

Joint United States Army & United States Air Force

RENEWABLE ENERGY Industry Day

June 12, 2012 Crystal Gateway Marriott | Arlington, VA

www.upcomingevents.ctc.com

Next : USAF Renewable Energy



Headquarters U.S. Air Force

Integrity - Service - Excellence

Renewable Energy Program



**Lt Col Paul Silas
HQ AF Energy Branch**

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Overview



- **The Scale of the USAF Energy Effort**
- **Goals and Mandates**
- **Air Force Strategy**
- **Renewable Energy Project Criteria**
- **RE Opportunities**



Physical Plant Profile



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Family Housing



75,800 Homes
Arlington/Alexandria
Combined

Air Force Installations



10M Acres of Land
Twice the size of
New Jersey



Plant Replacement Value

\$255B PRV
Nearly the GDP of Peru

Airfields



102 Million Square Yards
152 x DFW Airport

Facilities



626M Sq Ft of Buildings
88 x Microsoft Corporation
1.5 x GM

Dormitories



69,500 Dorm Rooms
1 1/2 times Doubletree Hotels

Every asset needs energy



Facility Energy in Scale



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Category	FY 2010		FY 2011	
	Cost	% of Energy	Cost	% of Energy
Aviation	\$6.8B	83%	\$8.3B	86%
Installations	\$1.1B	13%	\$1.1B	11 %
Vehicles	\$0.309B	4%	\$0.322B	3%
TOTAL Energy:	\$8.2B	7.1% of AF Budget	\$9.7B	8.4% of AF Budget

Total Blue Budget: \$115B (2011) and \$115B (2012)

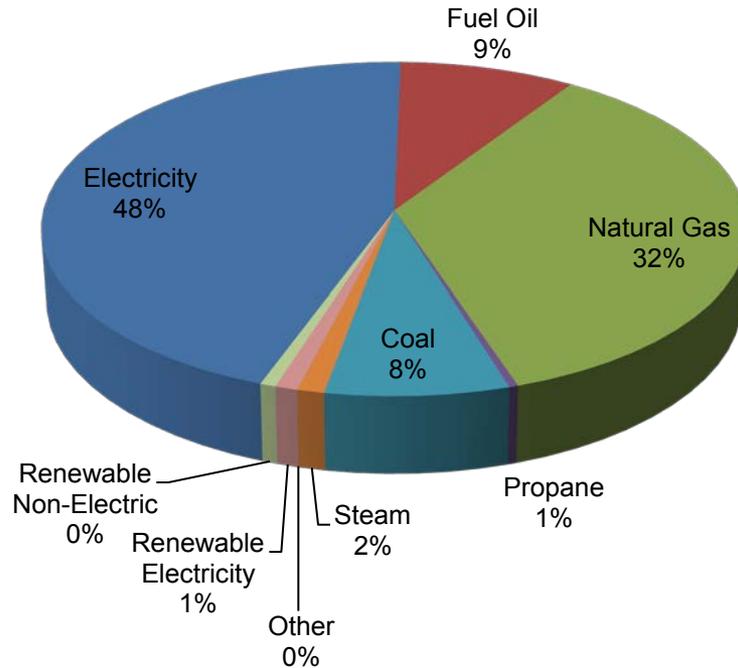


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Facility Energy Use/Cost



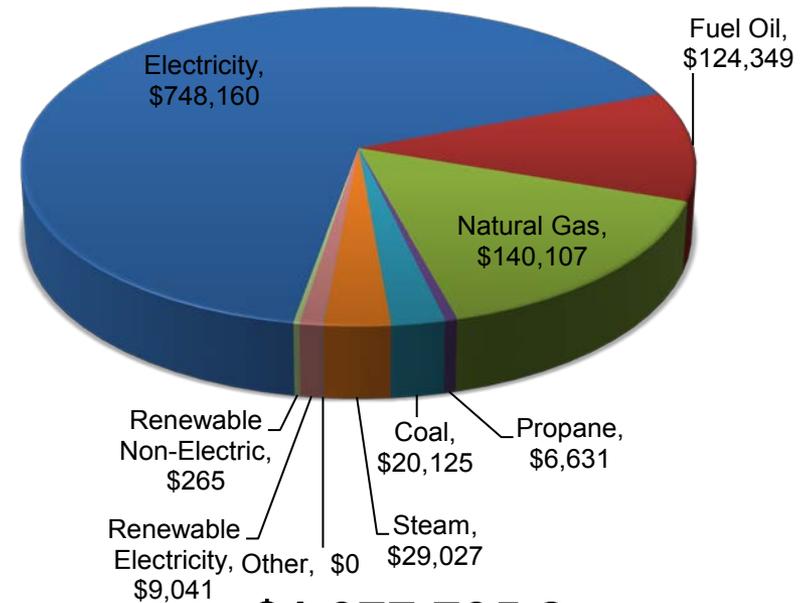
FY11 ENERGY USE



64,486.55 BBTU

65,880.75 BBTU in FY10
2.1% Decrease From FY10

FY11 ENERGY COST (\$000)



\$1,077,705.2

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

SOURCE: FY11 ANNUAL ENERGY MANAGEMENT REPORT TO CONGRESS



Infrastructure Energy Goals and Mandates



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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

*NDAA 09 Codified as 10 USC 2911

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

EPAAct 05 = Energy Policy Act of 2005

EO = Executive Order

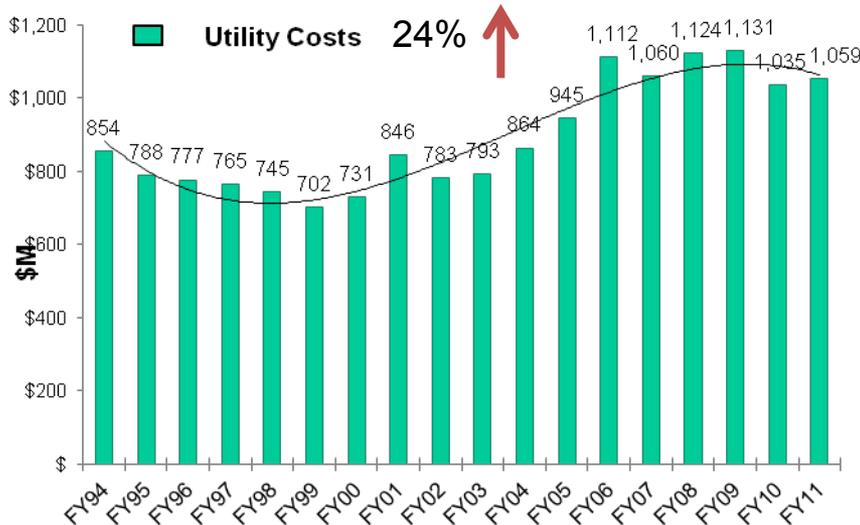
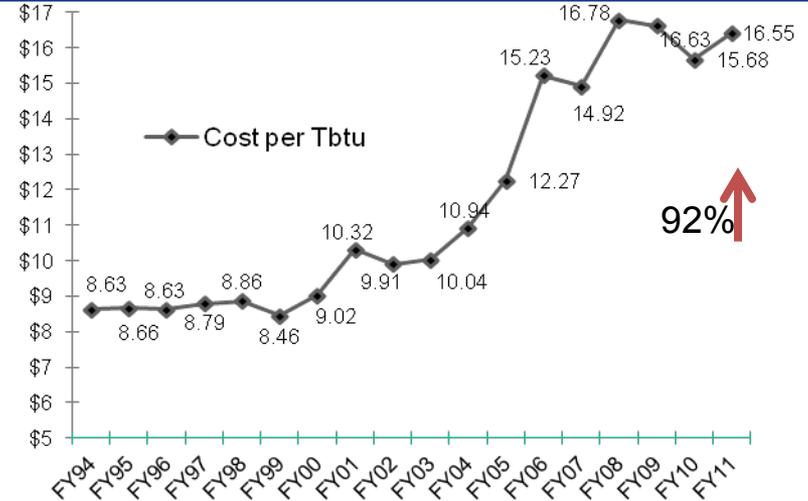
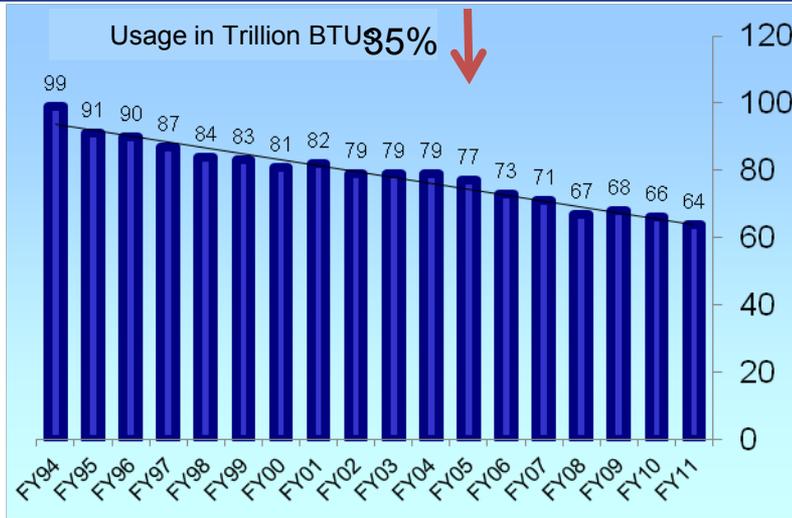
10 USC 2911 = Title 10, US Code - Sect 2911



Facility Energy Cost Trend



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Over the last 17 years:

AF Utility Costs creep upward:

- **35% consumption reduction does not overcome 92% unit cost increase**
- **35% consumption reduction translates to \$579M cost avoidance in FY11**
- **FY11 data not yet final with FEMP**

\$2.5B in Cost Avoidance across FYDP = 16 F-35s



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AF Facility Energy Strategy



- *Reduce demand, increase supply and change culture*
- **Make smart investments in reliable infrastructure to build sustainable installations**
 - Direct energy project funding; seek best ROI w/ every \$
 - Maximize funding sources: ECIP, NRG, other
- **Multiply return by leveraging third party funding**
 - Power Purchase Agreements (PPAs)
 - Enhanced Use Leases (EUL)
 - Energy Savings Performance Contracts (ESPCs)
 - Utility Energy Services Contracts (UESCs)



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Renewable Energy Goals and Strategy



- **First Priority: Develop on-site renewable resources**
 - Renewable Energy Power Purchase Agreements (REPPAs) or Enhanced Use Lease (EUL)
 - Utility/Third Party Funded
 - Direct AF investment (limited)
- **Second Priority: Procure power from off-site renewable resources delivered over the power grid**
- **Third Priority: Purchase Renewable Energy Certificates (RECs)**
 - Replacement RECs
 - Goal Attainment (phasing out in 2013)

PROGRAM ON TRACK TO ATTAIN ALL RENEWABLE GOALS



Renewable Technologies



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



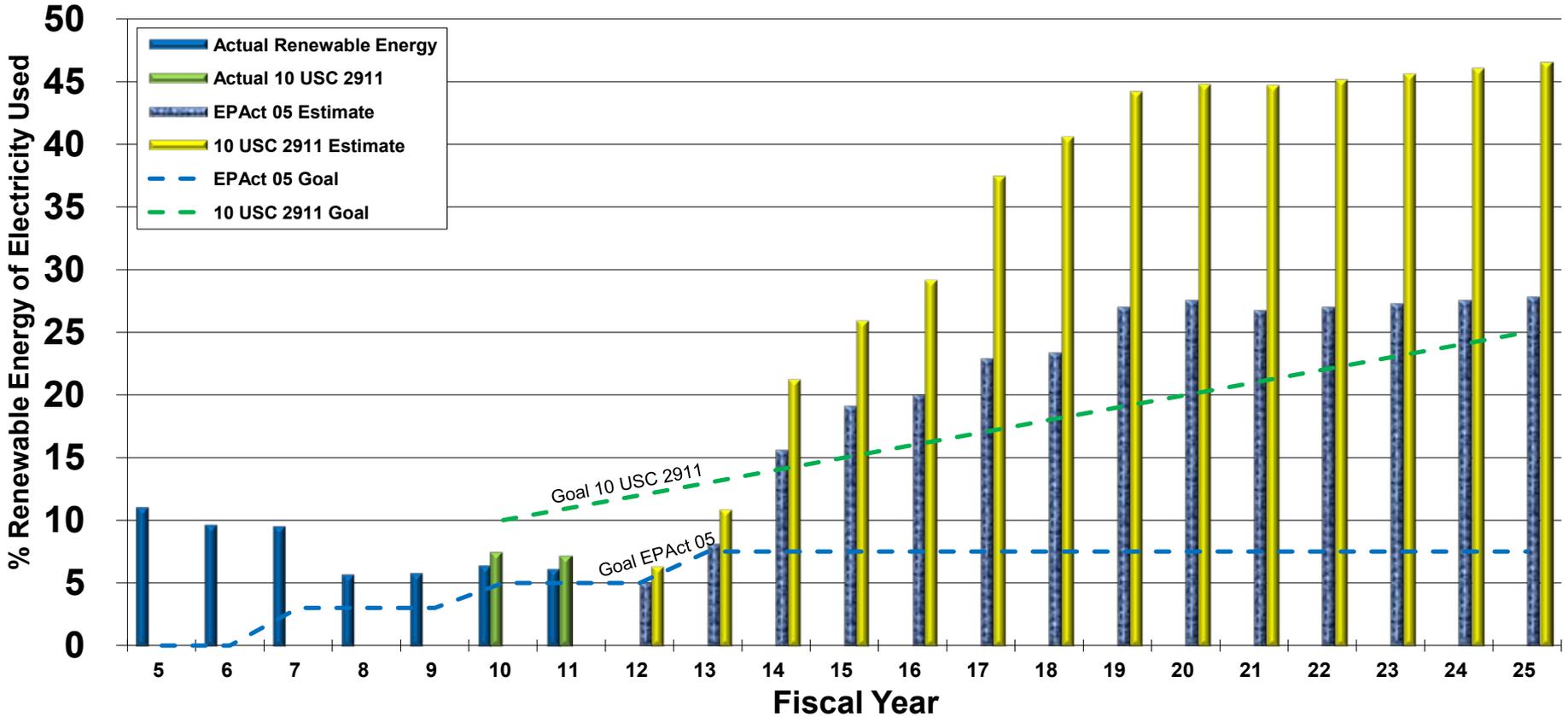


Renewable Energy

Updated 09 Mar 12



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- Operating & Under Construction 181 RE projects on 77 bases including ANG in FY11
- Concentrate on development of on-base renewable projects using REPPA contracts
- AF RE Game Plan projects additional 650 MW capacity by FY16

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



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On-Base Renewable Electricity Generation (Top Ten)



Location	Source	Generation MWH
Nellis AFB, NV	Solar Photovoltaic	31,477
Hill AFB, UT	Landfill Gas	14,949
F E Warren AFB, WY	Wind	8,725
Ascension Island	Wind	7,095
US AF Academy, CO	Solar Photovoltaic	6,631
Buckley AFB, CO	Solar Photovoltaic	1,545
Cape Cod AFS, MA	Wind	1,472
Toledo ANG, OH	Solar Photovoltaic	1,203
Fresno ANG, CA	Solar Photovoltaic	942
JB McGuire/Dix/Lakehurst, NJ	Solar Photovoltaic	738

Air Force Totals

56 Bases

131 RE Projects

54 MW

79,106 MWH

The Air Force supported 79,106 MWH of renewable energy in FY 11. This is the equivalent to removing 10,700 cars from the road or enough energy to power Ellsworth AFB for 1 year



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RE Project Evolution

Getting to 1000 MW—Inception to Production



Potential may be huge

❖ Go/No-go points

“RE idea universe”

RE studies, base staff, MAJCOM staff, private developers, SLs, FOA, academia, industry, etc.

❖ **Prelim Concept/ Opportunities**

300 MW
Prelim Concept

Govt Validation

- ❖ Feasibility
- ❖ Opportunity
- ❖ Business Case

300 MW
Advanced
Concept

❖ **Develop**
(EUL, PPA)

Build plant

Produce

708 MW in
Development

54 MW current
Production

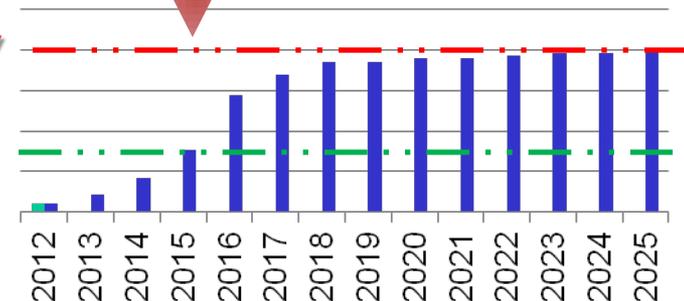
Govt Validation

- ❖ **Feasibility**
Look at RE types (wind, solar, biomass, etc.), util rates
- ❖ **Opportunity Assessment**
Identify base requirements, scope of opportunity, assess potential mission impacts, environmental issues, etc.
- ❖ **Business Case**
Crunch the numbers for specific project details (cost, method of execution, payback, etc.)

> 950 MW
by 2020

1000 MW

10USC2911





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Selection Considerations

Large RE Projects (> 500 KW)



<p>PPA</p> <p>OPR AFCESA</p> <p>(FOA Tyndall)</p>	<p><u>Selection Factors</u></p> <ul style="list-style-type: none"> - Utility cost savings over life cycle exceeds real estate value - Base able to use all of power produced by project - Project capacity less than or equal to ‘base load’ <p><u>Characteristics</u></p> <ul style="list-style-type: none"> - Utility Purchase Contract (w/ real estate component) - Energy purchased and used by Base - Counts for 10 USC 2911 and counts “double” for EPACT 05 goals - Counts toward Greenhouse Gas reduction and energy security
<p>EUL</p> <p>OPR AFRPA</p> <p>(FOA San Antonio)</p>	<p><u>Selection Factors</u></p> <ul style="list-style-type: none"> - Project value must meet Fair Market Value - Base may/may not use power generated--project capacity exceeds base load (goal: combined EUL/PPA) - Develop Selection Factors (Concept, Capability/Experience, Value to AF) <p><u>Characteristics</u></p> <ul style="list-style-type: none"> - A real estate transaction: energy sold to market - OSD allows counting for 10 USC 2911; no credit to EPACT 05 - Cash or In Kind Consideration (IKC) required; assists energy goals (e.g., Travis Solar EUL DoD Cert)



PPA Execution Timeline



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- **Opportunity Identification (~120 Calendar Days)**
 - **Base Siting & Coordination, MAJCOM Review Endorsement, Mission Review and Encroachment Review**
- **Project Development (~180 Calendar Days)**
 - **Land Valuation, Interconnection Development, Privatization ESG, Strategic Basing Approval, EMWG, RFP & Lease Development, NEPA Review**
- **Project Acquisition (~200 Calendar Days)**
 - **OSD Certification, Authority Approval, Advertise, Receive and Evaluate Proposals, Award and Lease Signature**
- ***'Optimally' ~ 17 months***

All PPA projects are unique and require an individualized project schedule



EUL Execution Timeline



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- **Opportunity Identification (~90 Calendar Days)**
 - **Market analysis, land availability, site visit, non-excess & mission compatibility letters, begin EBS/EIAP, establish Deal Team (AFRPA, Base, MAJCOM, SAF/GCN)**
- **Project Definition (~87 Calendar Days)**
 - **DoD Certification, Fair Market Value determination, Privatization ESG approval, Strategic Basing approval, Congressional Notification**
- **Project Acquisition (~199 Calendar Days) (not include time between ATL/Lease)**
 - **Statement of Need, Industry Day, Solicitation, Developer Evaluation & Selection, Negotiations, set up accounts, Congressional Notification, SAF/IEI signs Agreement to Lease/Lease**
- ***'Optimally' ~ 12 months***

All E-EUL projects are unique and require an individualized project schedule



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On the Horizon



■ AFRPA: EUL Pipeline

Energy Source	Projects Total #	Capacity MW
Photovoltaic (PV)	6	560
Natural Gas	3*	TBD

560 MW

■ AFCESA: PPA & Direct AF Investment

Energy Source	Projects Total #	Capacity MW
Photovoltaic (PV)	12	51
Biomass	1	25
Waste to Energy	1	5.4
Wind	6	60
Landfill Gas	1	6.6

148 MW

RE GAME PLAN

**> 650 MW
new capacity
by 2016**

54 MW Existing On Line

* Not RE, In-Kind Consideration could be PPA



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RE Project Development Progress



Three Step Screening Process

- Feasibility Study (FS)
 - High level review—is sufficient RE resource available?
- Opportunity Assessment (OA)
 - 10% Design, Preliminary Economic Review, Mission Conflicts, Environmental Review, Technology Focused
- Business Case Analysis (BCA)
 - *Pencils sharpened for business case analysis*
 - BCA prepared for Senior Leader Endorsement

Step	Studied	Bases	Viable
FS	262	89	129
OA	58	27	13
BCA	13	13	On-going

“Take-away” – 5% feasibility
RE is not ‘automatic’ at most locations



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RFI Response Data



Technology Area	Posted	Closed	Responses	AFRL Referrals	Potential RFP/RFQ
Small Wind < 500 KW	24 Feb 11	30 Mar 11	29	9	5
Geothermal	25 Mar 11	29 Apr 11	17	1	3
Small Solar < 750 KW	8 Apr 11	25 May 11	19	6	1
Large Wind > 500 KW	27 May 11	28 Jun 11	16	2	3
Biomass – Waste to Energy	8 Jul 11	3 Aug 11	23	5	5
Large Solar > 750 KW	1 Sep 11	4 Oct 11	35	5	2
TOTALS			139	28	19



Scorecard - Potential RFPs/RFQs



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Technology Area	Issues	On Hold	In Process	Deferred	Closed	Potential RFP/RFQ
Small Wind < 500 KW	Business Case	1	1	1	2	5
Geothermal	Environ	1	2			3
Small Solar < 750 KW	Business Case			1		1
Large Wind > 500 KW	Business Case		2	1		3
Biomass – Waste to Energy	Environ	1	4			5
Large Solar > 750 KW	Encroach		1	1		2
TOTALS		3	10	4	2	19



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Summary



- **Balance RE efforts with other key energy requirements**
- **Detailed evaluation process**
- **650MW by 2016**
- **Air Force goal is 1 GW of RE by 2020**
- **Air Force constantly exploring new RE opportunities**

- Expressions of interest or company bios : Josh Scott at AFCESA-
josh.scott@tyndall.af.mil. (No phone calls)



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Here are some Contracting Specifics from our Air Force Energy Center:

- Contracting is done through the local base contracting**
 - All RFPs are announced on FEDBIZOPs. So PLEASE watch and respond as required in synopsis and other notices.**
 - Contracting Officers remind us constantly: No additional information can be provided by AFCESA or the base, unless submitted through the website. This is so all parties can share the response. CO's are specific: we must prevent any unfair advantage or competitive bias.**
 - Potential providers must complete all requirements to do business with federal government such as, Central Contractor Registry, DUNS, FEDBIZ OPS.**
 - Send no business confidential or sensitive documents by email.**
- This list is not all inclusive but illustrates requirements**

-Expressions of interest or company bios may be sent to Josh Scott at AFCESA- josh.scott@tyndall.af.mil. No phone calls.