Operational Energy in the Department of Defense

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Office of the Deputy Assistant Secretary of Defense (Operational Energy)

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What is Operational Energy?
Energy for Warfighting

More Capability, More Energy

Range
Endurance
Payload
Speed
Survivability

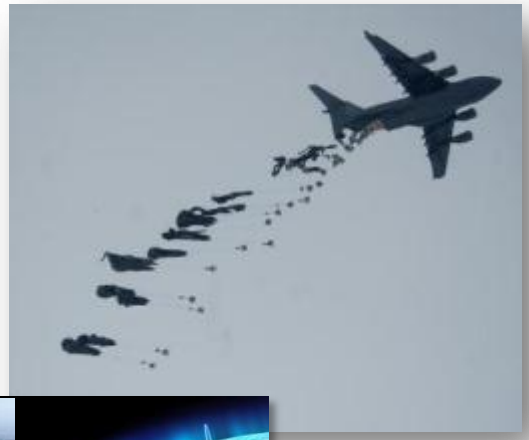
While enabling capability, increased energy requirements also bring risk

Risks to Operational Energy

Anti-Access/Area Denial Threats

Distance/Geography

Distributed Operations



Irregular Adversaries

Peer Competitors

New adaptations needed to succeed in contested operating environments

Operational Energy Strategy

2011

Objectives

- Reduce demand
- Diversify supply
- Adapt the future force

Strategic Focus

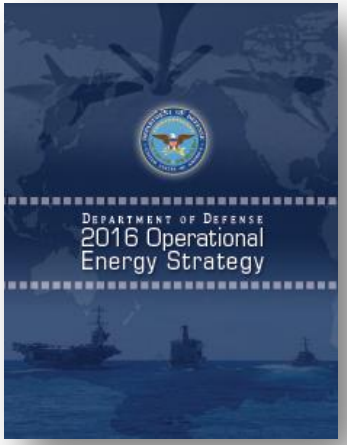
Improve Resilience

Air, Sea, Land Domains

Rebalance to the Pacific

Operations in A2/AD

2016

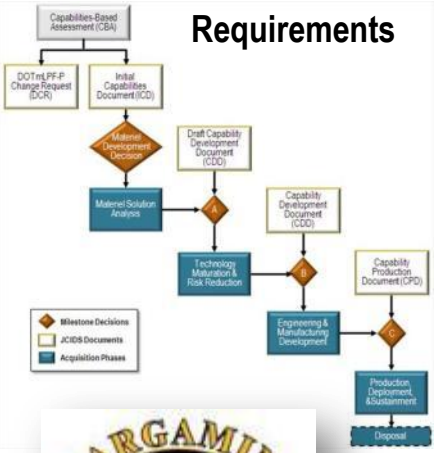


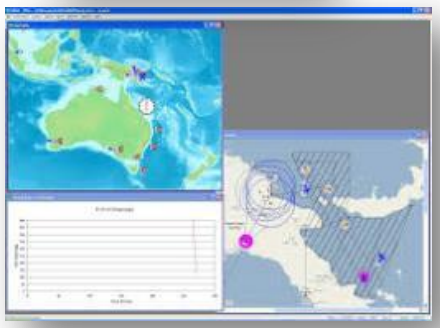
Objectives

- **Improve future capability**
- Identify and reduce risk
- Enhance current operations

Assure delivery of operational energy to the warfighter

Energy Key Performance Parameter (KPP) and Energy Supportability Analyses (ESA)





Modeling & Simulation

- Move <u>upstream</u> in force development
  - Early analysis of energy demands identifies shortfalls
  - Informs development of energy KPP
  - Identified risks can be mitigated or accepted

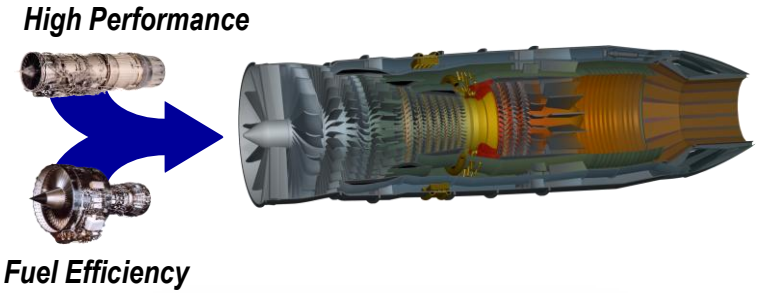
- Wargaming and M&S support ESA
  - Test new concepts and introduce active RED threat
  - Allow multiple iterations, sensitivity analyses

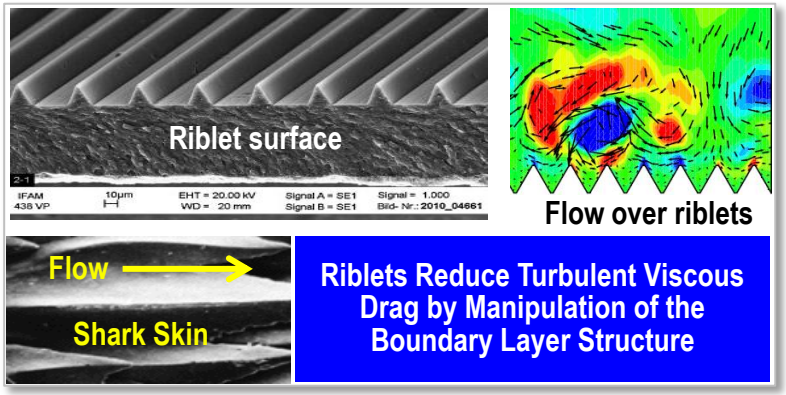
Future Capabilities on the Way

- Adaptive engine technology will provide revolutionary advances in range, persistence, thrust

- Improved helicopter engines will fly at higher altitudes, hotter temperatures, and increase range

- New designs and materials will decrease weight and drag, increase strength





Key Operational Energy Challenge: High Power Weapons


Electromagnetic Railguns


Laser Weapons

- New weapons also will create new energy challenges
- How will we meet these energy needs in contested environments?
- How will we address thermal and power management for these new weapons?

Operational Energy: Critical to Warfighting Capability

Adapting policy, doctrine, forces, and training to ensure OE is not a constraint in operations

- **Improve capabilities of forces, platforms, bases**
  - Provide commanders with options with resilient installations, and forces with increased range and endurance.
- **Lighten logistics footprint and reduced risk from disruptions in energy supply**
  - Ensure uninterrupted operations thus enabling combat forces to focus on operational missions, not force protection
- **Energy-informed force development and planning**
  - Energy analyses drive decision-making in PPBE, requirements, acquisition, operational planning

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