



# DoD Installation Energy



# Installation Energy Issue

Acquisition, Technology and Logistics

- DoD Spent \$4.0B On Installation Energy In FY2008
  - Facilities account for 25% of total DoD energy costs in 2008
  - Major source of GHG
  - Price increase and volatility strain installations
- DoD Installations At Risk Due to Reliance On The Grid
- Energy & Greenhouse Gas Emissions Reductions
  - Federal policies and regulations
  - Carbon constraints will add to cost of energy

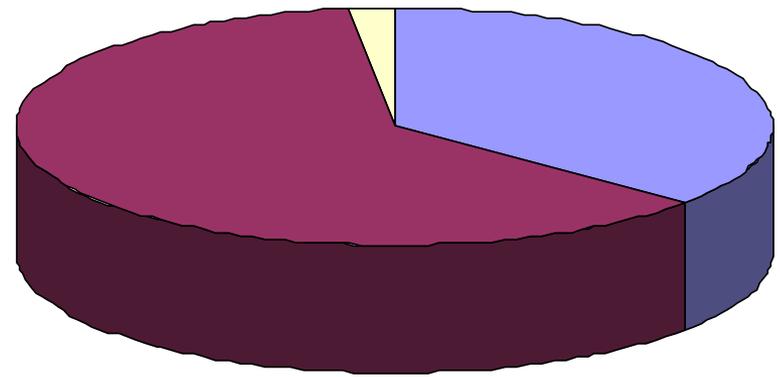


# DoD Energy Use

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- \$20B direct costs in 2008
  - \$16B fuel
    - Current optempo high
    - Fuel price high
  - \$4B facilities
    - 64% electricity purchases
- Energy GHG Emission
  - 73.5 million MT CO<sub>2</sub>eq in 2008
    - 1.3% of US emissions
    - Would be in top 40 countries

## GHG (CO<sub>2</sub>eq)



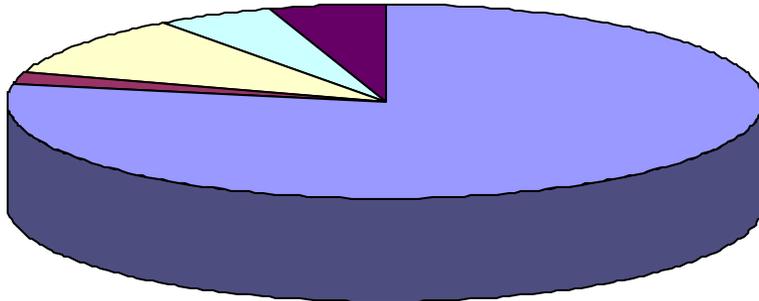
- Facility (36%)
- mobility & generators (62%)
- fleet fuel: non-tactical (2%)



# Army Greenhouse Gas Emissions

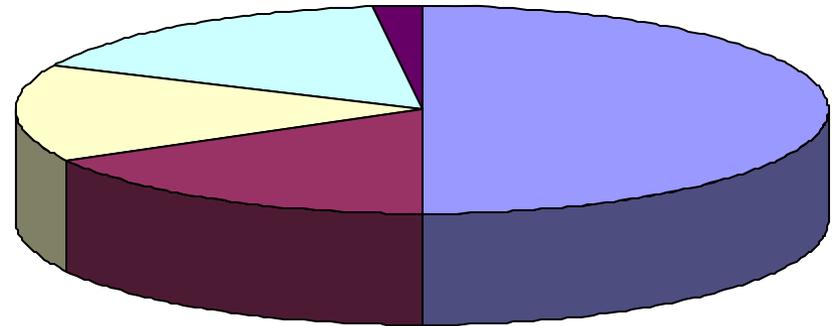
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## Future footprint? (CO<sub>2e</sub>)



- Facilities (77%)
- Generators (2%)
- Combat Aircraft (10%)
- Tactical Vehicles (5%)
- Non-tactical Vehicles (5%)

## Current Optempo (CO<sub>2e</sub>)



- Facilities (50%)
- Generators (17%)
- Combat Aircraft (15%)
- Tactical Vehicles (16%)
- Non-tactical Vehicles (2%)

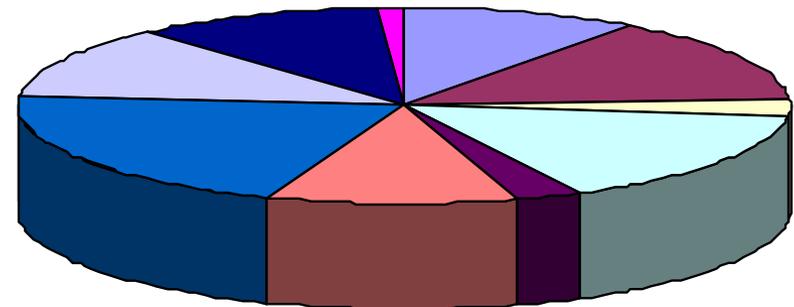


# DoD Built Infrastructure

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- 545,700 Facilities (buildings, structures, linear structures)
  - 316,200 buildings
    - 2.2 B sq ft
- Comparisons
  - GSA: 1513 government buildings
    - 176 M sq ft
  - Walmart US: 4200 buildings
    - 687 M sq ft

## DoD Building Stock



	Operation & Testing (10%)
	Maintenance & Production (14%)
	RDT&E (3%)
	Supply (16%)
	Hospital & Medical (3%)
	Administrative (11%)
	Family Housing (20%)
	Troop Housing & Mess (12%)



# Current Practice

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- Little DoD R&D Directed Toward Installations
- Exploitation and Leveraging of DOE Investments Uncoordinated and Limited
- Current Practices Sub-optimal In All Phases
  - Design, build, commission, and operate
  - Current reduction in energy usage outpaced by increase in energy costs
    - Air Force reduced energy usage by 11% but costs increased by 49% (2001 to 2007)
- Technology Procured Through Alternative Financing Mechanisms: ESPC and UESC
  - Barrier to exploiting innovation



# Installation Energy Initiative

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- Use DoD Facilities As Test Bed For Innovative Energy Technologies
  - Validate performance, cost, and environmental impacts
  - Directly reach out to private sector for innovations
  - Partner with DOE
- Test & Evaluate For All DoD Facilities
  - Energy Conservation & Efficiency
  - Renewable and Distributed Energy Generation
  - Control & Management of Energy Resources & Loads
- Stimulate Increased Investments at DoD Facilities (ESPC)
- Transform Milcon Design Practices



# DoD Benefits

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- **Decreased Costs and Increased Security**
  - Reduced energy demand in existing buildings ~50%
  - Reduced energy demand in new buildings ~80%
    - Through systems design, modeling & monitoring coupled to energy efficient components
  - Increased energy efficiency and power quality
    - Distributed energy resources (DER)
    - Micro-grid management
  - Increased fuel diversity & reduced price volatility
    - DER and renewables
  - Increased security
    - Local power generation & reduced demand
    - Islanding through Micro-grid management
- **Reduced Carbon Footprint**



# Opportunity for Partnerships

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Acquisition, Technology and Logistics

- DoD infrastructure is unique in the Federal government
  - mirrors the nation's
- DoD has a culture of test and evaluation
  - Direct tie to customer
- Opportunity for real world testing
  - Installations are communities
- DoD is a significant market
  - Early transition opportunities