OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS & ENVIRONMENT)

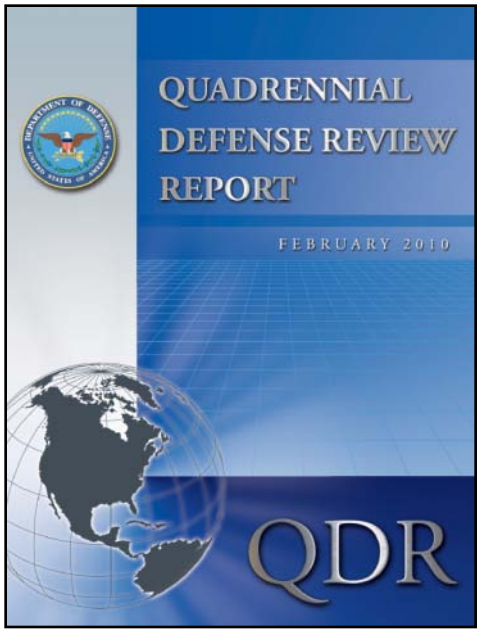
ARMY ENERGY SECURITY

SURETY SUPPLY SUFFICIENCY SURVIVABILITY SUSTAINABILITY

GovEnergy
16 August 2010

Dr. Kevin Geiss
Program Director, Energy Security
Office of the Assistant Secretary of the Army for
Installation & Environment

Quadrennial Defense Review
February 2010



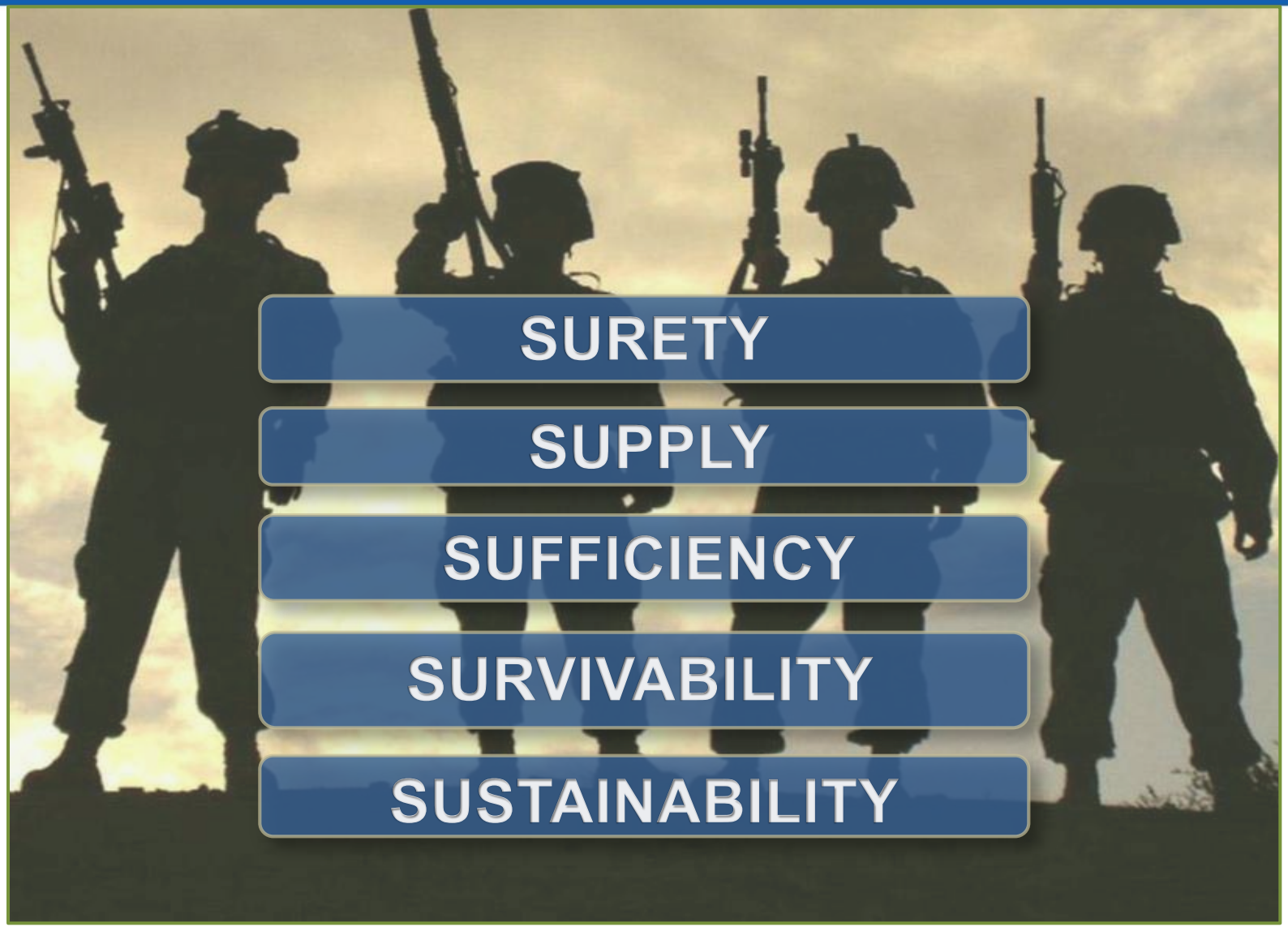
Energy Security – "*assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs*" *– pg 87*

- DoD will
  - promote investments in energy efficiency
  - ensure that critical installations are adequately prepared for prolonged outages caused by natural disasters, accidents, or attacks
- Balance energy production and transmission to preserve test and training ranges and operating areas needed to maintain readiness

"**Energy efficiency** *can serve as a force multiplier, because it increases the range and endurance of forces in the field and can reduce the number of combat forces diverted to protect energy supply lines…" – pg 87*

QDR energy security discussion is consistent with Army approach and priorities

ENERGY SECURITY



Leadership Supports Energy Initiatives

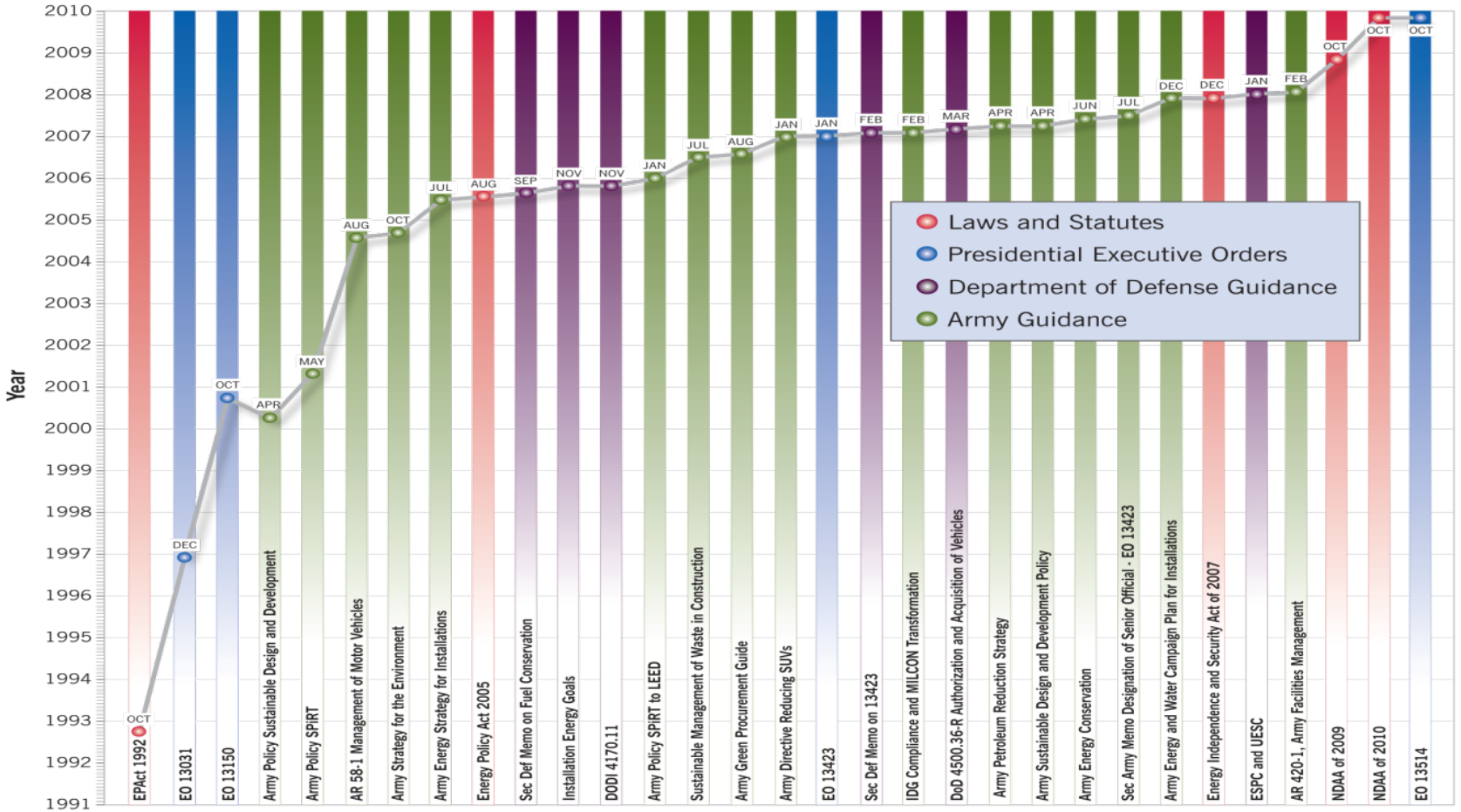
"Now, there are costs associated with this transition. And there are some who believe that we can't afford to pay those costs right now. I say we can't afford not to change how we produce and use energy – because in the long-term costs to our economy, our national security and our environment are far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

"We're making our government's largest ever investment in renewable energy – an investment aimed at doubling the generating capacity from wind and other renewable[s]..."
- President Obama, Sep 2009

"The Army is making dramatic strides in reducing our energy consumption. Fort Irwin is a great example… The Army would like to see every base have a back-up means of establishing their energy independence."
- John McHugh, Secretary, U. S. Army, Nov 2009

"…[T]he Army is actively supporting advanced technologies and increases in energy efficiencies at our installations, in our weapon systems, and in operations." - SMA, CSA, SA, Army Energy Awareness Month Letter, Oct 2009

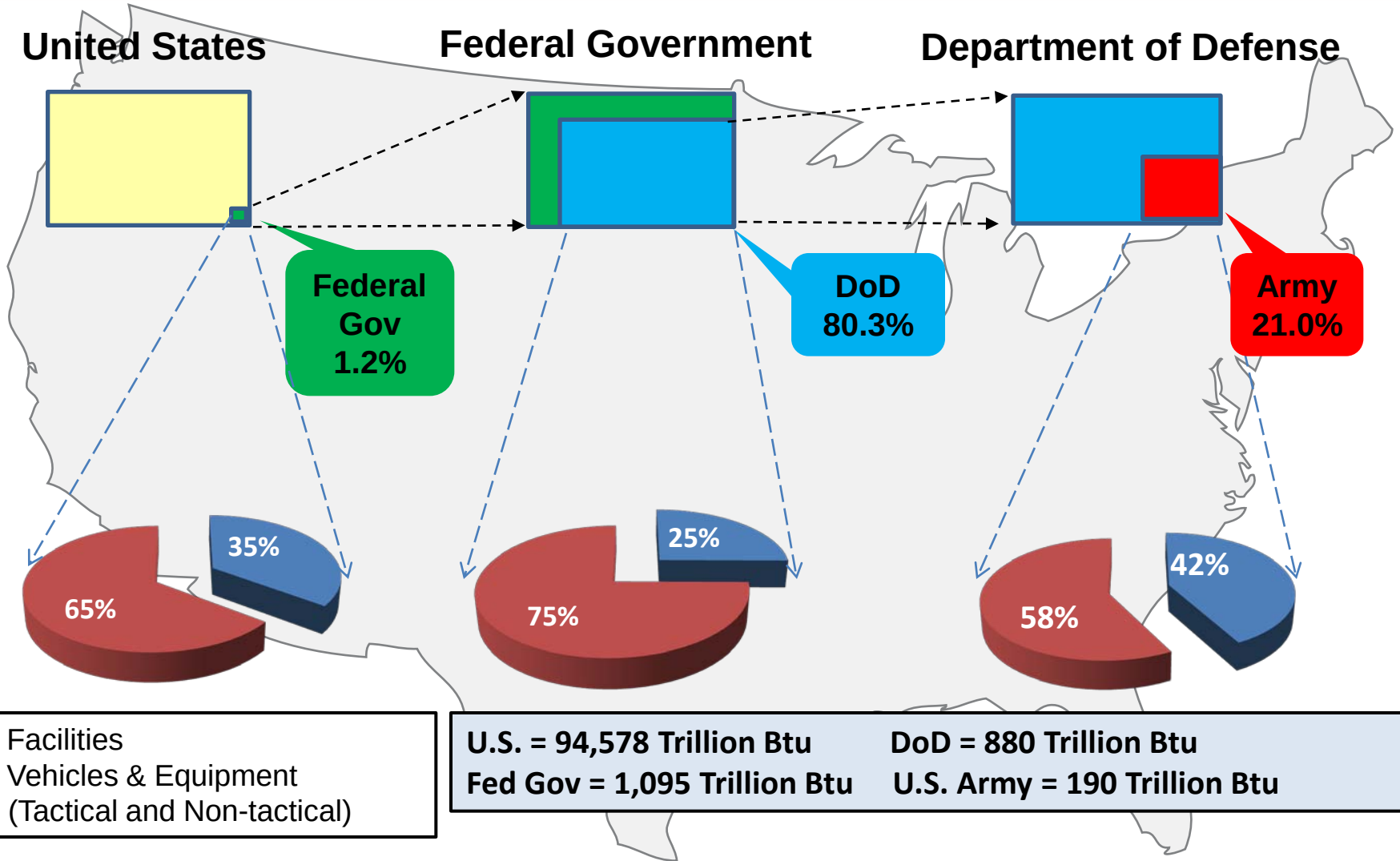
Key Energy Directives
Challenge and Opportunity



H.R. 5026 - To amend the Federal Power Act to protect the bulk-power system and electric infrastructure critical to the defense of the United States against cybersecurity and other threats and vulnerabilities, with an amendment in the nature of a substitute"

- Senate Energy and Natural Resources Cmte, 5 Aug 10

U.S. Army Energy Consumption, 2009



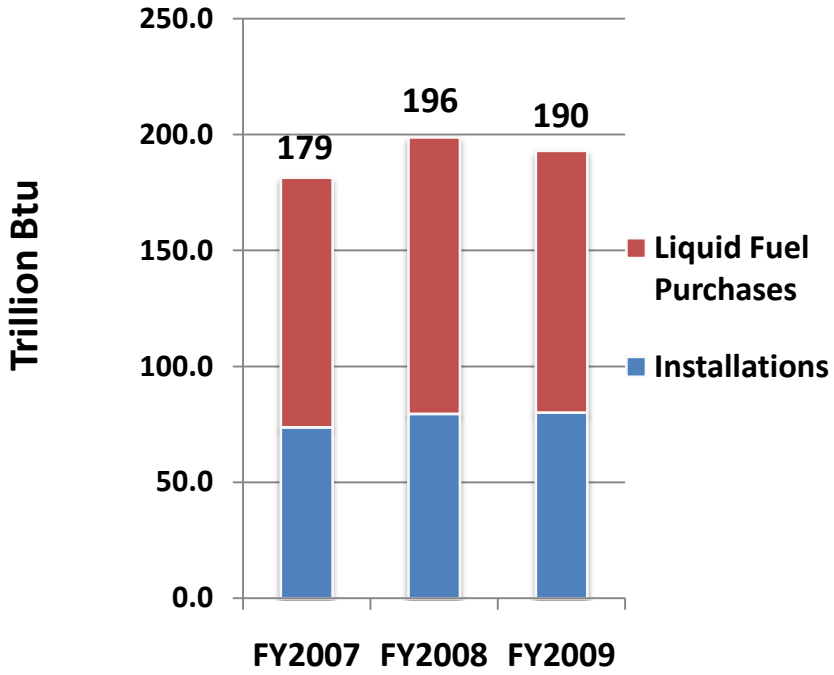
- Facilities
- Vehicles & Equipment (Tactical and Non-tactical)

U.S. = 94,578 Trillion Btu **DoD = 880 Trillion Btu**
Fed Gov = 1,095 Trillion Btu **U.S. Army = 190 Trillion Btu**

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

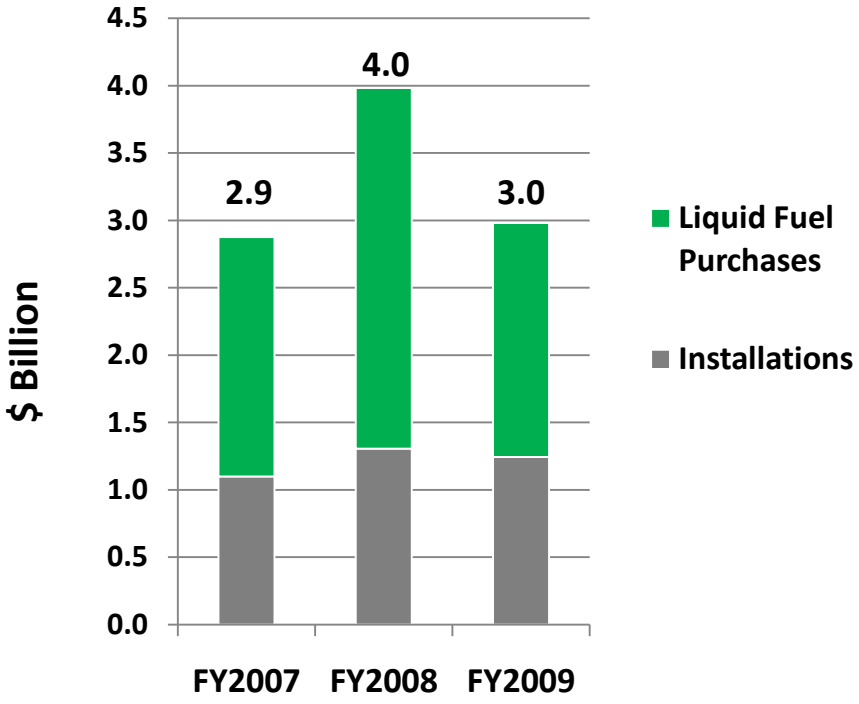
ARMY ENERGY CONSUMPTION & COST

Consumption & Fuel Purchases



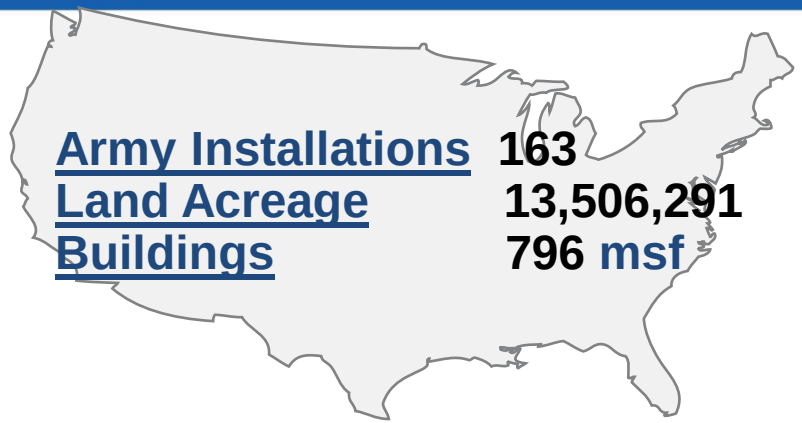
FY 2008 – FY 2009 Trillion Btu Decrease = 3%

Cost



FY 2008 – FY 2009 Cost Decrease = 25%

Renewable Energy Project Potential



Army Installations	163
Land Acreage	13,506,291
Buildings	796 msf

U.S. Army in 2009:
Overall Energy Consumption = 190 Trillion Btu
Energy Costs = $3 Billion
66 Renewable Energy Projects Operating
Renewable Energy Generation = 363 Million Btu

Currently Prioritizing Installations for Renewable Energy Development based on:

- Resource potential
- State regulations
- Federal and State incentives
- Payback periods and levelized cost of electricity
- Regulatory considerations

Top States for Renewable Energy Development: CA, NV, NM, WA

Our Strategy Depends on Partnerships!

"A number of Army installations…have significant potential for development of alternative and renewable energy programs. Providing access for industry to such opportunities "inside the fence" is a factor that the Army can take advantage of to build these partnerships."
(Army Energy Security Implementation Strategy)

Army's Partners in Identifying Renewable Opportunities

Pacific Northwest NATIONAL LABORATORY
Booz | Allen | Hamilton
U.S. DEPARTMENT OF ENERGY
LMI
NREL National Renewable Energy Laboratory

Example Energy Security Projects & Funding Source

BLACK: Existing System
BLUE: Planned Project
RED: Development or Testing Project

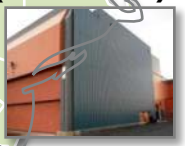
Hawthorne Army Depot, NV
(Geothermal Power)

Tooele AD, UT
(Wind Power)

Fort Carson, CO
(Solar PV Array)

Fort Knox, KY
(Ground Source Heat Pumps, Shale Gas)

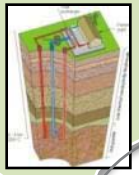
Fort Drum, NY
(Solar Wall)



Fort Irwin, CA
(Solar Power)

Fort Huachuca, AZ
(Rooftop PV)

Fort Bliss, TX
(Geothermal Well Tests)



Fort Sill, OK
(Micro-grid Field Demo)

Fort Bragg, NC
(LEED Platinum)

Fort Jackson, SC
(Fuel Cells)

Renewable Energy
2009 Summary

TOTAL PROJECTS – 66
363 Million Btu = Renewable Energy Generation
(23.8 GWH = Renewable Electricity)

FORT BLISS

Unique Opportunity

Fort Bliss Renewables:

Unique Opportunity

- Geothermal
- Solar Thermal
- Solar Day Lighting
- Solar PV
- Wind
- Biomass

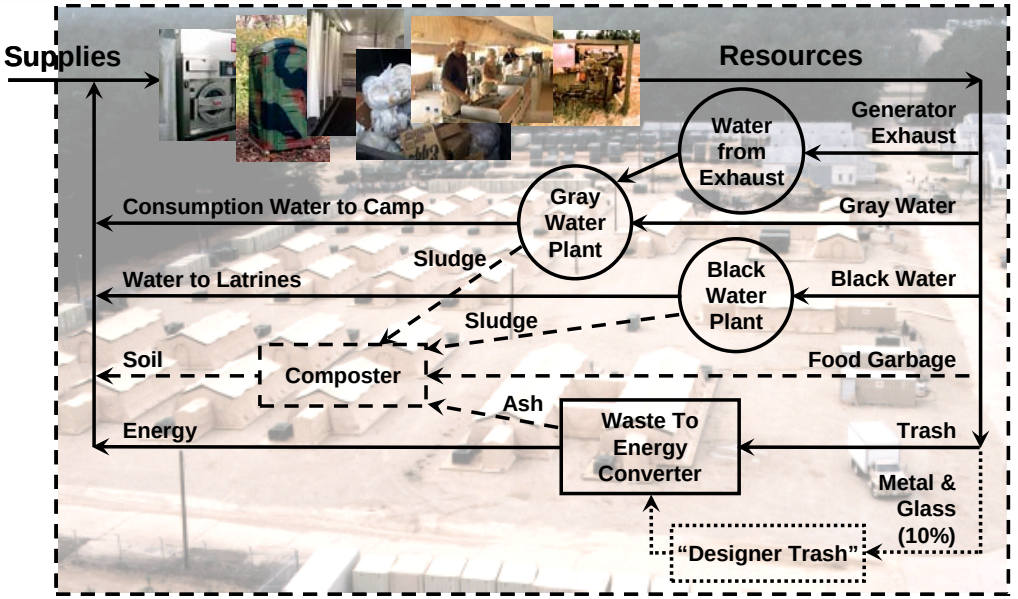
330+ Days of Sunshine!

- **Confirmed potential by three independent studies**
- **Largest DoD Growth**
  - **$4.8B in Construction**
  - **300% Population Increase**
- **Home of BCT Modernization**
- **Premier Joint Mobilization Station**
- **Power Projection Platform**
- **Joint/Interagency Training Capability**
- **Superb Community Support/ Partnership Potential**

" Fort Bliss is ideally situated to generate renewable energy to meet mandated goals and will play a significant role in contributing to Army-wide performance."

- Tiger Team Assessment

Operational Energy and Non-Traditional Installations



From: Organized Chaos OIF 1 → **To: Concept of Zero Footprint Camp**

- **Zero Footprint Camp**
- Increase Base Camp Sustainability
- Systems of Systems Approach - Master planning and construction
  - **Micro-grid technologies** to gain power generation efficiencies and incorporate potential of renewable and waste-to energy power generation
  - Facilities maintenance - Showers, laundry, feeding
  - Environmental stewardship
  - Waste management - burning, incineration, recycling
  - Water management

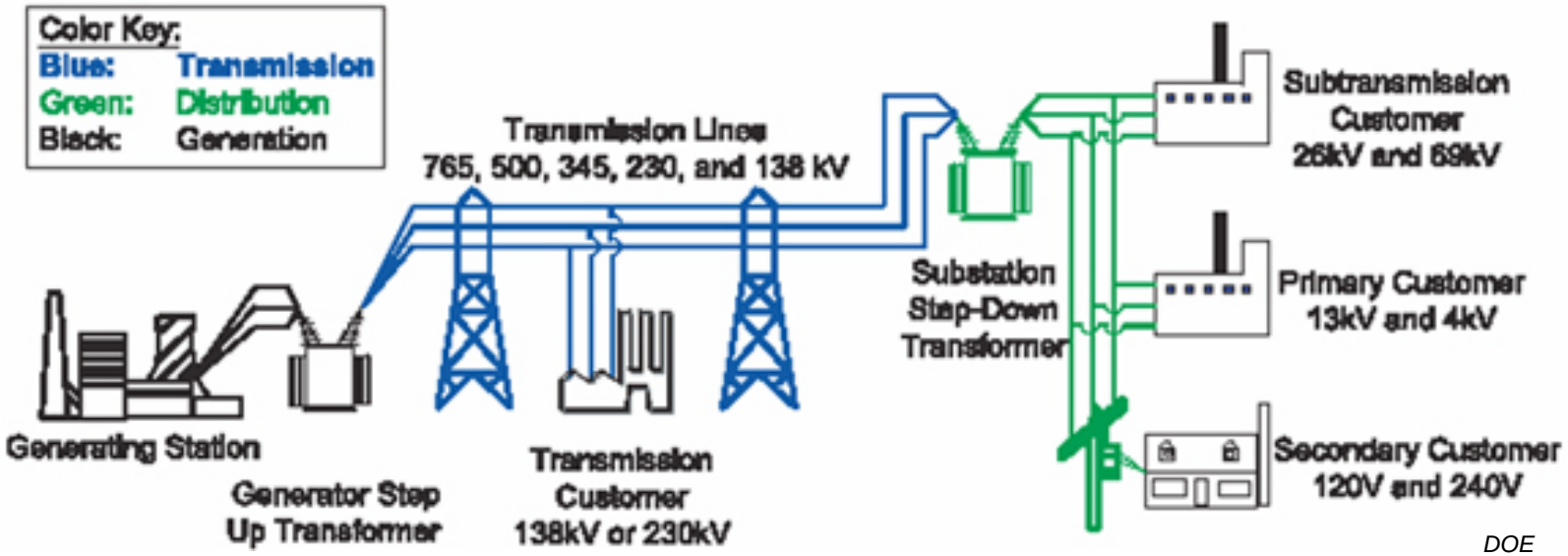
"Unleashing warfighters from the tether of fuel and reducing our installations' dependence on a costly and potentially fragile power grid will not simply enhance the environment, it will significantly improve our mission effectiveness."

Dr. Dorothy Robyn, Ph.D.
Deputy Under Secretary of Defense
Installations & Environment

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

Is it Version 2.0 Yet?

America cannot build a 21st Century energy economy with a mid-20th Century electricity system.
– Secretary of Energy Steven Chu



"If Alexander Graham Bell were somehow transported to the 21st century, he would not begin to recognize the components of modern telephony – cell phones, texting, cell towers, PDAs, etc. – while Thomas Edison, one of the grid's key early architects, would be totally familiar with the grid" - *DOE*

Recent Reports Highlight Grid Issues

"North America's electric system is facing serious challenges"

"The recent downturn in the economy masks areas of grid congestion."

– *Energy Business Reports, 5 Aug10*

"Computer networks controlling the electric grid are plagued with security holes"

"A lack of sufficient encryption for communication lines…was another security gap"

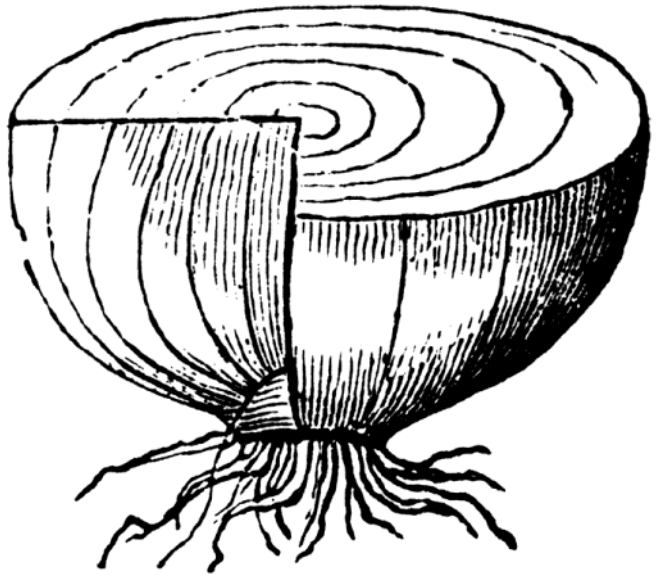
– *Wall Street Journal, 3 Aug 10*

"The U.S. electrical grid is under attack from Russian and Chinese cyber spies who have inserted software that could disrupt the system"

– *CBS/AP, 8 Apr 09*

Quo Vadis, Edison?

- Protect Critical Infrastructure/Missions
- Reduce Consumption
- Increase Efficiency
- Expand On-site Generation
- Partner with Industry
- “It’s Like an Onion”



Asa Gray, *Introduction to Structural and Systematic Botany* New York: Ivison, Blakeman, Taylor & Co., 1874109

Conclusion

A New Energy for America's Expeditionary Army

- The ***Army is answering and leading*** the call for the nation "to face one of the great challenges of our time: confronting our dependence on foreign oil, addressing the moral, economic, and environmental challenge of global climate change, and building a clean energy future that benefits all Americans."

- ***Leveraging the inter-agency process*** to lead in the transformation of the ways we produce and use energy for the sake of our environment, our economy, and our security.

- Continue to ***lead by example using public and private cooperation*** to meet our nation's security needs.

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!