



2006 PEO/SYSCOM COMMANDERS' CONFERENCE

Energy Efficiency for Tactical Systems

———— Energy Leadership
———— A Fuel Efficient Force

Mr. Chris DiPetto
Deputy Director, Systems & Software
Engineering

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Energy Leadership

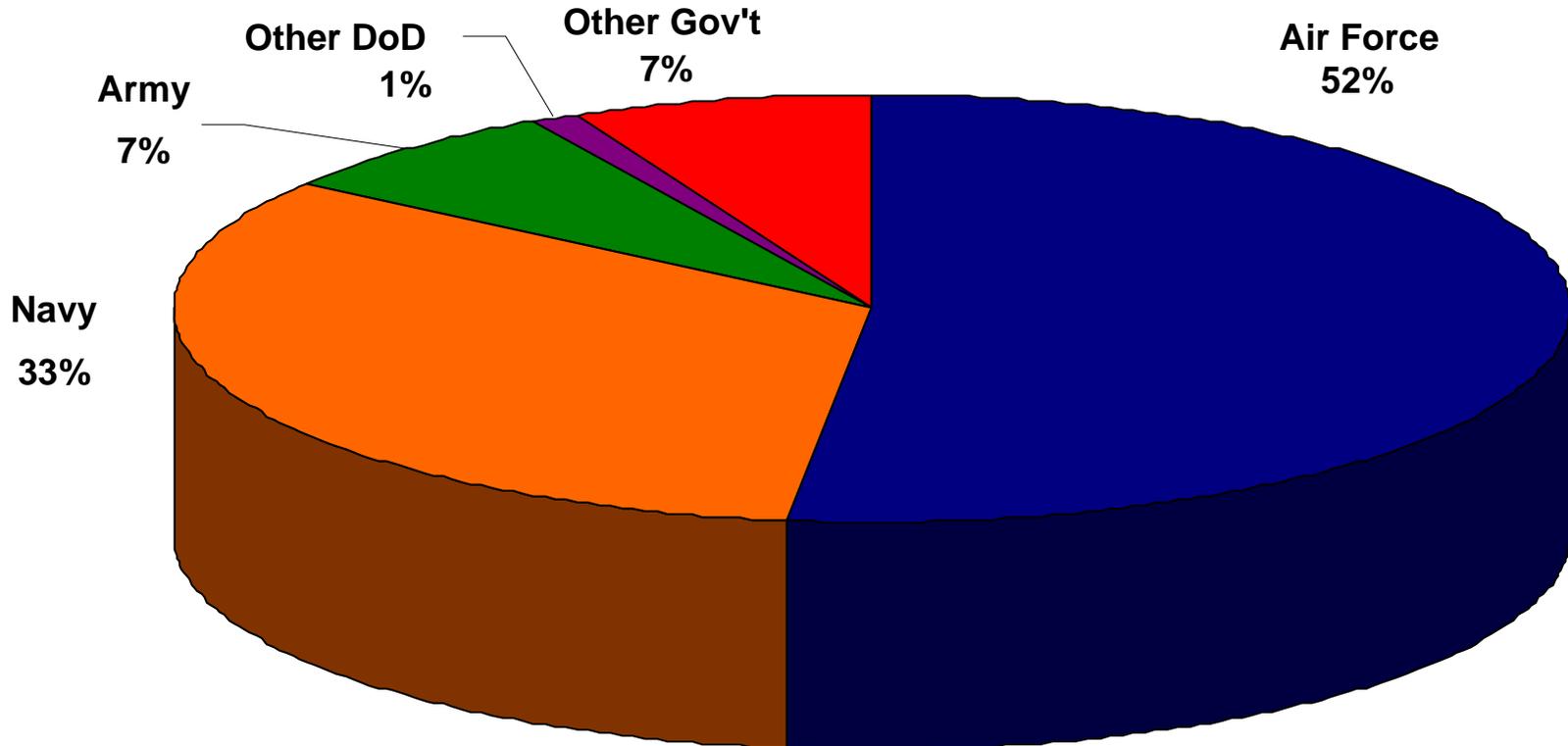
- DoD dependence on foreign oil increasing
- \$10/barrel increase in oil increases DoD costs by roughly \$1.8B
- Energy Impacts warfighting – huge tail required to deliver fuel; impacts: deployability, persistence, range...

Energy is a
National Security Issue



Understanding the Problem

US Government Fuel Consumption (Petro Based Products)

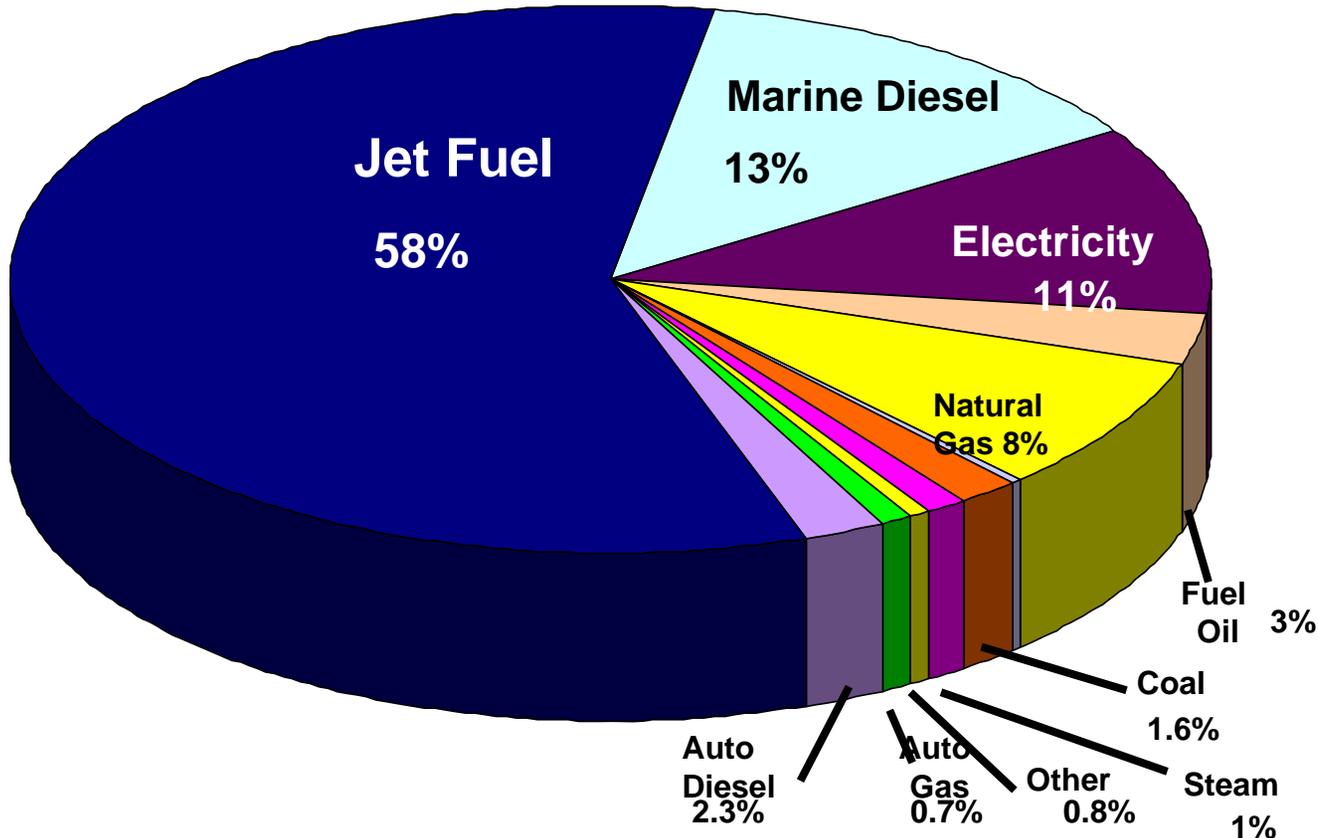


DoD Uses 93% of all US Government Fuel Consumed



Understanding the Problem

Percent of Total DoD Energy Use



Consumption drivers are mobility fuels

Jet fuel and marine diesel account for 71% of



DoD Studies

- Several studies on energy have been conducted
 - Defense Science Board (DSB) Task Force on DoD Energy Strategy (2001)
 - Technologies for Reducing Dependence on Fossil Fuels; (JASONS)
 - Energy Security IPT (OSD)
 - National Security Implications of America's Energy Policies: Phase I (RAND)
 - Business Case Analysis New Platform Designs; (IDA)



Findings

- Misaligned Incentives
 - Costs and benefits on different budgets
 - 'Owner' of budget that will be burdened with cost will not see benefit so decision to incur cost is not made
 - 'Recipient' of benefit has decision-making authority but no budget responsibility and has no incentive to consider cost
 - Tends to produce poor spending decisions
- Absence of Activity–based Costing
 - Driving cost object's (e.g.; training missions) budget burdened with incurred direct & derived costs (e.g., cost of tanker fuel delivery to training aircraft)



Energy Security Task Force

- Address SecDef tasking:
 - DDR&E will chair a task Force with representatives from the Military Services, Defense Agencies, USD(ATL), USD(P), and USTRANSCOM to define an investment roadmap for lowering DoD's fossil fuel requirements and develop alternate fuels.
- Proposals to improve energy efficiency
- Recommendations to enable the production and use of alternate fuels
- Provide options to manage financial and operational challenges generated by cost and availability of oil and other forms of energy



Energy Security Task Force Recommendations

- Increase platform efficiency
 - Revise policy to incorporate delivered cost of fuel in acquisition
 - Develop and test efficient propulsion systems, power generators and machinery
 - Develop and prototype light weight vehicles and structures
 - Strive for operational efficiencies and simulation use
- Establish alternate fuels program
 - Mature and test synthetic/alternative fuels
 - Measure and assess DoD energy progress
 - Develop incentives programs for alternate fuel industry
- Accelerate installations' initiatives
 - Meet or accelerate energy efficiency goals
 - Address non-tactical vehicles
 - Expand energy conservation investment program/energy saving performance contracts



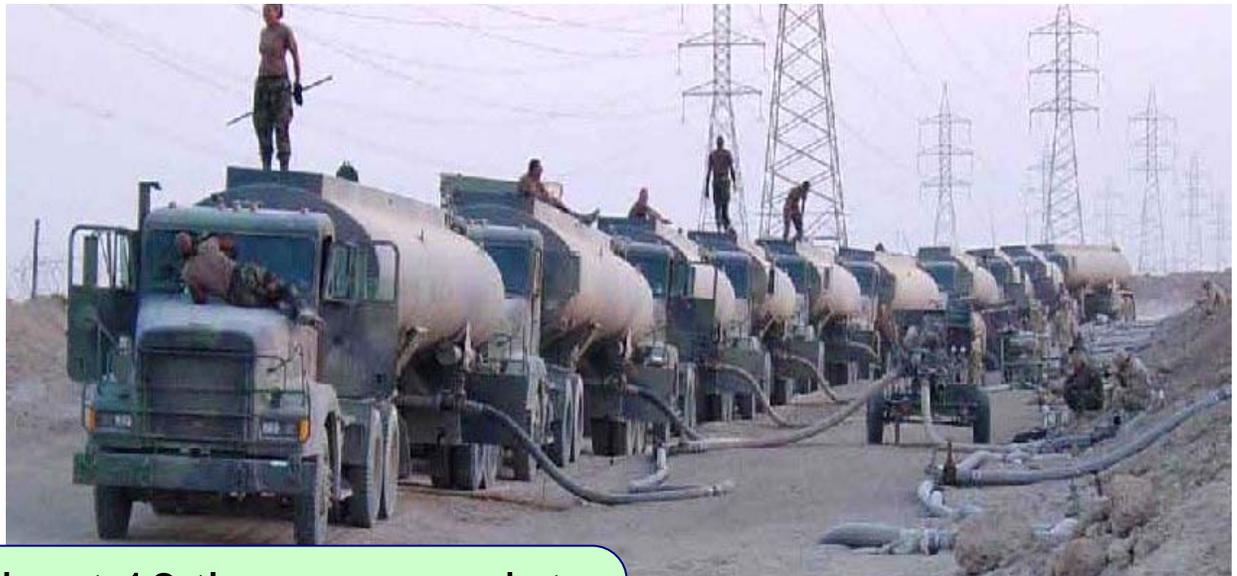
Findings

- Fully burdened cost of fuel
 - DoD currently prices fuel based on wholesale refinery price (Commodity Cost)
 - Does not include the last mile personnel, infrastructure, force protection



Fully Burdened Cost Of Fuel

If you summed all the all the capital assets (e.g., Navy oilers, AF tanker A/C, Army tank trucks) and base infrastructure, added personnel costs (20K active duty in Army), included supply pyramid protection requirements in theater, The DESC “commodity” cost of fuel starts looking small.....



It costs the Army about 16 times as much to deliver fuel as to purchase it....”



Valuing Energy In Design

Investments in End-Use Efficiency at the Spear Tip
Cascade Down the Supply Pyramid

Valuing Energy
Efficiency Reduces this



So you can get more of this





Issue

- **Valuing energy in weapons design**
 - But its not just the Commodity Price – It's the way we Value energy in the Life Cycle of the system
 - An end-to-end view of fuel utilization in platform selection and design decisions reflects the true value of fuel
 - How do we value investments in energy efficiency when benefits may be difficult to monetize?



Discussion

- **Use of Fully Burdened Cost of Fuel In LCC selection and design trades:**
 - **3 Pilot Programs:**
 - Joint Light Tactical Vehicle (JLTV) (MS B mid 2007)
 - Maritime Air and Missile Defense of Joint Forces alternative ship concepts AoA (MS B mid 2007)
 - Long-range strike concept decision (MS B FY11)
 - **Time for you to influence the policy:**
 - » How?
 - » What Can I do?
 - » Where does the number come from?
 - » What do I need from OSD?, my service?
 - » Hard Points?



Discussion

- **JROC recommendation to apply an Energy Efficiency KPP to selective programs**
 - **We need your insight:**
 - **How do we do this?**
 - **What Does this mean?**
 - **What are the touch points ?**



Energy Leadership

**Who Benefits from DoD
Effective Energy Management ?**





Backup

Backup Slides



Fully Burdened Fuel Cost Pilot Program

- DUSD (A&T) oversight
- Program will apply business process principals to quantify the DoD fully burdened cost of fuel and how incorporate results into investment decisions
- Integrated Product Team (IPT) established to develop the policies and procedures needed to institutionalize policy
- Working group for technical and analytical support to PMs
 - Assist in developing methodologies
 - Review adequacy of existing policies and procedures to reveal investment tradoffs available
 - Identify linkage between investments that may increase first cost but provide attractive ROI by reducing sustainment costs
 - Interact with R&D organizations to identify technologies to improve the efficiency of systems



Recommendations

- Recommendations from Joint Requirements Oversight Council
 - Selectively apply Energy Efficiency KPP
 - Life-Cycle cost analysis for new capabilities include “fully burdened” cost of fuel during AOA/EOAs design trades
 - Mandate delivered cost of fuel as the basis for acquisition investment decisions throughout Joint Capabilities Integration and Development System (JCIDS)