

Det-1, Air Force Civil Engineer Center

Engineering Agile Combat Support Worldwide

Air Force Facility Energy Program



Ken Gray, PE
Energy Rates and Renewables Div Chief
AFCEC

1 Nov 12

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Overview



- **Air Force Civil Engineer Center**
- **Energy Directorate Mission, Organization**
- **Roadmap to Operational Capability**
- **AF Energy Governance and Key Metrics**
- **Facility Energy Bottom Line**
- **Divisions' Programs**



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AFCEC
Mission



The mission of the Air Force Civil Engineer Center is to provide ready engineers, engineering and real property solutions and emergency response services that enable sustainable, highly effective power projection platforms to support the warfighter.

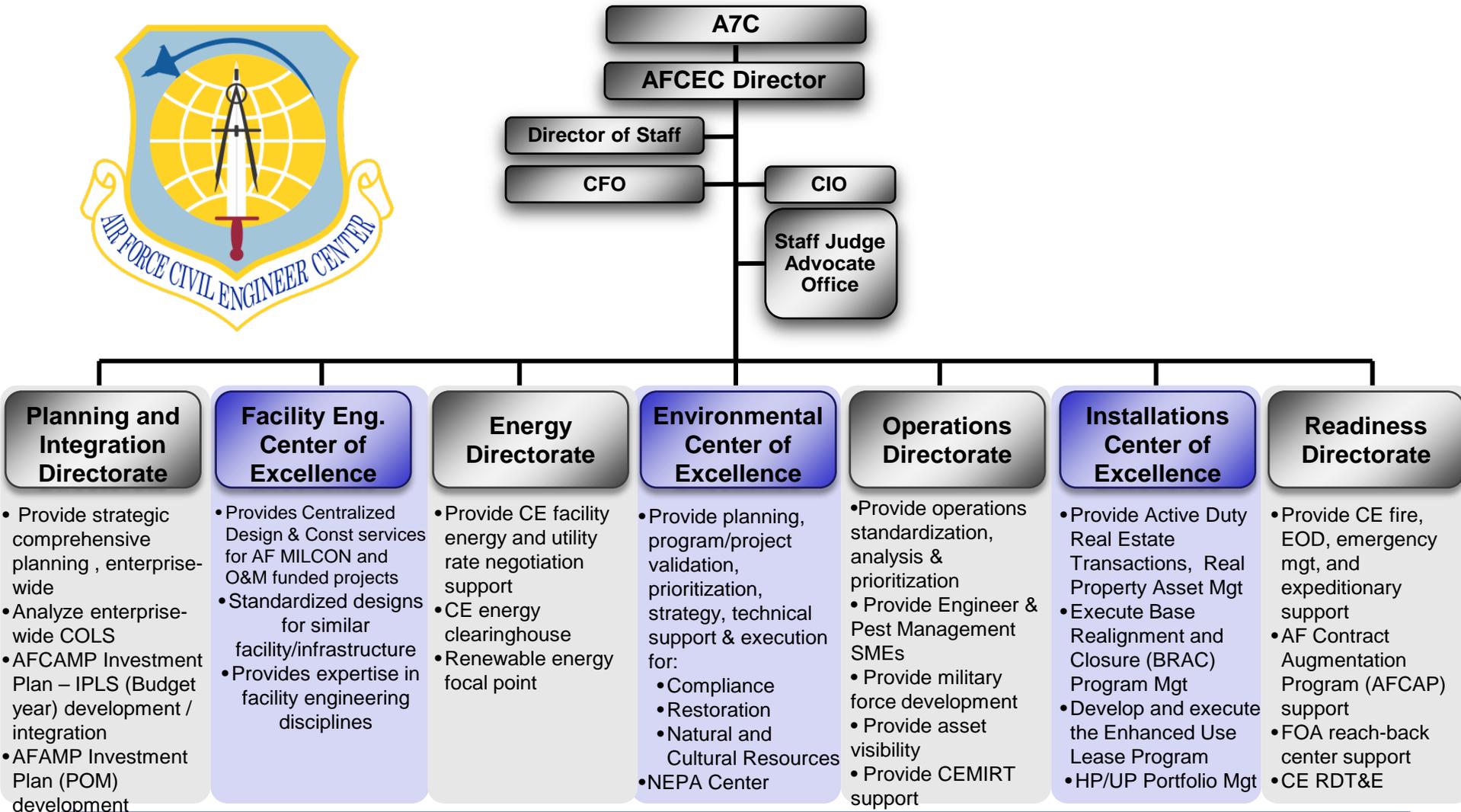


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AFCEC Organization



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Energy Directorate Mission



- *Provide expert support to Air Force installations and Major Commands, and centrally manage Air Force Facility Energy and Utilities Privatization programs in order to comply with all applicable Executive, Legislative, and Agency policies and directives related to facilities energy and utilities privatization*
- **Implement the Air Force Energy Master Strategy**
 - Drive down facility energy/water use through cost-effective conservation initiatives
 - Increase use/production of Renewable Energy by advocating for and facilitating third-party investments
 - Change the culture to ensure all Airmen "Make energy a consideration in all we do!"
 - Utilities Privatization – where/when feasible



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Energy Directorate AFCEC-East



Energy Directorate
Rick Stacey

AFLOA Utilities
Litigation Team
(ULT)
LtCol Gregory Fike

Administrative
Assistant

Workflow

- Litigation
- Rate intervention
- Proj devel support

Performance Measurement and Analysis Division
Ken Walters

- Data collection
- Reporting
- Metering
- REMs

Program Development Division
Mike Rits

- ESPC/UESC
- SRM/NRG Inv
- ECIP
- Energy Init
- Audits (SIAs)

Program Execution Division
Ken Gleason

- Contract Support
- Legacy Projects
- Energy Projects

Rates/Renewables Division
Ken Gray

- RE proj devel
- Rate support

Utilities Privatization Division
Nancy Coleal, Acting

- Privatize Utilities

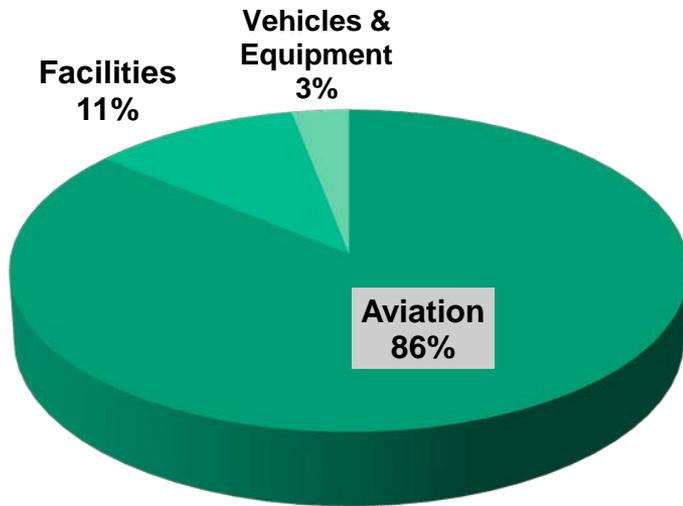


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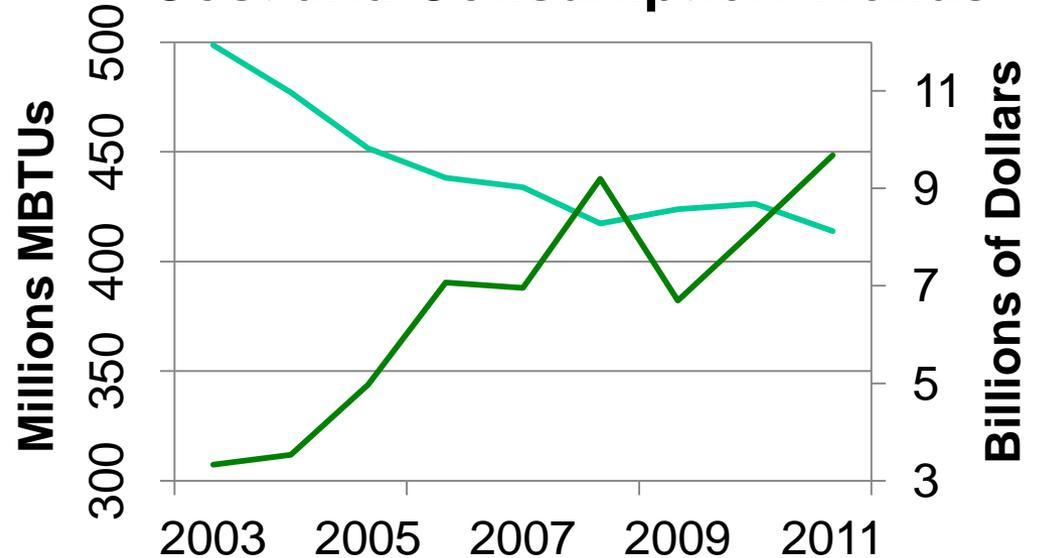
How much did the Air Force spend on energy in FY 2011



Cost Breakdown



Cost and Consumption Trends



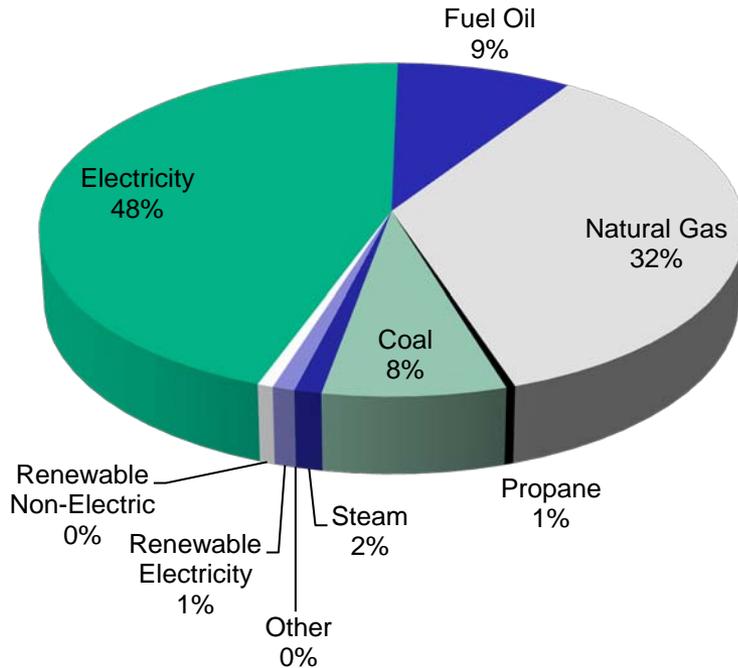
MBTU = Millions British Thermal Units

The Air Force spent over \$9 billion for energy in FY2011

FY11 Air Force Facility Energy Use/Cost



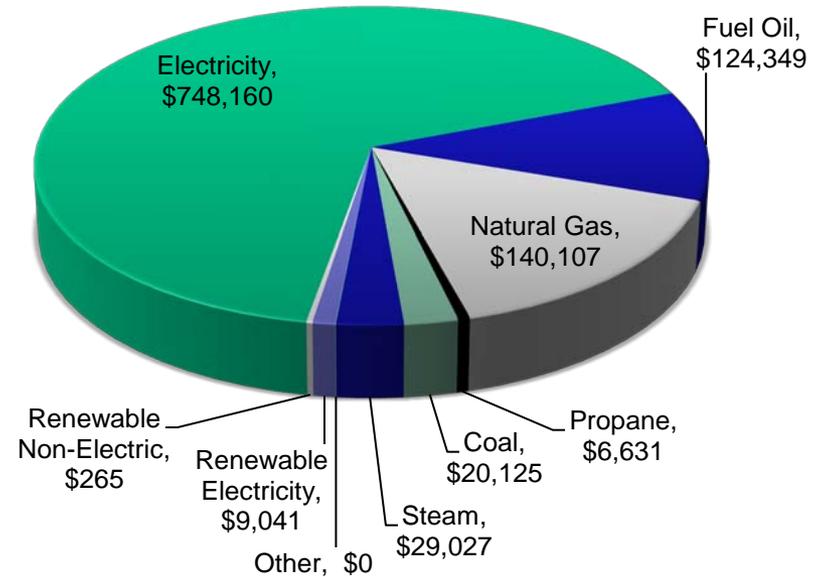
FY11 ENERGY USE



64,486.55 BBTU

65,880.75 BBTU in FY10
2.1% Decrease From FY10

FY11 ENERGY COST (\$000)



\$1,077,705.29

\$1,034,809.96 in FY10
4.1% increase From FY10

Usage & costs include goal-subject, excluded, and renewables (everything that crosses the fenceline)



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Facility Energy Goals and Mandates



Goal Title	Driver	Baseline (FY)	Annual Target	Final Goal	Goal (FY)
Reduce Energy Intensity	EISA 07	2003	3%	30%	2015
Reduce Energy Intensity	EO 13514	2015	1.5%	37.5%	2020
Reduce Greenhouse Gases	EO 13514	2008	3%	34%	2015
Renewable Energy Use	EPAAct 05	2005	5%	7.5%	2013
Renewable Energy Use	*10 USC 2911	2009	**1.0%	25%	2025
On-Base Renewable Energy	AF	2008	--	1%	2012
Reduce Water Use	EO 13423	2007	2%	16%	2015
Reduce Industrial Water Use	EO 13514	2010	2%	26%	2020
Audit Covered Facilities	EISA 07	2009	25%	100%	2012
Meter Facilities (elec)	EPAAct 05	2008	--	100%	2012
Meter Facilities (gas/steam)	EISA 07	2008	--	100%	2016

EISA 07 = Energy Independence and Security Act of 2007

EPAAct 05 = Energy Policy Act of 2005

EO = Executive Order

*NDAA 09 Codified as 10 USC 2911

**FY10 Goal=10%; 1% added per yr – FY11-25

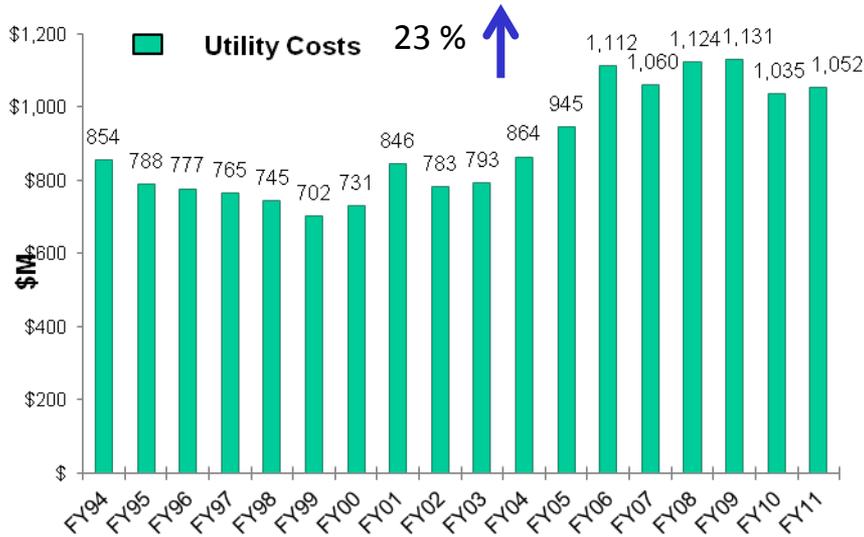
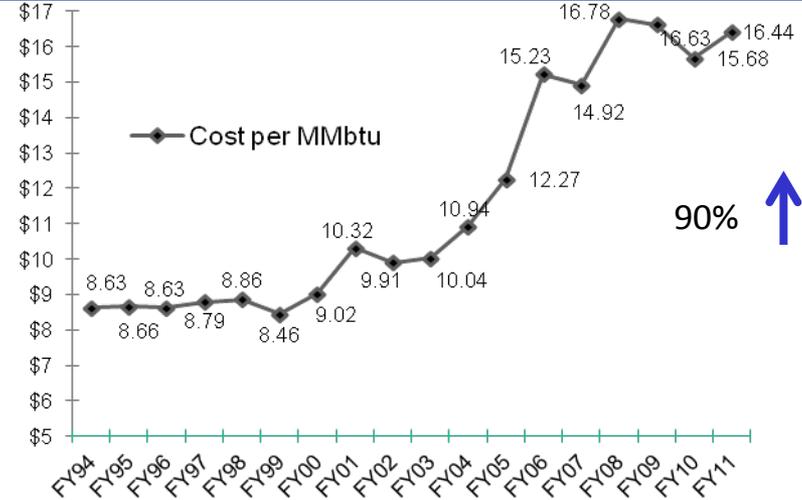
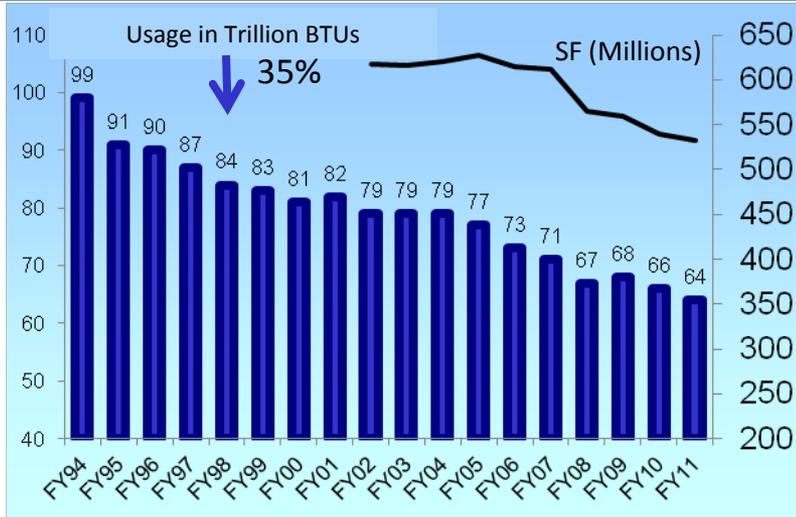
10 USC 2911 = Title 10, US Code - Sect 2911



Facility Energy Cost Trend



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- Over the last 17 years:**
- AF Utility Costs creep upward:**
- 35% consumption reduction does not overcome 90% unit cost increase
 - 35% consumption reduction translates to \$575M AF cost avoidance in FY11

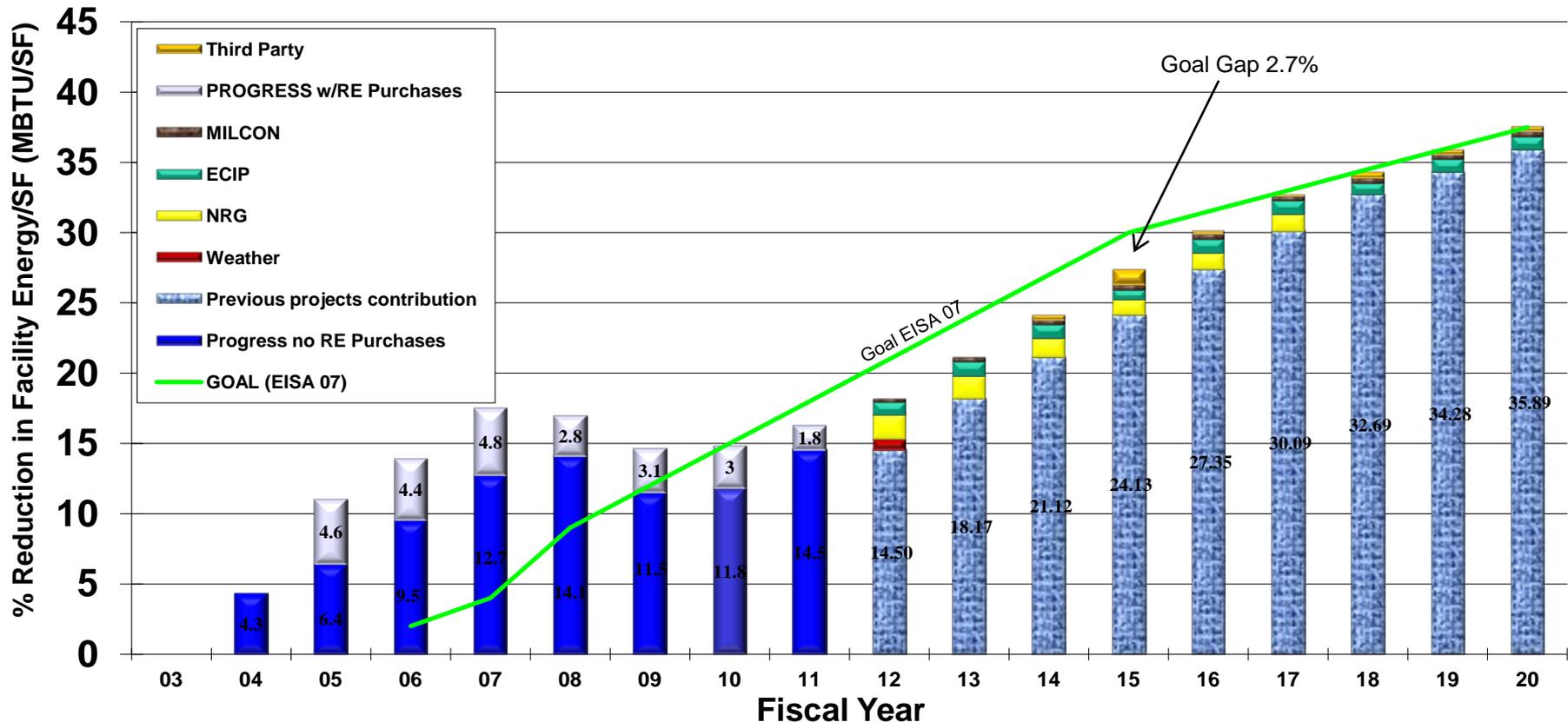


Energy Intensity

Updated 21 Sep 12



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- No renewable energy benefits to intensity metric as it is phased to zero in 2012
- Weather adjustment of 0.8% show in FY12, as FY11 was more severe than the 2003 baseline year
- FY15 “goal gap” translates to ≈ \$270M investment shortfall.

Mandate – Reduce energy intensity 3%/year through 2015; 1.5%/year 2016-2020

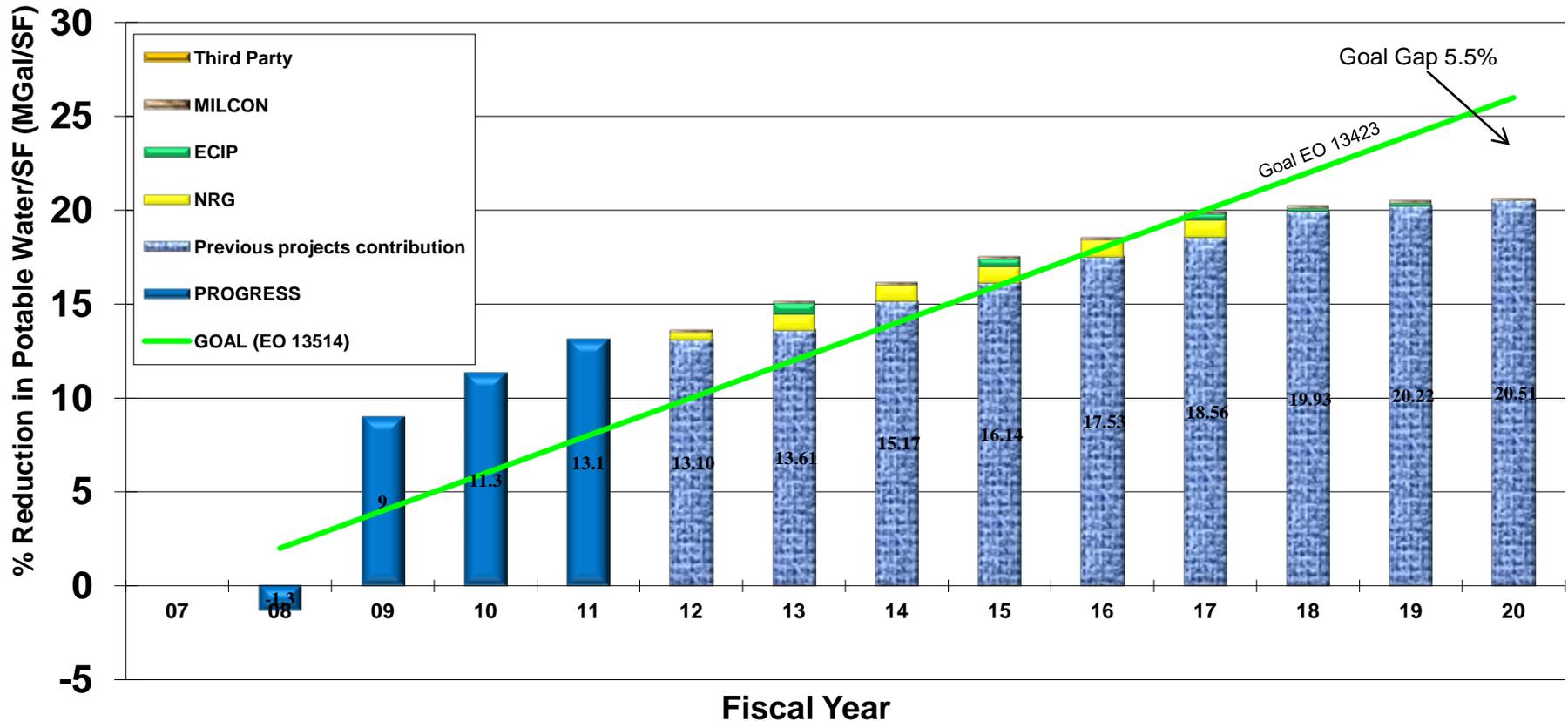


Potable Water Intensity

Updated 21 Sep 12



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- Xeriscaping and fixture projects have made large impacts over the past few years
- Recommend compiling a few more years of “actuals” before making new investment decisions
- Pipeline projects maintain forward progress over the FYDP

Mandate – Reduce potable water intensity 2%/year through 2020

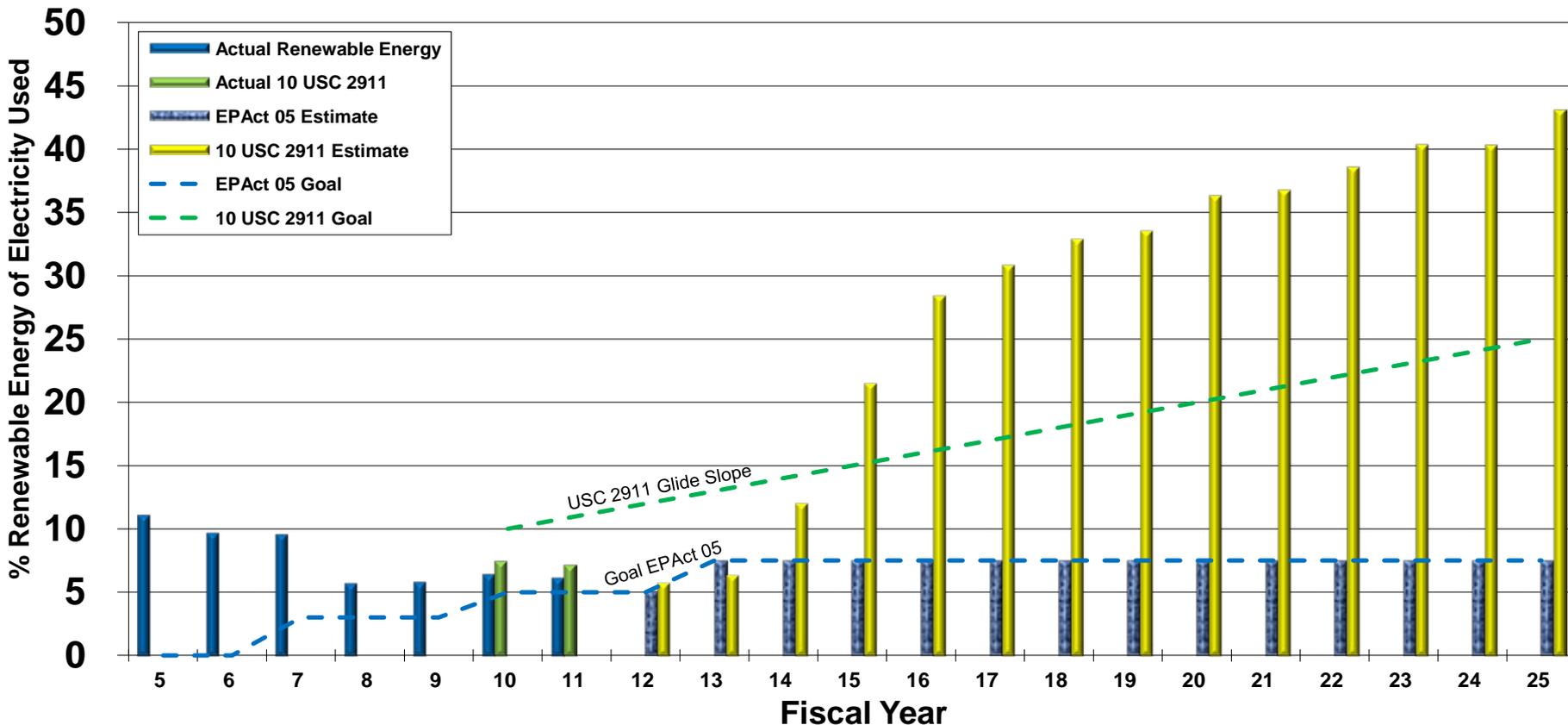


Renewable Energy

Updated 1 Oct 12



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Mandate –EPA Act 05: 7.5% by FY13, 10 USC 2911: 25% by FY25



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MAJOR FOCUS AREAS

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AMRS Contract



- **Objective** - Procure a standardized AMRS solution for the Air Force to manage electricity, water, steam, and natural gas meter data; and capable of pushing limited information to higher-level IT systems
 - Base level implementation
 - Commercial-of-the shelf(COTS) Solution
 - Interface w/various AF compliant meters and EMCS's
 - Support future interoperability – initial deployment is “stand-alone”
- **Driven by EAct 05, EISA 2007, DODI 4170.11 and A7C policies**
- **80 AMRS Installs scheduled; 40 per fiscal year**
 - FY13 is CONUS focused; FY14 overseas locations
 - Installs will use either Wireless or VLAN Configuration
 - Contract includes: Site Survey, Design, Implementation, Commissioning, Training, & Warranty (1-year parts/4 yr tech spt)
 - Contract awarded to Benchmark on 5 Sep 12



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20/20 by 2020



AF Leadership Focus on Efficiency



20/20 by 2020 Goals:

- **20% net reduction in AF physical plant by 2020**
- **20% reduction in operating cost for remaining portfolio by 2020**
- **FY13 MILCON program to achieve 20% net reduction**
- **Invest in reuse of existing facilities before new construction**



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC

FEB 14 2011

MEMORANDUM FOR ALMAJCOM-FOA-DRU/CC

FROM: HQ USAF/CV
1670 Air Force Pentagon
Washington, DC 20330-1670

SUBJECT: Sustainable Installations and Air Force 20/20 by 2020

On 10 Jun 10, President Obama signed a memorandum to all federal agencies charging them to dispose of unneeded real estate, with a focus on utilizing installations more efficiently by optimizing facility-space use, reducing energy/water operating costs, and sustaining only those facilities needed to conduct the mission. In concert, AFPD 32-10 mandates an asset management approach to efficiently allocate our limited funds between valid competing needs.

We intend to meet the President's challenge by leveraging our existing Air Force initiative "20/20 by 2020," which aims to reduce owned, leased, and Air Force-led joint base real property and associated operating costs 20 percent by the year 2020. One pillar of this initiative involves consolidating our operations into the right-sized facilities and demolishing those that fail to meet space utilization criteria outlined in AFH 32-1084. To support this pillar and the President's direction, we are adopting an approach that favors investment in reuse of existing facilities for 'new mission' and 'realignment' over new construction. Effective in the FY13 program, all MILCON must conform to the goal of a net 20 percent reduction of real property across the Air Force portfolio. This approach will not only reduce sustainment investment, but will also reduce operational costs and help us achieve our energy/water conservation goals.

I have directed AF/A7C to provide integrated policy, guidance, and targets to assist MAJCOMs with facility optimization to include space utilization, energy/water conservation, and asset condition standards. Please give this matter your personal attention to ensure that these issues and concepts are understood and implemented across your organizations and installations. For additional information, please contact Colonel Stephen Wood, AF/A7CA at DSN 664-0650.

PHILIP M. BREEDLOVE
General, USAF
Vice Chief of Staff

SIA's Help Identify Opportunities for Efficiency - Consolidate/Demo



SIAs will make a difference!



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SIA's Combined Assessments



- Capture the efficiency created by combining RP Audits, Energy Audits, Facility Condition Assessments (FCA), Space Utilization and HPSB (High Performing Sustainable Building) surveys
- Based on PACAF ECO (Energy/Condition/Optimization) model
- Advantages to combined assessments
 - Right projects for Energy Audits - Reduce future SRM
 - Reduced inspection footprint at base
 - Reduced cost vs. performing assessments individually
 - ID opportunities for consolidation / demo / efficiencies



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FY12/13 Sustainable Infrastructure Assessments



■ **Six SIA Product Lines (in priority):**

- **Real Property Inventory Validation**
- **Real Property Installed Equipment Inventory**
- **Space Utilization: updated/new S-file data set**
- **Energy Audit Report (level II)**
- **High Performance Sustainable Building checklist**
- **Facility Condition Assessments, data stored in “Builder”**

■ **Corps of Engineers Ft Worth District execution**

- **Seven regional AE task orders with COE expert oversight**
- **Expanded training for “Builder” for BCE during Installation visits**
- **Kickoff: JBSA (Randolph) – 3 Dec 2012**
- **Next 61 Installations to be scheduled CY13/14 by AFCEC/CND**
- **Contract options ready to award for all other Installations**
- **ECD: Dec 2014**



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Third Party Financing



- **Energy Savings Performance Contracts (ESPC)**
 - Performed by an Energy Service Company (ESCO)
- **Utility Energy Service Contracts (UESC)**
 - Performed by a utility provider
- **ESPC/UESC characteristics**
 - Contracting vehicles that leverage 3rd party funds
 - Identify and implement energy saving measures
 - Financed with appropriated funds or energy cost savings
 - Term of up to 25-years



Renewable Technologies



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- Solar
- Wind
- Landfill Gas
- Hydropower
- Ground Source Heat Pumps
- Waste to Energy
- Biomass
- Geothermal
- Ocean





PV/Wind

- Intermittent
- Low environ impact
- Power stability issues
- Positive cost benefits

Energy Security

- Technology developing

Biomass/WTE

- Continuous
- Complex environ issues
- Strong power stability



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Emerging Challenges



- **Air Force 1 GW (1,000 MW) RE by 2016**
 - Stretch goal along with Army, Navy
 - Extremely challenging growth required
 - Process workshops to improve process

- **Air Force Net Zero Policy for Energy, Water, Waste**
 - Coordination and synergism of individual programs
 - Net Zero based on one year total consumption
 - No additional funding
 - Implementation Plan under draft



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Facilities Energy Program Bottom Line



■ Infrastructure Energy Strategy

- Meet Mandates (statutory, Executive Order, Air Force, *reporting!*)
- *Invest to avoid future costs → better than 2:1 return on investment*
- Improve mission support with more reliable infrastructure

■ Facility Energy Program Funding

- *Energy Initiative, Focus Funds, Energy Conservation Investment Program: \$300M/yr*
- *Renewable Energy Power Purchase Agreements: \$400M → (120 MW); Enhanced Use Leases: \$3B → (1,000 MW)*
- *Energy Savings Performance Contract / Utility Energy Service Contract: \$200M (growing; remember we're financing!)*

■ Highly dynamic program

- Energy surfacing at all levels of DoD and Federal Government
- Evolving requirements, new technologies, and 'force structure' changes



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BLUF



Sustainable Infrastructure Assessments (SIA)

FY-12 SIA 2 - Six product lines

- **Real Property Review: additions/deletions/ DD1354**
- **Space Utilization: complete S-file population**
- **Real Property Installed Equipment**
- **Energy Audits (levels 1,2,3)**
- **High Performance Sustainable Building (HPSB) Survey**
- **Facility Condition Assessment**

History

- **2008 AFCESA Nuclear related facilities condition assessments**
- **2009 PACAF Facility Condition Assess, RPIE; eComet**
- **2009 Energy Audits by individual Installations**
- **2010 Centralized Energy Audits**
- **2010 Centralized Space Utilization Contracts**
- **2011 SIA 1: Energy Centric Combined Assessments**
 - **Energy Audits, HPSB, FCA, Space, RPIE**