

Headquarters U.S. Air Force

Integrity - Service - Excellence

U.S. Air Force Energy Program



**GovEnergy
17 August 2010**

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Civil Engineer Strategic Goals

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Our “Proud Heritage”... to a “Promising Future”



Build Ready Engineers

Provide more effective Civil Engineer expeditionary and emergency response and management capabilities to meet current and emerging Air Force and CCDR requirements

Build Great Leaders

Organize, develop, enable, and retain a trained and capable Total Force Civil Engineer team ready to meet current and emergent mission requirements

Build Sustainable Installations

Develop sustainable installations by implementing asset management principles for built and natural assets.

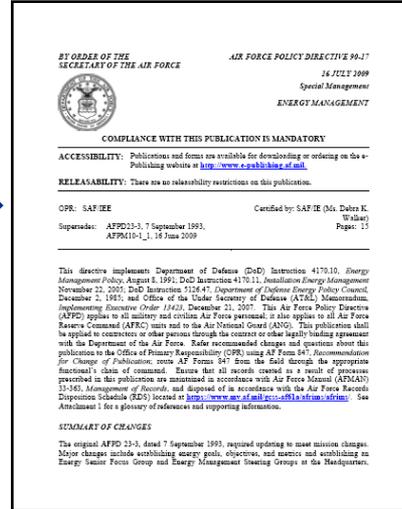


“Build to Last ... Lead the Change”

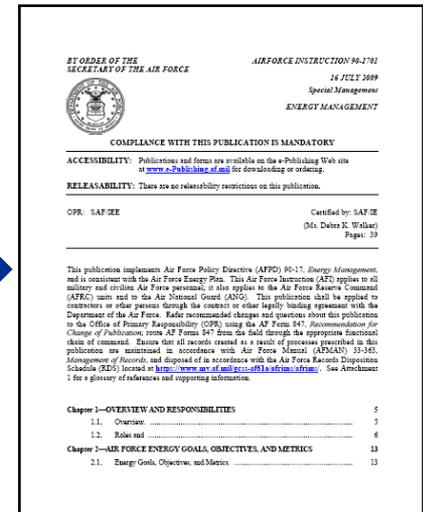


Air Force Energy Policy

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AFPD 90-17
Signed 16 July 2009



AFI 90-1701
Signed 16 July 2009

**Formally established the AF Energy Program:
Strategy, Goals, Objectives and Metrics**



Bottom Line up Front

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- **AF Facility and Infrastructure Energy Strategy**
 - **Be a DoD energy leader....meet mandates (statutory, executive orders, AF corporate) and provide energy security**
 - **Improve mission support - smart investments in reliable infrastructure to build sustainable installations**
 - **Focus funds: invest \$250M in FY11, \$225M per year in FY12-15**
 - **Max all funding sources: ECIP FY11-16 (\$210M expected)**
 - **Mitigate Risk: Leverage third party funding such as Power Purchase Agreements (\$400M in planning) and ESPCs**

Investing \$900M (FY12-15) avoids an extra \$2B+ in energy/water bills



Goals and Mandates

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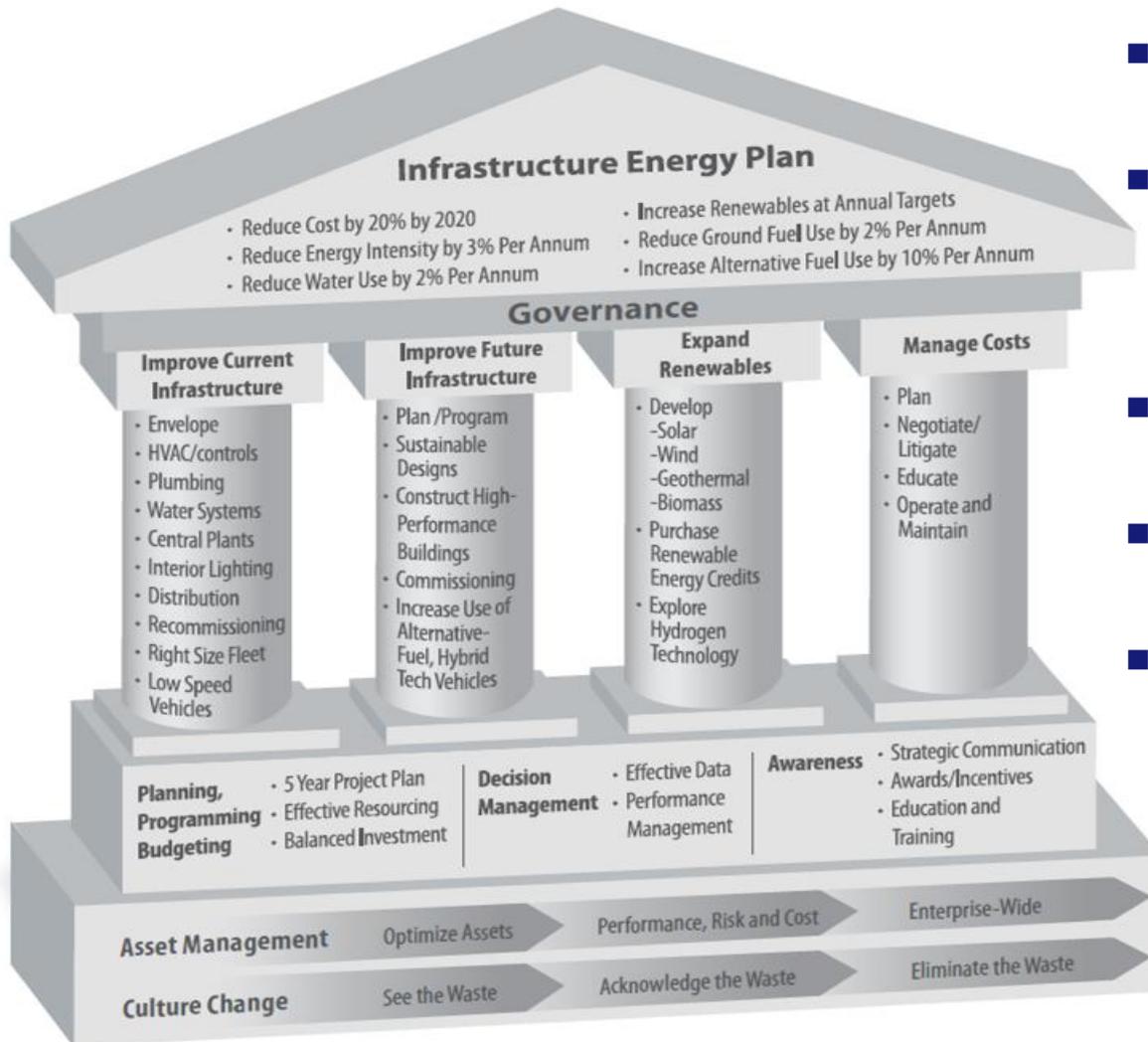
Goal Title	Driver	Baseline (FY)	Annual Target	Final Goal	Goal (FY)	Future Target	Final Goal (FY)
Reduce Facility Energy	EISA 07	2003	3%	30%	2015		
Reduce Facility Energy	EO 13514	2015	1.5%	37.5%	2020		
Reduce Greenhouse Gases	EO 13514	2003	3%	35.1%	2015	1.5%	2020
Renewable Energy Use	EPAAct 05	2005	5%	7.5%	2013	7.5%	2025
Renewable Energy Use	USC 2911	2013	1.5%	25%	2025		2025
On-Base Renewable Energy	AF	2008	--	1%	2012	3%	2015
Reduce Water Use	EO 13423	2007	2%	16%	2015		2015
Reduce Industrial Water Use	EO 13514	2007	2%	26%	2020		2020
Audit Covered Facilities	EISA 07	2009	25%	100%	2012		Indef
Meter Facilities (elec)	EPAAct 05	2008	--	100%	2012		2012
Meter Facilities (gas/steam)	DOD 4170.00	2008	--	100%	2016		2016



Strategy Guides our Investment

2010 Air Force Infrastructure Energy Plan

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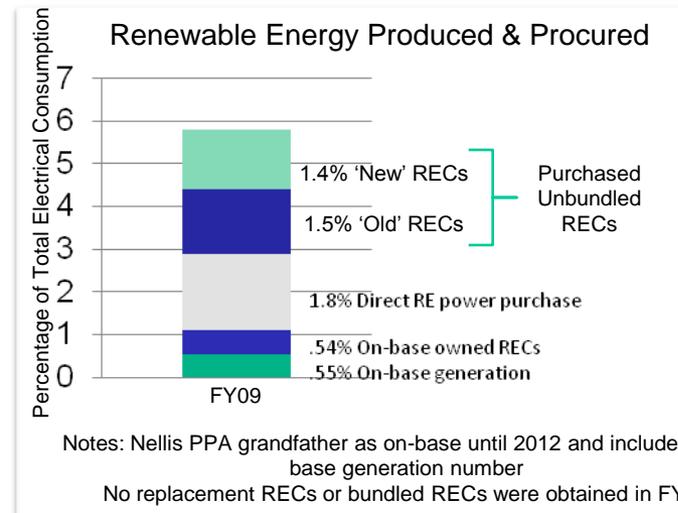
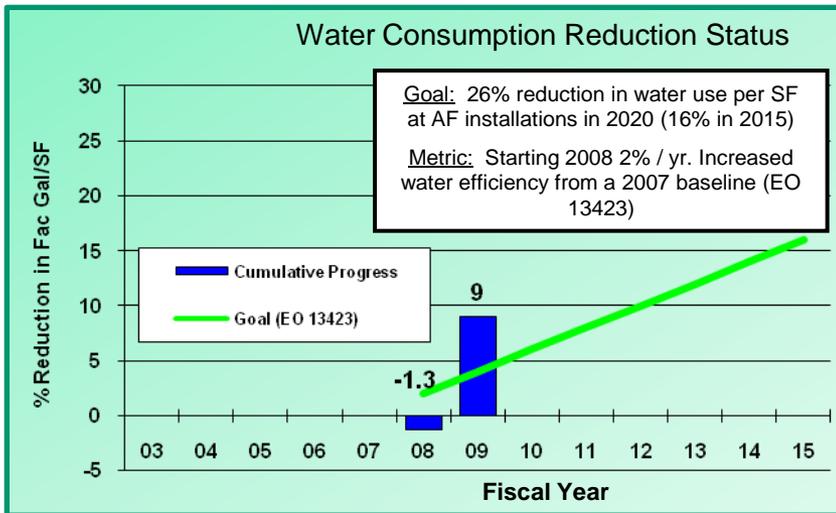
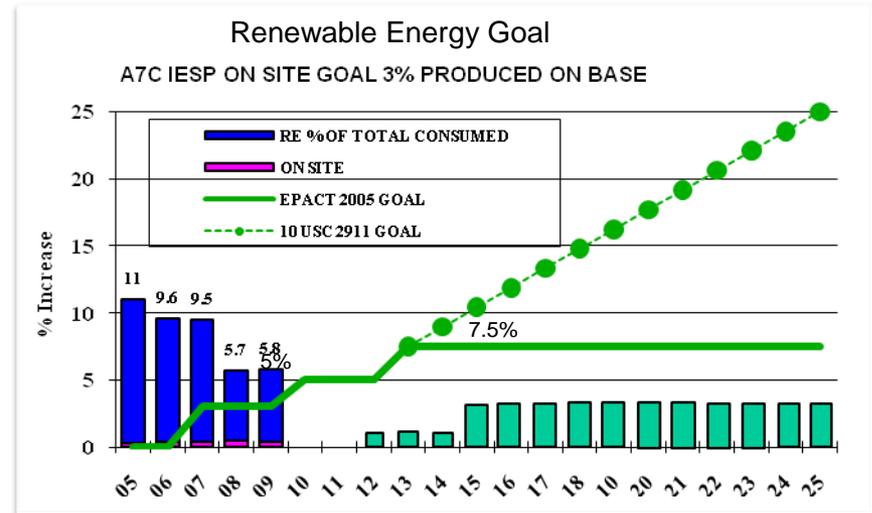
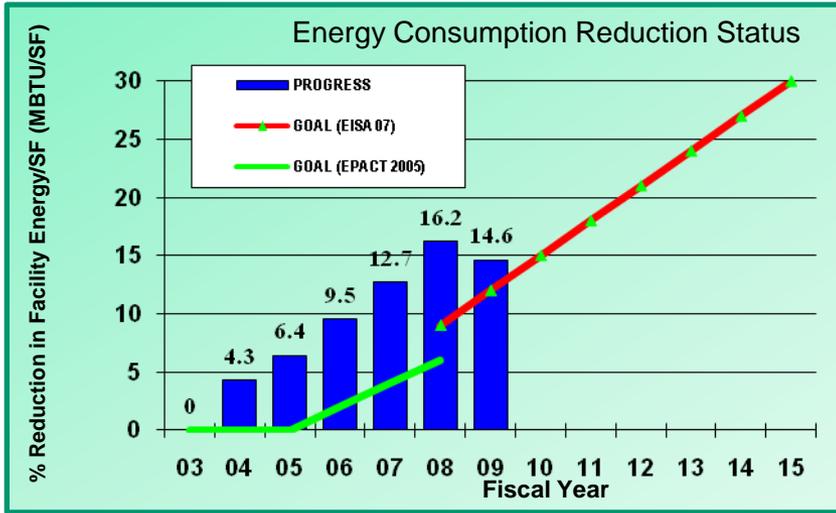


- AF energy investment follows a strategy to achieve mandates
- The 2008 Infrastructure Energy Strategic Plan (IESP) is the baseline: Consolidated 60 energy mandates into 1 doc
- A7C IESP fed into the 2010 AF Energy Plan
- We track mandates post-2008 in our “working plans” and metrics
- A7C’s Energy Master Strategy Implementation Plan
 - “Living document” with 9 major capabilities
 - Ties the master strategy to execution with metrics



Metrics

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Air Force Energy Plan

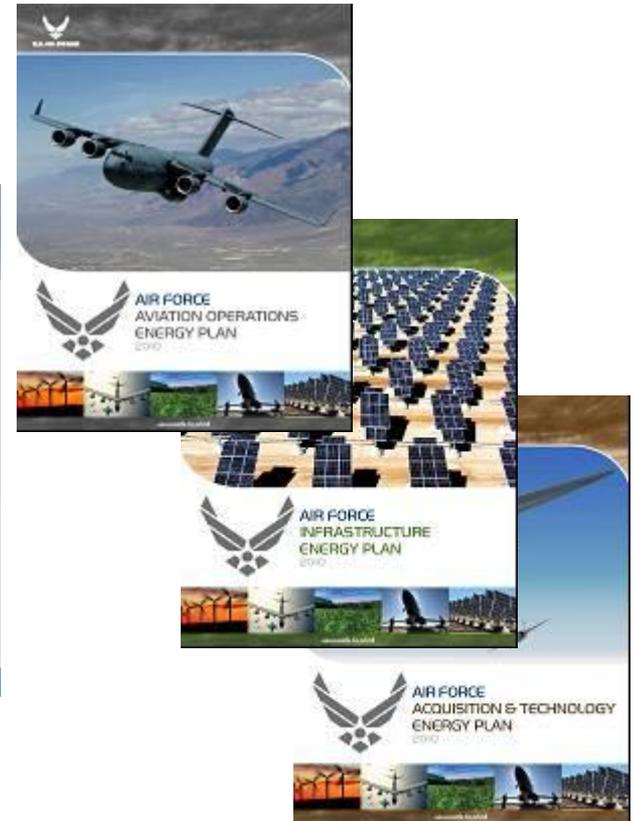
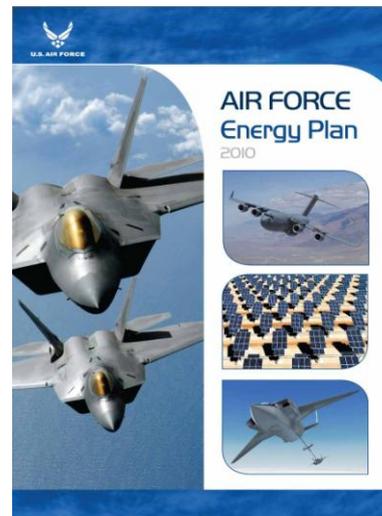
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3-Part Strategy

Reduce Demand

Increase Supply

Change the Culture



Vision

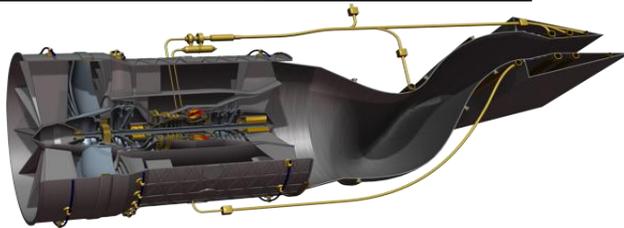
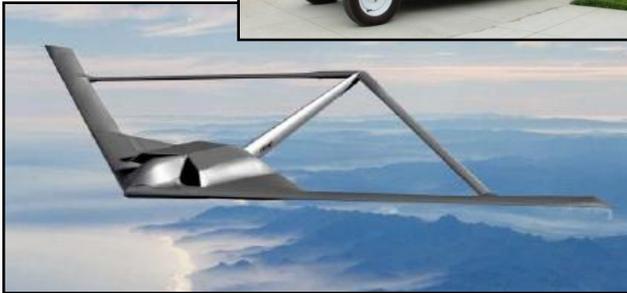
Make Energy A Consideration In All We Do

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Reduce Demand: Focus Area Initiatives



Aviation

- Reducing aircraft weight
- Optimizing flight routes
- Evaluating training fuel loads

Infrastructure

- Decreasing energy use
- Purchasing energy efficient supplies and low-speed vehicles
- Reducing vehicle fossil fuel use

Acquisition & Technology

- Designing more efficient and adaptive engines
- Pursuing more energy efficient aircraft



Reduce Demand: AMC Aviation Ops Fuel Demand

- Aviation operations fuel use has been reduced 2.7% from 2006 to 2009
 - Changed C-17 H₂O engine wash, which resulted in increased fuel efficiency and \$3.5M savings
 - Conducted successful Altus AFB test of KC-135 radar pattern 'clean configuration', resulting in a 3.5% fuel savings during pattern operations
 - Reduced C-17, C-5, C-130 and KC-135 ramp loads to capture potential fuel savings
- Emission reduction is over 800,000 metric tons CO₂ – equivalent to removing nearly 150,000 cars from U.S. highways for 1 year



2015 Goal: Reduce aviation ops fuel demand by 10% from 2006 baseline



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Increase Supply: Focus Area Initiatives



Infrastructure

- **Purchasing green power for facility consumption**
- **Exploring commercial-scale energy projects**
- **Using ethanol and biodiesel flex-fuel vehicles**
- **Testing deployable alternative fuel stations**

Acquisition & Technology

- **Testing and certifying alternative aviation fuels**
- **Researching new renewable energy opportunities**



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Increase Supply: Alternative Aviation Fuel Initiative

- By 2016, USAF will be prepared to cost competitively acquire 50% of its domestic aviation fuel requirement via an alternative blend
 - Alternative fuel component will be produced in a manner **greener** than fuel produced from petroleum
 - USAF depends on commercial suppliers for actual fuel production and availability
- USAF is on track to complete by early 2011 certifying aircraft, infrastructure, support equipment and vehicles for unrestricted operational use of Fischer-Tropsch-derived synthetic fuel blend



***USAF recently began the biomass-derived fuel
blend certification initiative***

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Increase Supply: Biomass-Derived Fuel Blends

- “Hydrotreated Renewable Jet” (HRJ) Fuel Blend
 - Blend consists of biomass-derived and conventional JP-8 jet fuel
 - Biomass fuel is derived from either plant oil or animal fat feedstocks
 - Potential to reduce lifecycle greenhouse gasses (joint FAA/DoE/EPA studies underway)
- Flew A-10 Thunderbolt II on HRJ fuel blend
 - First-ever flight of an aircraft powered solely on a biomass-derived jet fuel blend
- Future HRJ certification flight tests of the F-15 Eagle, F-22 Raptor, and C-17 Globemaster scheduled to begin in summer 2010



“Now, the Pentagon isn’t seeking these alternative fuels just to protect our environment; they’re pursuing these homegrown energy sources to protect our national security.”
-President Obama, 31 March 2010



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Increase Supply: Encroachment Issues

- **As traditional development opportunities are reduced private land owners are looking at renewable energy development as an attractive way to make some money**
- **Have seen tremendous increase in the number of energy projects having a potential adverse impact on military operations**
- **No national system exists for energy developers to coordinate projects early development process**
 - **Result - developers may invest considerable capital in project only to have DoD or AF raise concerns at late stage**
 - **AF cannot control whether projects are built, but have an opportunity to voice concerns if given enough notice**

24-26 August 2010

AF-led meeting in Las Vegas to develop the way ahead to create a compatible environment between mission and energy projects



Increase Supply: Renewable Energy Credits

- Renewable Energy Credits (RECs) are used above and beyond what renewable energy (RE) the AF produces to meet RE goals
- Approximately 5% of the AF's total electricity consumed is from RE sources. Without RECs—
 - Renewable energy market would be too expensive
 - Energy from RE sources would be about 1% from on-site generation and about 1% from locations where RE can be purchased directly from the producer
- Multiple types of RECS
 - Bundled RECs: power and RECs are tied to each other
 - Replacement RECs: AF buys the power from a on-base RE producer but does not buy the RECs
 - Unbundled RECs: AF must produce or purchase



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Change the Culture: Focus Area Initiatives

- Conducted Air Force Energy Forums to provide venue for industry, sister services, and other stakeholders to share energy best practices
 - Previous Events: March 2007 and March 2008
 - Recent Forum : 27-28 May 2010
- Included energy awareness education in curricula at Air University and USAFA
- Conducting culture change and outreach activities through conferences, forums and social media
- Incorporating energy as a more realistic element in war games
 - Past: GovEnergy's Energy Security game (Aug 09); Air Force Title X Futures Game (Oct 09)
 - Future: Unified Engagement Game (2010)





- **Quadrennial Defense Review Report, Feb 10**
 - “...means having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs.”
- **Defense Planning Guidance - Undersecretary of Defense (AT&L) in coordination with CJCS will**
 - “...support development of analytic tools, analysis of operational energy issues, and implementation of integrated solutions to operational energy challenges”
- **Developing strategy**
 - Partnering with OSD for way forward
 - Assured access to reliable supplies of energy
 - Ability to protect/deliver energy to meet operational needs
- **Task at hand is to assess and mitigate risk at facilities**

Need Integrated, Enterprise Approach to Identify Mission Critical Facilities



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Energy Security: Operational Energy

- Pursuing ways to assure energy is available by increasing:
 - Reliability
 - Security
 - Accessibility
- Operational Energy
 - Energy required for training, moving, and sustaining military forces and weapons platforms
 - Enterprise-wide issue
 - Fully Burdened Cost of Fuel

Energy Security...means having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs.

**- 2010 Quadrennial
Defense Review**

***It is critical to assure there is available energy today
and sustainable energy in the future***



- **Energy is a force multiplier**
- **Implementing multiple technical and procedural efforts to reduce the demand for energy**
- **Expanding our ability to use alternative aviation fuel to reduce demand on foreign oil and ensure the availability of supply, while remaining good environmental stewards**
- **Working to change the mindsets of all Airmen to ensure energy is a consideration in everything they do**

Senior Leader Focus and Commitment is Imperative



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