



AMERICA'S ARMY:

THE STRENGTH OF THE NATION

Army Energy & Sustainability Program Overview

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IMCOM Energy and Environment – Sustainability Video

<http://www.dvidshub.net/video/114836/energy-and-environment-sustainability-video>



“Now, there are costs associated with this transition. And there are some who believe that we can't afford to pay those costs right now. I say we can't afford not to change how we produce and use energy – because in the long-term costs to our economy, our national security and our environment are far greater.” - President Obama, Jun 2010



“We're telling America's scientists and engineers that if they assemble teams of the best minds in their fields, and focus on the hardest problems in clean energy, we'll fund the Apollo projects of our time.” - President Obama, State of the Union Address, Jan 2011



“The Army has developed a comprehensive energy security strategy, and is acting now to implement initiatives to make us less dependent on foreign sources of fuel and better stewards of our nation's energy resources.”

- CSA, SA Testimony to the Senate Appropriations Defense Subcommittee, March 2010

“...[T]he Army is actively supporting partnerships and private industry investments in clean energy technologies such as large-scale solar, wind and geothermal power sources to reduce our dependence on a single source of power.”

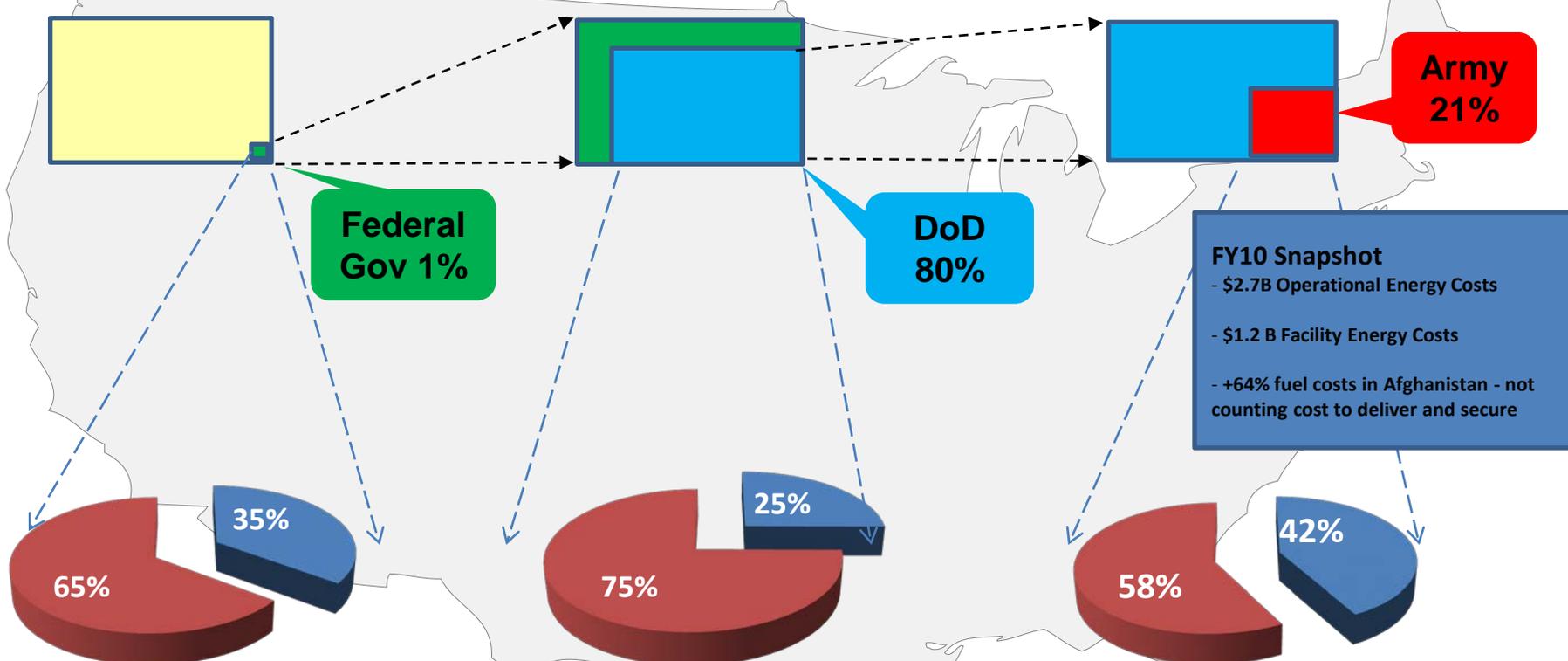
- SMA, CSA, SA, Army Energy Awareness Month Letter, Oct 2010



United States

Federal Government

Department of Defense



■ Facilities
■ Vehicles & Equipment (Tactical and Non-tactical)

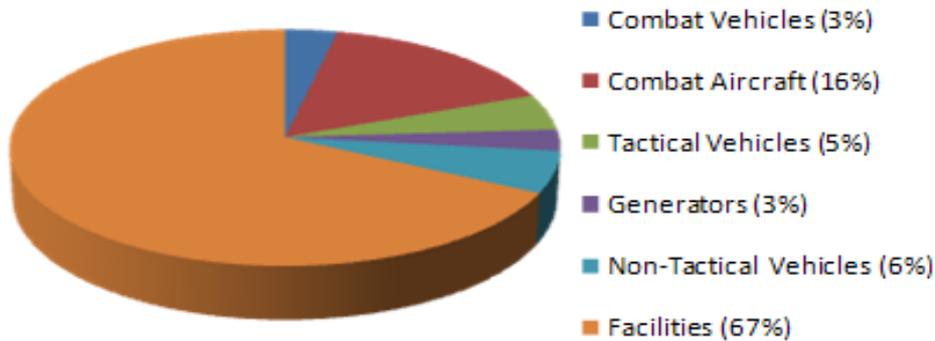
U.S. = 94,578 Trillion Btu **DoD = 880 Trillion Btu**
Fed Gov = 1,096 Trillion Btu **U.S. Army = 190 Trillion Btu**

Sources: Energy Information Agency, 2009 Annual Energy Review; Agency Annual Energy Management Data Reports submitted to DOE's Federal Energy Management Program (Preliminary FY 2009)

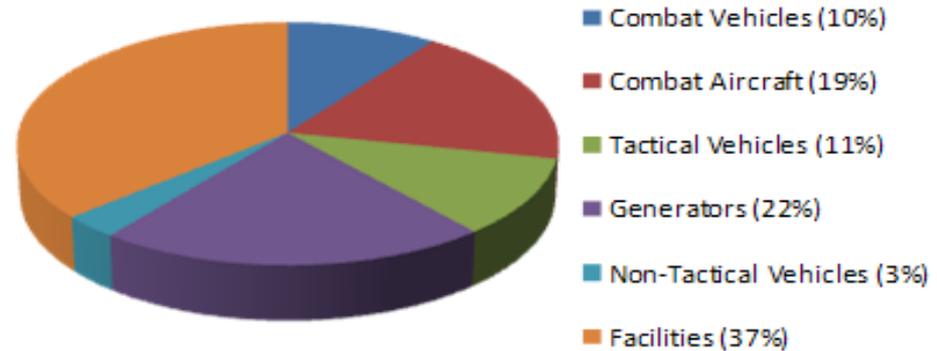


Army Energy Requirements are Driven by Mission Requirements

Peacetime



Contingency Operations



Army Force Moves

Present
Current Army
Force Structure



Future

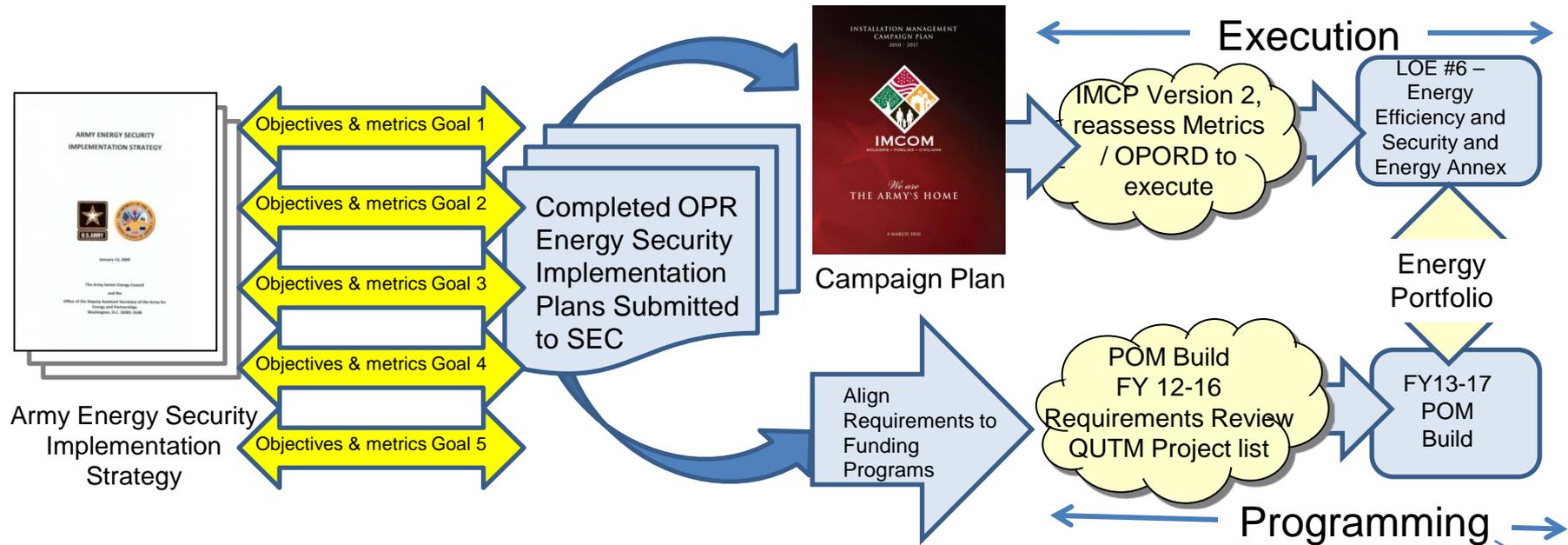
- Expanding/closing bases
- Bringing soldiers home
- Additional training for the Guard and Reserve

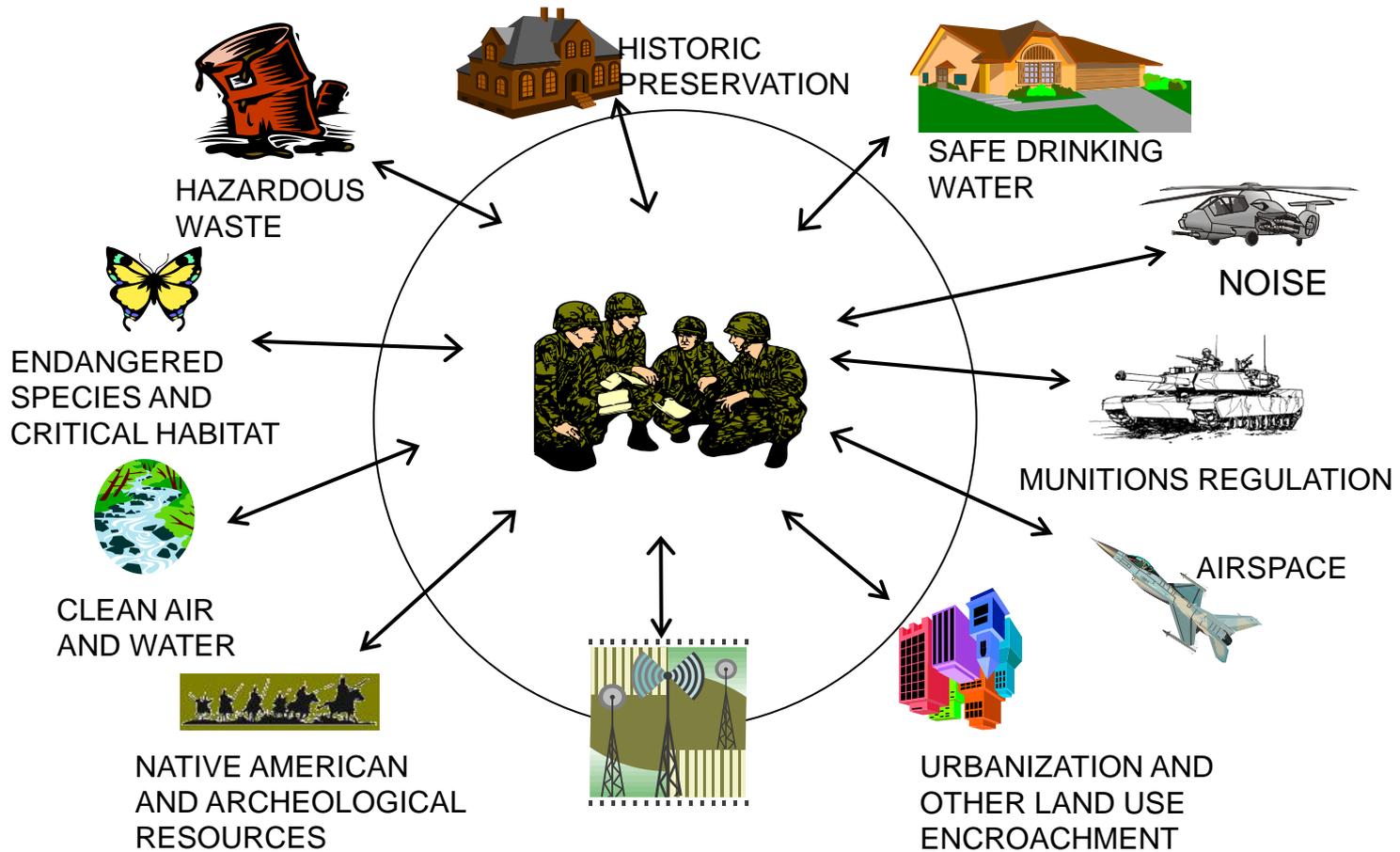


Energy Security Goals

- 1.Reduced energy consumption
- 2.Increased energy efficiency across platforms & facilities
- 3.Increased use of renewable/alternative energy
- 4.Assured access to sufficient energy supplies
- 5.Reduced adverse impacts on the environment

Statutes,
Executive
Orders,
Committee
Reports,
Rules,
DOE/OMB/
CEQ
Directives

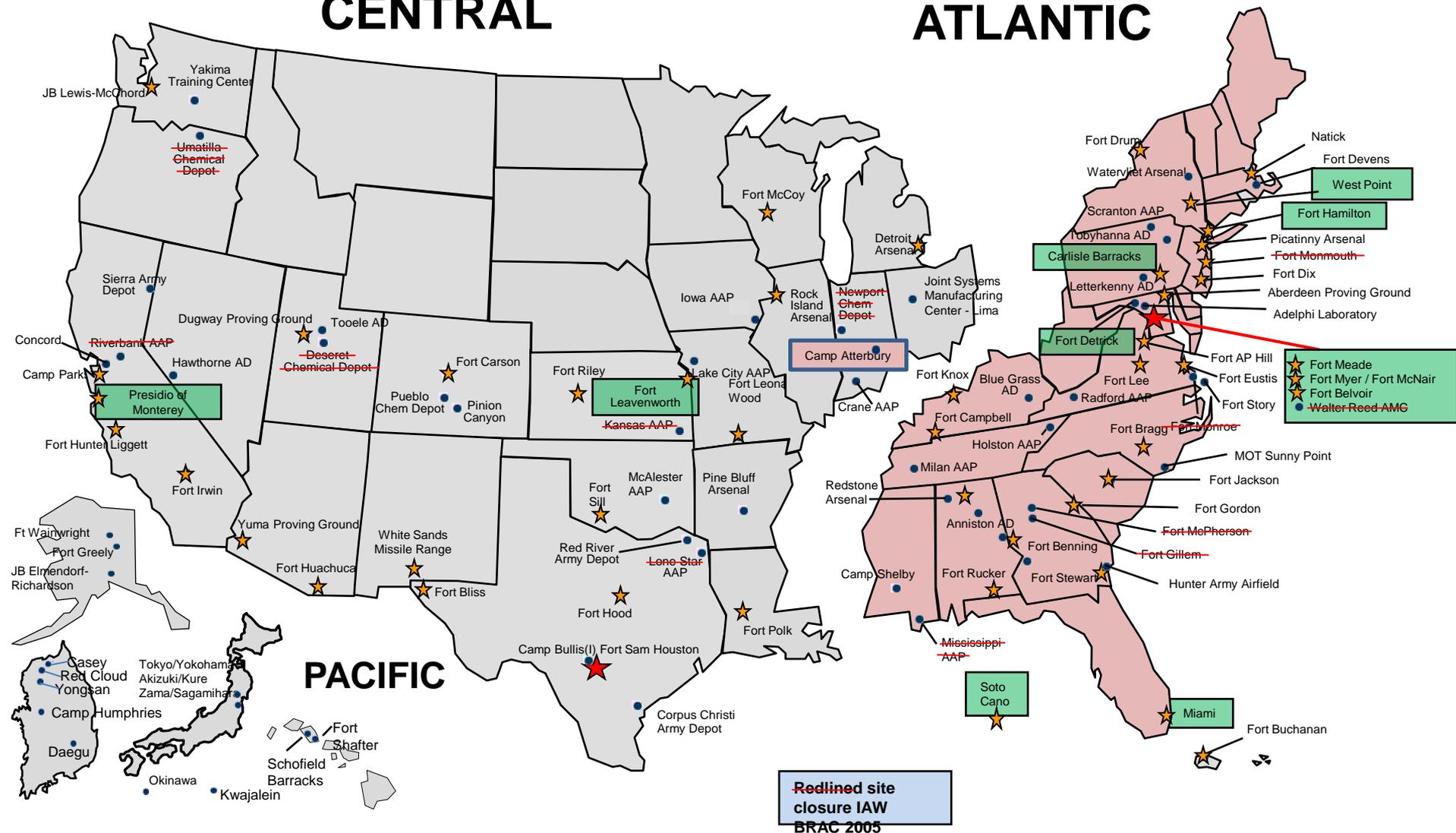


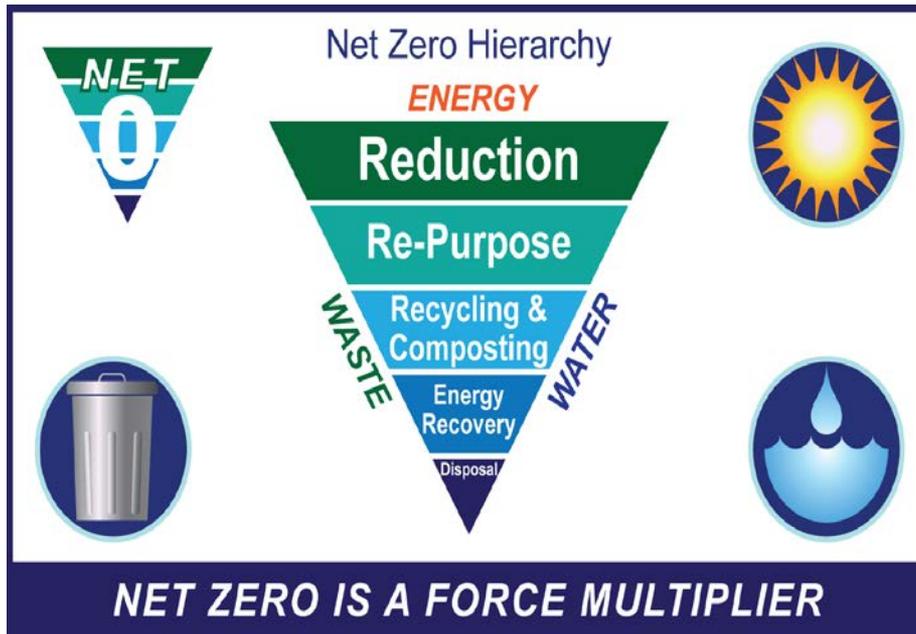


ACTIVE ARMY INSTALLATIONS

CENTRAL

ATLANTIC

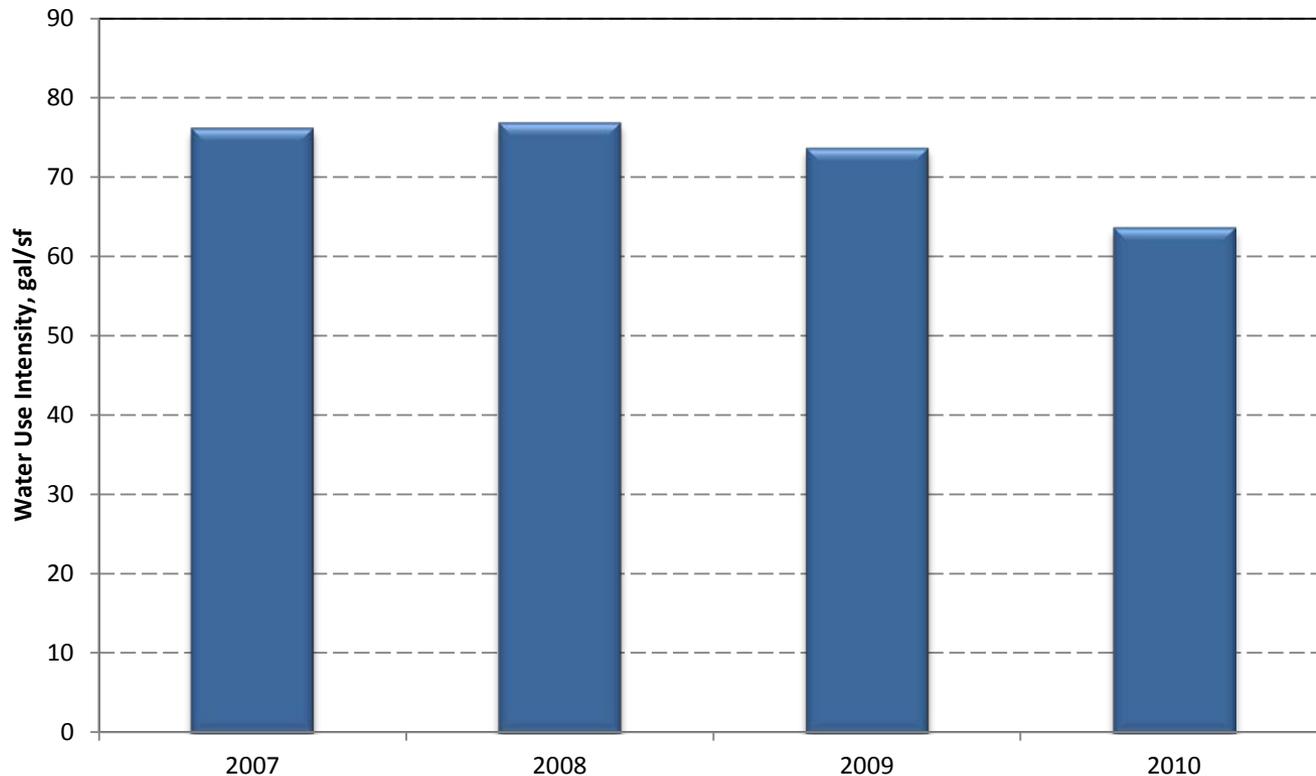


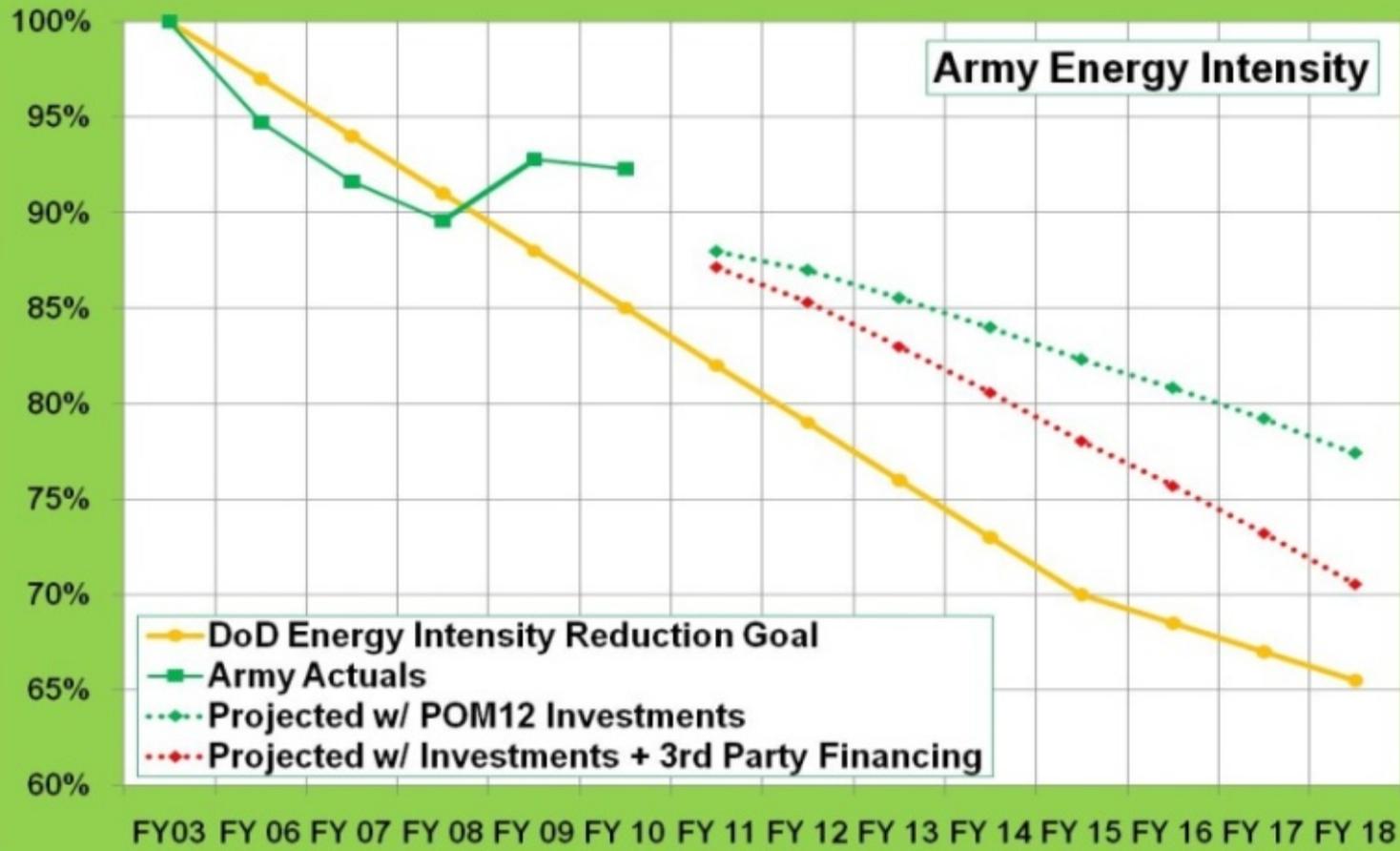


- **A Net Zero ENERGY Installation** produces as much energy on site as it uses, over the course of a year.
- **A Net Zero WATER Installation** limits the consumption of freshwater resources and returns water back to the same watershed so not to deplete the groundwater and surface water resources of that region in quantity or quality.
- **A Net Zero WASTE Installation** reduces, reuses, and recovers waste streams, converting them to resource values with zero landfill.
- **A Net ZERO INSTALLATION** applies an integrated approach to management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air.



FY07-10: 20% reduction in potable water consumption





2010 Key Army Performance Metrics OMB Scorecard:

- Energy Intensity
Achieved **-8.7%**
Goal -15.0%
- Renewable Energy
Achieved **2%**
Goal 5%
- Water Use
Achieved **-15.3%**
Goal: -6.0%
- Petroleum Reduction
Achieved **-2.2%**
Goal -10.0%

Army continues to address energy efficiency, renewable energy generation, and alternative fuel sources but remains challenged by engagement in the full spectrum of persistent war, global deployment and repositioning, BRAC, intense training regimen, and Soldier-Family support to sustain the volunteer force.



● Utilization of Efficient Lighting Policy (Oct 2010)

- The Army will phase out purchases of incandescent light bulbs
- Implements Energy Independence and Security Act (EISA) of 2007 efficiency standards for manufacturers to improve the performance of lamps intended for general service applications

● Sustainable Design & Development Policy (updated Oct 2010)

- Policy update addresses the Army approach to the design and development of efficient military construction projects and major renovations by incorporating guidance in ASHRAE 189.1 as the baseline standard.

● Building Efficiency Tax Deduction Policy (Dec 2010)

- Policy will assist Army contractors to validate and obtain tax incentives and deduction for costs of installing certain energy efficient systems in government buildings
 - Contractors can qualify for tax deductions of up to \$1.80 per square foot.
 - Building envelope, HVAC and Hot Water Systems, and lighting can each qualify for 1/3 of the deduction
- The tax incentives were authorized in the 2005 Energy Policy Act and enacted by the IRS as Section 179D



IMCOM Energy and Water Management Programs

Energy Conservation

- Appoint, in writing, full time garrison energy managers (1 person per 5M SF)
- Include energy and water conservation responsibilities in position descriptions of Commanders and Directors and other key positions
- Establish and chair a quarterly Garrison Energy Steering Committee
- Implement a Building Energy Monitor and Unit Energy Conservation Officer Program

Energy Efficiency

- Implement low cost/no-cost energy and water conservation measures
- Identify and implement projects with paybacks of less than 10 years
- Review all new construction and repair project plans for energy and water efficiency
- Starting with the 2008 MILCON Program, all new construction & major repair & renovation must incorporate sustainable design principles to achieve a minimum of the LEED Silver Certification
- Annually perform Comprehensive Energy and Water Evaluations (energy audits) of at least 25% of their facilities

Alternative and Renewable Fuels

- Reduce vehicle fleet petroleum use 30% by 2020



REQUIREMENTS

RESOURCES



Army Energy Initiatives Task Force – seek \$7.1B of private financing over next 10 years





Leveraging private sector investments is a strategy to advance efficiencies in an era of constrained resources.

Authorities from Congress:

- **Energy Savings Performance Contracts (ESPC)** – Implementation and financing of energy efficiency projects out of energy cost savings
- **Utility Energy Service Contracts (UESC)** – Service contract with utility provider
- **Enhanced Use Lease (EUL)** – Use of non-excess Army land exchanged for In-kind SRM projects
- **Power Purchase Agreement (PPA)** – Energy projects installed on installations at no-cost in exchange for long term agreements to purchase renewable energy

Other Authorities:

- Residential Community Initiative (RCI) – privatized housing
- Privatized Army Lodging (PAL)
- Utility Privatization (UP)



Replace Boilers with high efficiency models
Picatinny Arsenal, NJ



**Tooele Army
Depot, UT
Wind Turbine**



Fort Drum, NY - Solar Walls And Energy Improvements:



**Sea Girt New Jersey National Guard Training Center -
Photovoltaic Solar Electric Power System cover over
POV parking area**



FY09 NDAA Definition:

“The energy required for training, moving, and sustaining military forces and weapons platforms for military operations. The term includes energy used by tactical power systems and generators and weapons platforms.”



CHALLENGE: Liquid Fuels + Generators = Energy on today's battlefield



Challenges

Fuel & water comprise
70-80% of ground
resupply by weight...

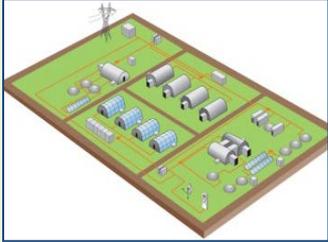
...and 1 casualty occurs
for 24 ground resupply
convoys in OEF



**Piloting Solutions in
Permanent Installations**
Increase Efficiency
Demand Management
Diversifying Supply

Potential Solutions

Smart and Green Energy (SAGE) for Base Camps



- Smart Micro-grids
- Renewable Energy
- Purpose-built Shelters
- Efficient Generators
- Onsite Water

Portable Solar Power



Tactical Fuels Manager Defense



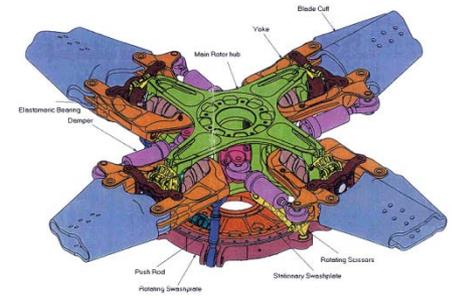
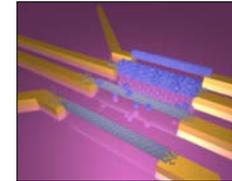
Portable Power Capabilities





Energy and Power - *Reduce Fossil Fuel and Battery Demand*

- Reduce platform energy consumption
- More efficient power sources
- Smart energy management
- Proactive thermal management
- Provide energy options (e.g., alternative fuels, solar)



Logistics - *Reduced Fully Burdened Cost of Logistics*

- Reduce fuel and water battlefield delivery
- Develop efficient turbine, hybrid engines and propulsion systems
- Comprehensive condition-based maintenance
- Pursue lightweight materials technologies (e.g., composites, lightweight track)
- Improve precision delivery of Soldiers/equipment (e.g., air drop)



Collaborate With the Department of Energy on Research



Energy Security – *“assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs”* (QDR)

Our Soldiers Deserve Nothing Less!