ENERGY FOR THE WARFIGHTER:

The DoD Operational Energy Strategy

Office of the Assistant Secretary of Defense
for Energy, Installations & Environment/
Operational Energy

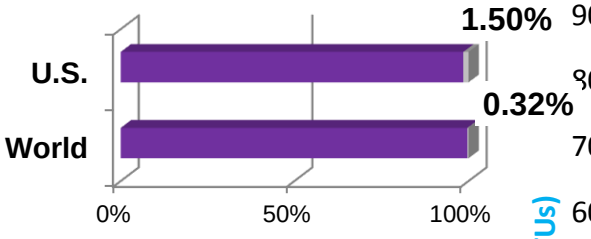
25 August, 2015

Agenda

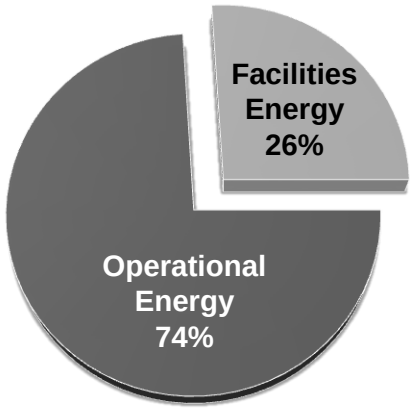
- ❑ DoD as an Energy Consumer
- ❑ Defense Energy Challenges
- ❑ Adapting to a New Environment
- ❑ DoD Operational Energy Strategy
- ❑ Current Initiatives

DoD as a User of Energy

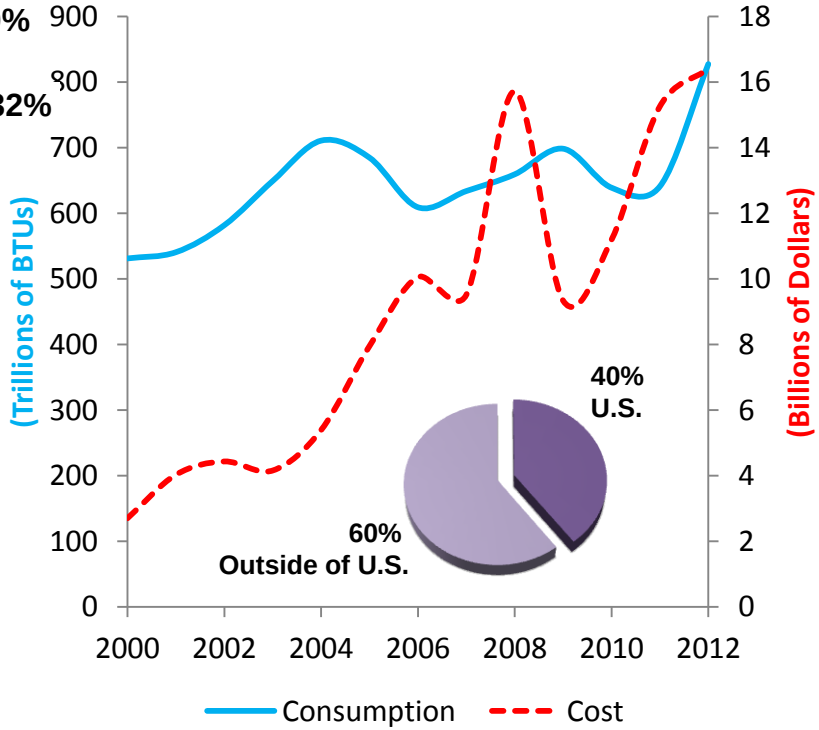
DoD Petroleum Market Share, FY12



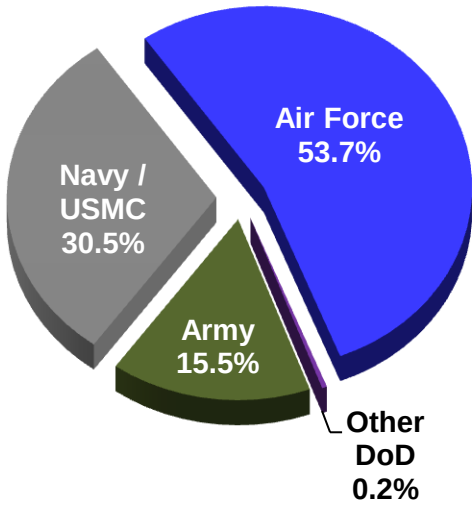
DoD Energy Consumption, FY12



DoD Operational Energy Use and Cost, FY00-12



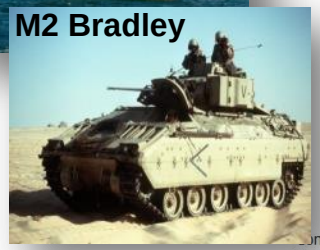
Operational Energy Use by Service, FY12



Operational Energy:	Energy required for training, moving, and sustaining military forces and weapons platforms for military operations
Facilities Energy:	Energy to sustain activities at permanent military installations, including non-tactical vehicles

Implications for Defense Capabilities

More Capability, More Energy



Range
Endurance
Payload
Speed
Survivability

While enabling capability, increased energy requirements also bring risk

Defense Energy Challenges

Logistics Resupply

Refueling

Powering Base Camps

Distance

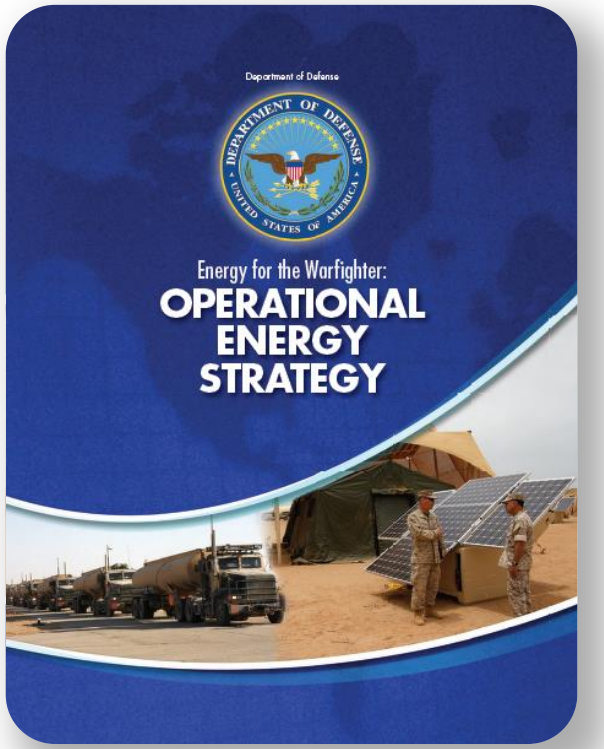
Distributed Operations

Warfighter

Anti-Access/Area-Denial and Irregular threats create theater-wide risks

Adapting to a New Environment

- **2015 Energy KPP in JCIDS Manual**
  - The Energy KPP balances the energy performance of a system with the resources required to sustain that system
- **2014 Quadrennial Defense Review**
  - "The Department has invested in energy efficiency, new technologies, and renewable energy sources to make us a stronger and more effective fighting force."
- **2012 Defense Strategic Guidance**
  - "U.S. military will invest as required to ensure its ability to operate effectively in anti-access and area denial (A2/AD) environments"
- **2012 Joint Operational Access Concept**
  - "Decrease the logistical appetite of joint forces in all classes of supply, but especially in fossil fuels"
  - "Force developers must seek to reduce logistical demand throughout the force"
- **2012 Army-Marine Corps Access Concept**
  - "Reducing overall logistics demand, especially bulk liquid and energy consumption, will greatly assist in countering area-denial strategies"

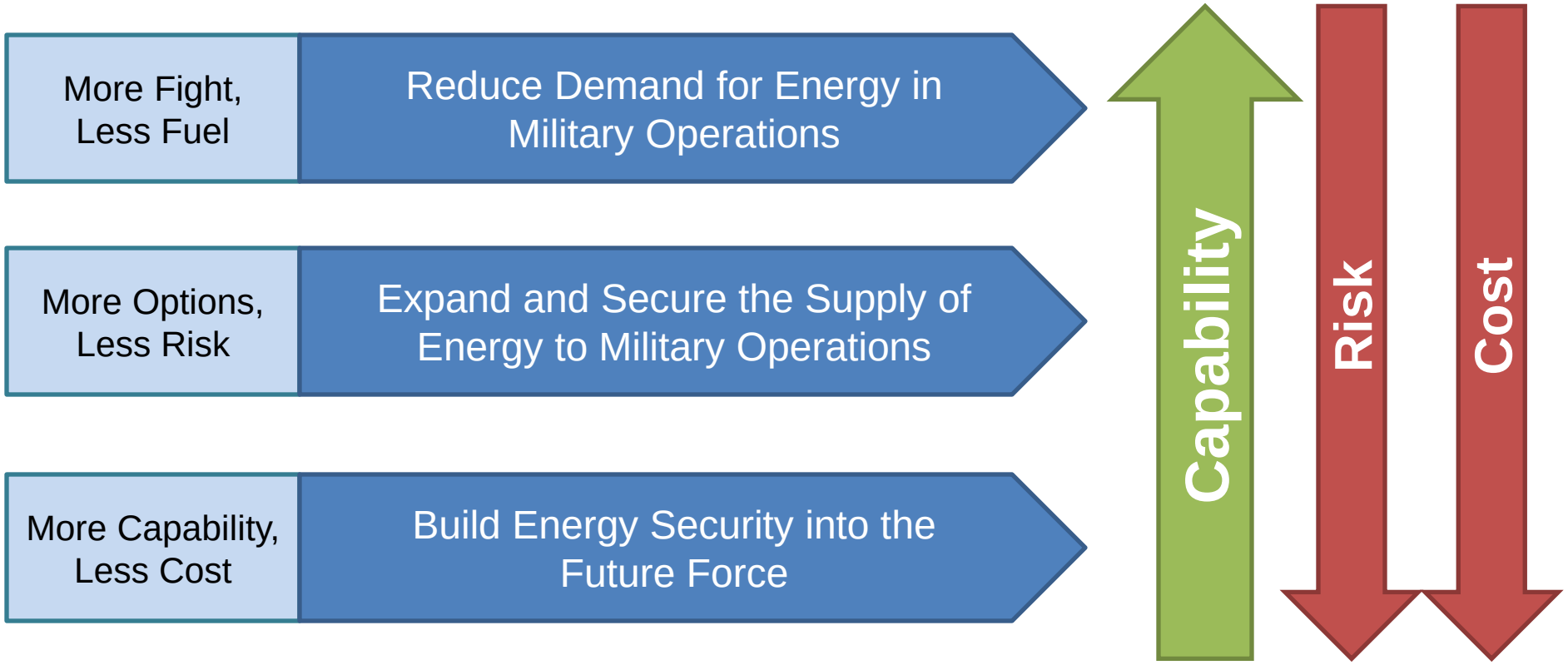


"DoD invests in energy efficiency, new technologies, and renewable energy sources at our installations and all of our operations because it makes us a stronger fighting force and helps us carry out our security mission."

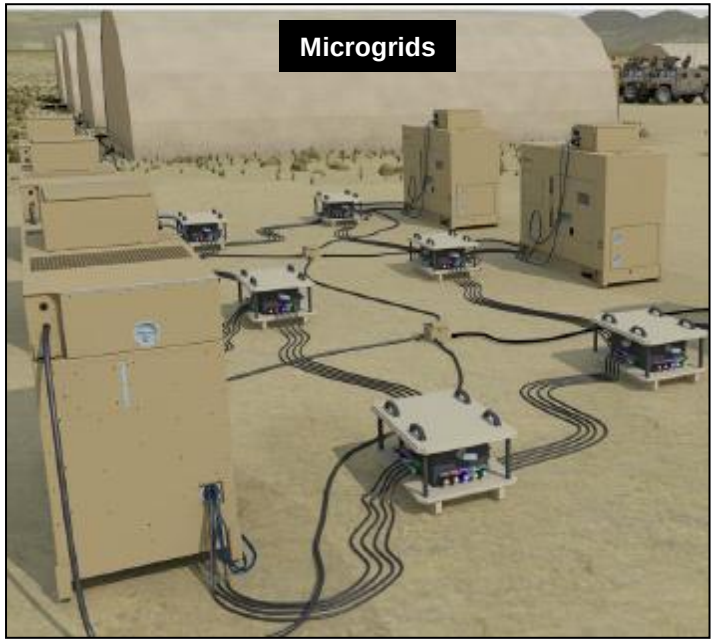
– Secretary of Defense Chuck Hagel, 22 Nov 2013

The DoD Operational Energy Strategy

- **GOAL: Assure that U.S. armed forces have the energy required for 21st century military missions**



Current Initiatives: Contingency Basing



Current Initiatives: Warfighter Power

Operational Energy Capability Investment Fund

Modeling and Simulation Tools

Requirements Development

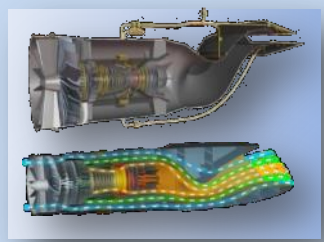
Integration

State of the Art Innovation

Lightening the Load

Current Initiatives: Aircraft, Combat Vehicles, and Ships

AIR



Adaptive and Efficient Engines

Advanced engines can reduce consumption by 25% and increase range by 30%

Operating Procedures

Improved cargo loading and routing contributed to the Air Force transporting 9.5% more cargo per gallon of fuel than three years ago

Improved Turbine Engine Program

Increased lift/range in hotter conditions and at higher altitude, with reduced fuel consumption and maintenance

LAND

M1 Auxiliary Power Unit

Using the APU, rather than the main engine, extends range by reducing sustainment requirements

SEA

Energy Dashboard

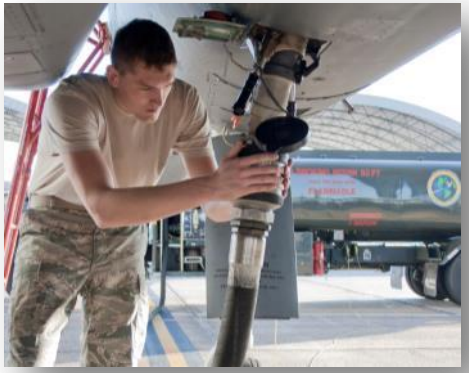
Dashboards provide actionable information to commanders

USS America

USS America is equipped with an electric auxiliary propulsion system, making it one of the most energy efficient amphibious assault ships in the fleet.

Current Initiatives: Alternative Fuels

- **Established policy**
  - Standardize process testing and certification
  - Set criteria for field demonstrations
  - Set criteria for bulk fuel purchases equal or better than traditional fuels in terms of performance, compatibility, cost, emissions



- **Certifying and qualifying equipment**
  - Ships, jets, vehicles approved to use a range of alternative fuels

- **Supporting development of biorefineries**
  - $170M for 100M gallons annually
  - Seeking competitively priced drop-in fuel for commercial and military applications

Current Initiatives: Adapting the Future Force

- **Realistically explore risks and opportunities**
  - Wargames, Modeling and Simulation (M&S)
  - Operational Energy injects to the library of Joint Publications
- **Adapt requirements for future systems**
  - Include energy as a Key Performance Parameter further “upstream”
  - Evaluate effects of energy on mission performance, supportability
- **Adapt acquisition processes**
  - Consider costs of delivered energy and total ownership costs
  - Increase oversight in Defense Acquisition Boards
- **Make strategic investments**
  - Incentivize long-term R&D in line with *Operational Energy Strategy*

Questions

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