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DOE/DoD Operational Energy Needs and Capabilities

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UNCLASSIFIED Overview



-
- **Energy strategy in the AF**
 - **A bit about Air Mobility Command**
 - **Operational Energy initiatives**
 - **Air Mobility Command/DOE interactions**
 - **DOE core competencies of interest**
 - **Energy and Reason**

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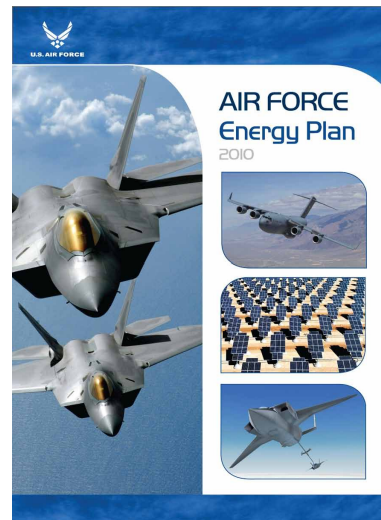
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Air Force Energy Plan



3-Part Strategy

Reduce Demand
Increase Supply
Change the Culture



Vision

Make Energy A Consideration In All We Do

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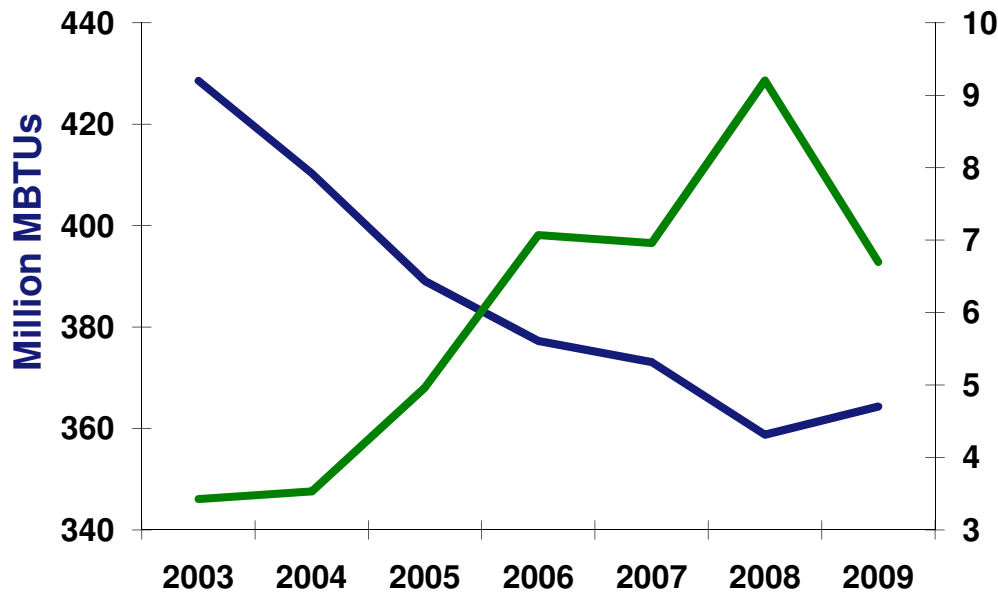


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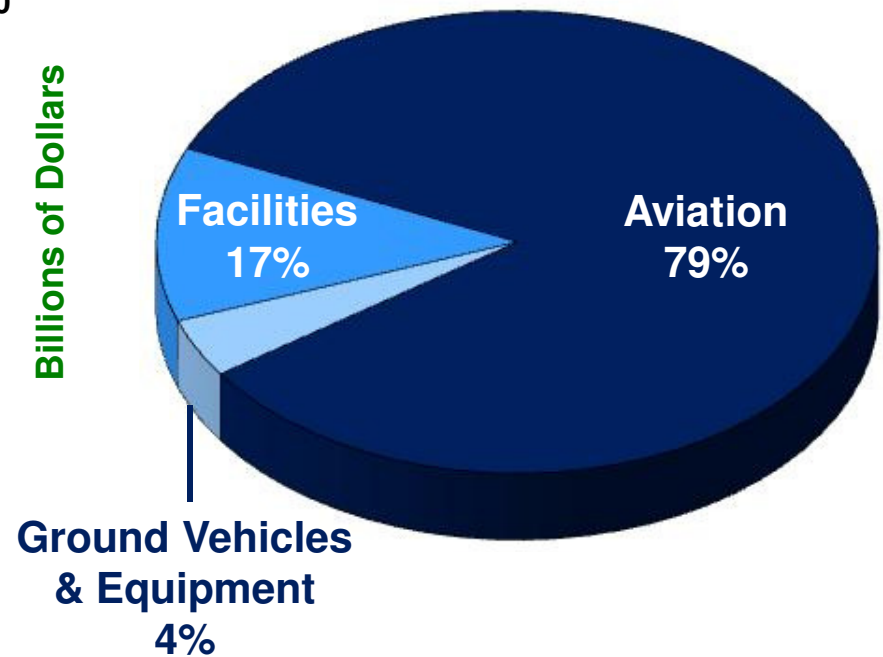


Air Force 2009 Energy Use

Energy Cost and Consumption Trends



Energy Cost Breakdown



The Air Force spent approximately \$6.7 billion for energy in 2009

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Air Mobility Command Vision



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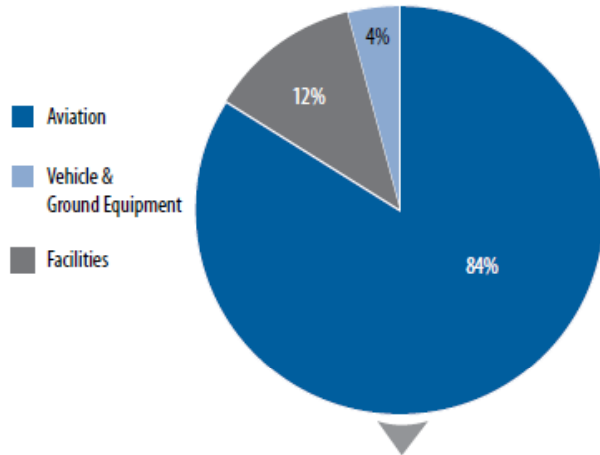


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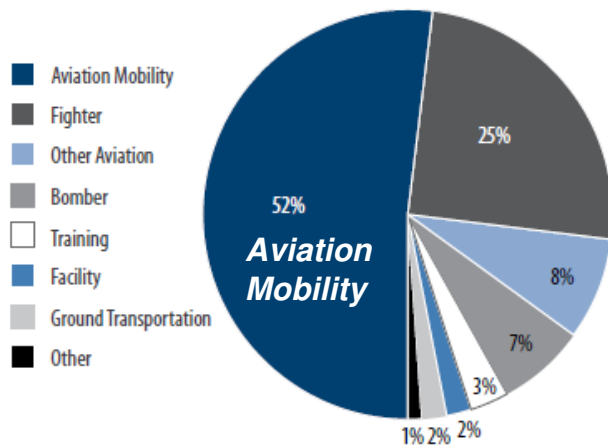


AMC Fuel Imperative

Air Force Energy Utilization
(percent of total energy costs)



Aviation Operations Energy Utilization



AF uses 64% of DOD Energy

Aviation is 84% of Total AF Energy

Mobility is 52% of the AF Aviation

Mobility is 28% of DOD Total

**1% Δ in MAF Fuel Use
= \$41M/Yr**

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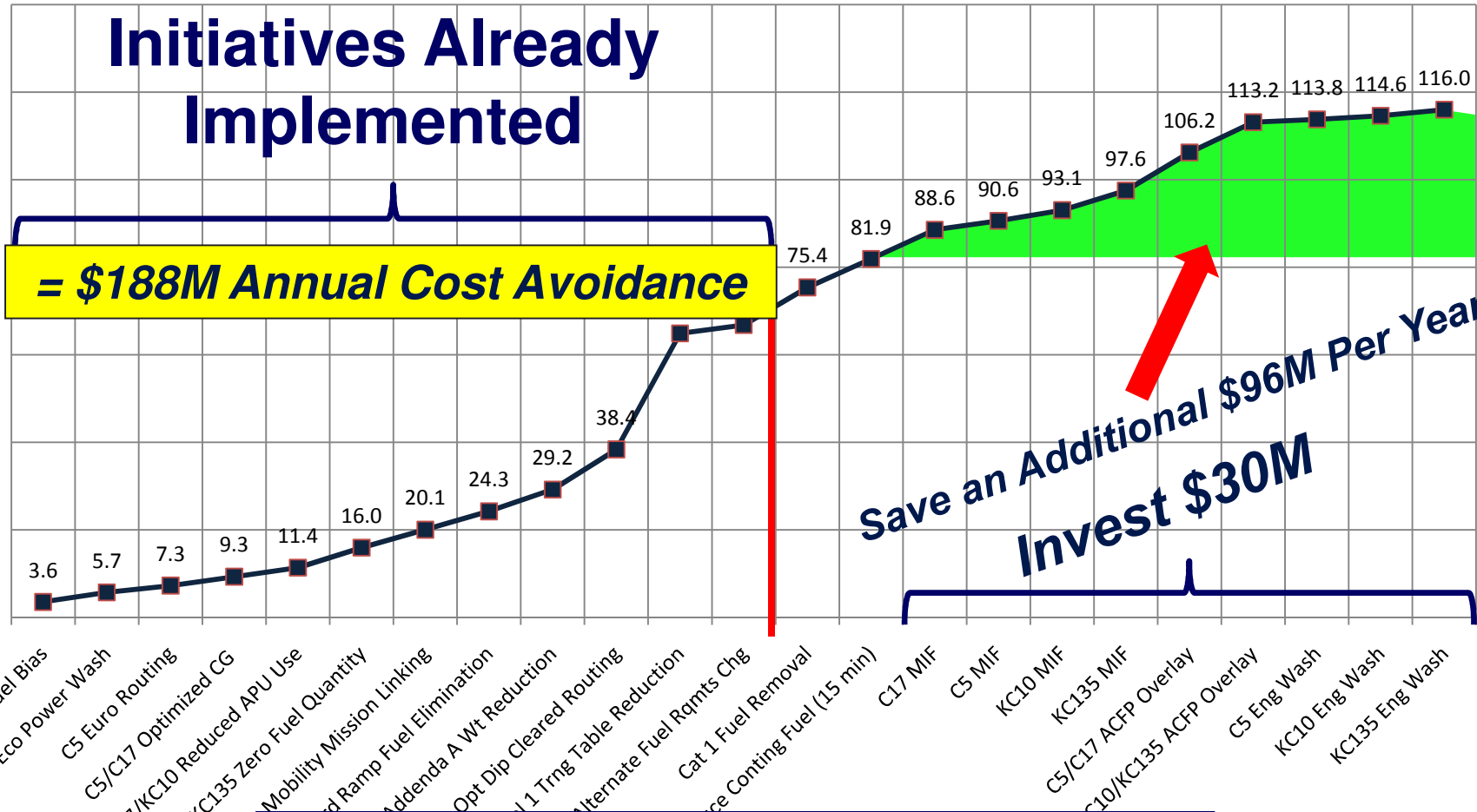


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MAF Cumulative Fuel Consumption Avoided Per Year (Millions of Gallons)



Initiatives Already Implemented



= \$188M Annual Cost Avoidance

**Save an Additional \$96M Per Year
Invest \$30M**

\$327M Total Combined Savings Per Year

Last updated 3 May 10

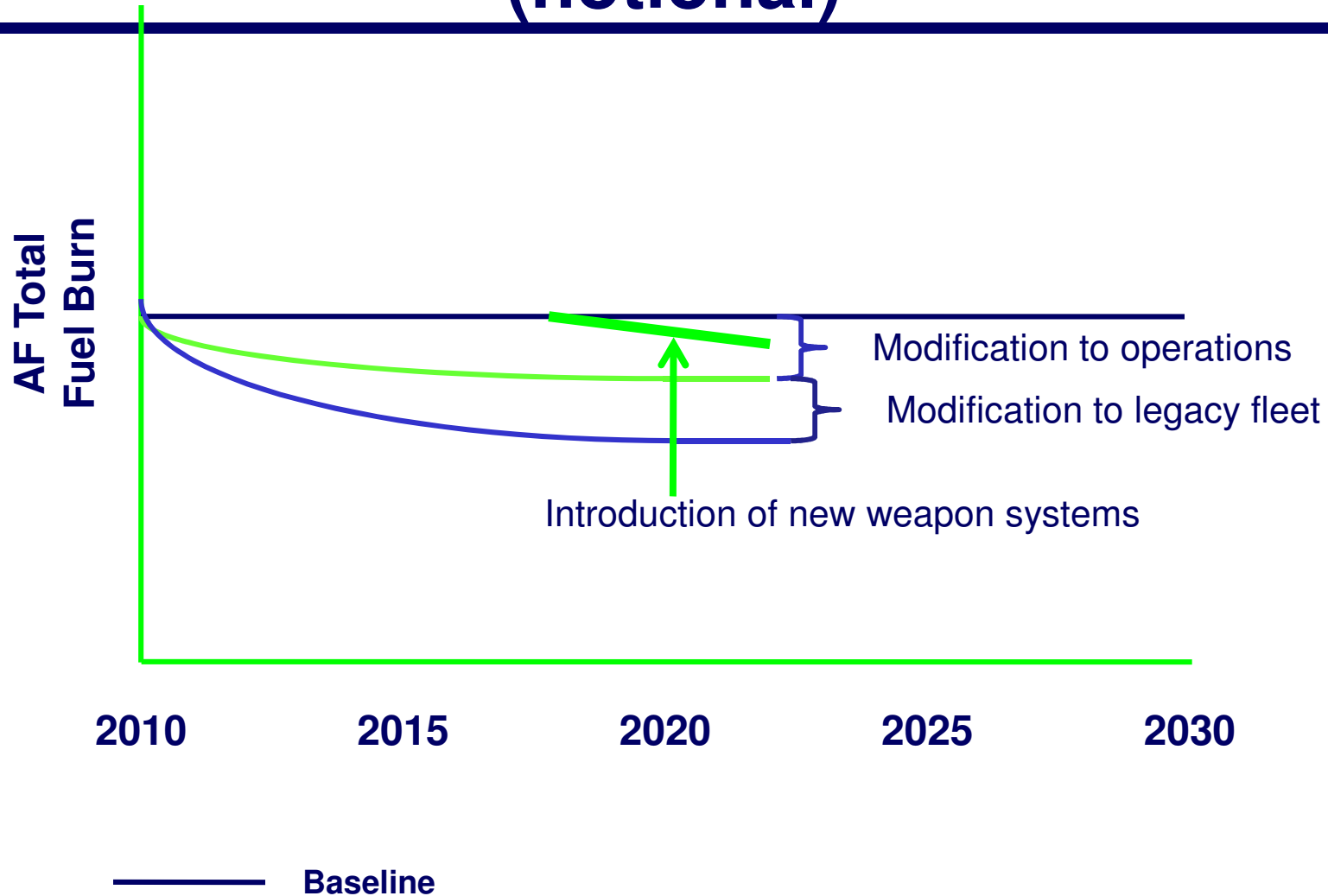
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Operational Fuel Demand (notional)



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Improving Energy Efficiency in the Legacy Fleet



- Assemble team of key personnel across stakeholder organizations (operational MAJCOMs, Product Centers, AFRL, FM, etc.) to provide guidance and direction
 - Engage experienced contractor (s) for study and analysis
 - Review previous studies, OEM inputs, commercial initiatives and develop candidate technologies for insertion into the legacy and develop business cases
 - Projects should reduce fuel burn and be cost effective
 - Identify current AF business practices and provide recommendations on how to business practices should change to include energy considerations
 - Produce actionable recommendations for AF leadership

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Study Structure and Governance



- **Sponsorship: SAF/IE**
- **Steering committee and contractor team mentors**
- **Contractor analysis teams will collect info and analyze**
- **Data gathering, analysis and briefs to Steering Committee members (duration ~6 months)**
- **Final report preparation: 2-3 months**
- **Products: Report with actionable recommendations, Senior level briefings**

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Current Collaborations with DOE Labs



Argonne

- Computational models and decision making
- Supply chain logistics
- Carbon footprint models for aviation

NREL

- Energy audits of AF bases

Pacific Northwest

- Computer algorithms for optimization
- Large aircraft decontamination

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DOE Core Competencies of Use to the Air Force



- Nuclear science
- Detection (e.g., very remote, very small, very few)
- High-power computation
- Environmental science
- Materials science and diagnostics
- Energy production and storage
- Incentives and private/public partnerships

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Energy and Reason



- **Linked by Romantic poet, William Blake in his “Marriage of Heaven and Hell” (circa 1790)**

*Without Contraries is no progression.
Attraction and Repulsion, Reason and
Energy, Love and Hate are necessary
to Human existence.*

- **Reason: contemplation, mind**
- **Energy: action, body**



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Energy and...

- **Capability:** Most new capability comes at an energy cost
- **Operational success:** Efficiency does not always equal Effectiveness
- **Water:** Many energy initiatives are water-intensive
- **Environment:** Need to look at overall environmental impact
- **Unintended Consequences:** ...

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What's on your mind?

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