Controls

BIPV Roofs

Low BTU Landfill Gas Microturbine

Figure 1. Block diagram of the proposed Advanced Building Energy Management Systems
What is GovEnergy

• The premier energy workshop and tradeshow for federal employees
• Networking and educational opportunities abound
• 7 Federal co-sponsors
• 2011 Stats
  – 15 Technical Tracks, 135 Sessions, over 300 Speakers
  – Registrations
    • 4103 Total
    • 1367 Federal
    • 832 Non-Federal
    • 1358 Exhibitors
• 2012 GovEnergy in St. Louis 19-22 August 2012
Federal Attendance by Agency

Total Federal Attendance: 1,367
Non-Federal Attendance by Organization Type

- Consultant: 19%
- Government Contractor: 21%
- Energy Service Company (ESCO): 13%
- Building/Contractor / Developer: 10%
- Architect/Engineering Design: 9%
- Other: 8%
- Utility: 6%
- Equipment Supplier/Installer: 7%
- Financial Institution: 2%
- National Laboratory: 2%
- Research & Development: 2%
- State and Local Government: 1%

Total Non-Federal Attendance: 873
GovEnergy Tracks (Notional)

- Technologies
- Policy, Planning & Leadership
- Complying with Federal Directives
- Contracting and Finance
- Energy 101
- Energy 501
- Building O&M
- Utility

- GovEnergy Roundtable
- Building Energy Management
- Attitudes, Behavior & Culture
- Energy Security
- Renewables
- Water
- Specialty Buildings
GovEnergy: NPS Role?

- NPS research can help add to the conversation
  - Energy / Energy Security research
  - New Energy Graduate Degree Program
- Information gap between NPS research and DoD Energy practitioners
- Presentation Opportunities
  - Discuss results/implications of ongoing/recent research
    - Traditional Session or Poster Presentation
  - Marketing opportunity for Energy Degree program
  - Variety of “conversation” opportunities in GovEnergy Roundtable
    - Creating facilities energy research agenda
    - Network of Government University energy clubs
  - Teaching opportunities in leadership, policy, attitudes, behavior and culture
  - Opportunities outside traditional GovEnergy session format