Why Renewable Energy

- Federal/Legislative Requirements
- Air Force Requirements
- Rising Utility Costs
- National Security and Energy Independence
- Limited Resources
  - Natural Resources
  - Money
- “It’s the right thing to do“
- Climate Change
ANG Facilities Overview

50MSF Facilities = 12 Malls of America
95.4 K Acres = 22 Andrews AF Bases

- 1,158 Aircraft
- 106,700 People
- $15.3B Plant Value
- 1,604 Support Units
- 88 Wings
- 4 Combat Readiness Training Centers

Footnotes:
- Located in All 50 States, 3 Territories and District of Columbia
  - Total: 177 Locations
- Most Land Leased to the AF and Licensed to the State
- People Excludes Federally Funded State Employees

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Typical ANG Installation

- 20-35 Administrative and Light Industrial Facilities
- 80-110 acres
- Located near a Military or Municipal airfield.
  - Leased property
Renewable Strategic Approach

- Implement renewable wherever feasible
  - Not many ANG locations are suitable
    - Current Utility Rates
    - Geographic/Environmental Conditions and Constraints
    - Physical Limitations
- Purchase Green Power through local utilities.
- Purchase renewable energy credits
Limiting Factors

- Not a large consumer so utility rate structure is typically that of commercial facility
- Not a large consumer so not always desirable for 3rd Party Investors and Developers
- Small campus, not suited for large Ground PV array for generation, often restricted to roof tops systems
- Limited property for 3rd Party Developers
- Federal/State entity, not able to take advantage of tax/depreciation incentives that make projects economically feasible.
- Located on an airfield, have height limitations
PV Projects Implemented

• Operational Photovoltaic Systems
  • Toledo, OH – 1.18 MW, expanding to 1.48 MW
  • Fresno, CA – 660 KW
  • Camp Perry, OH – 188 KW
  • Phoenix, AZ – 16.8 KW
  • St. Joseph, MO – 162 KW
  • New Castle, DE – 180 KW
  • Buckley, CO – 245 KW
TOLEDO PV

- 1.48MW System
- RTD&E Project: 1 - Technology, 2 different configurations
- $13.8M
- Anticipated Annual:
  - Generation: 1,348 MWH
  - Cost Savings: $253,000
  - 38% Installation’s Electric need (yearly)
- Maintenance minimal
  - Quarterly Cleaning
  - Yearly Weed control
  - Quarterly PM Inspection
Toledo PV Configuration
ground array at camp perry

- 188 kw system
- RTD&E project
- Anticipated annual:
  - Generation: 193 MWH
  - Cost savings: $17,000
  - 44% installation needs
Fresno PV-Roof Application

660 KW System

Cost
- $5.6 M

Generation
- 875 MWH/Yr
- Cost Savings- $115,000
- 24% Installation needs

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Other Roof Application

St. Joseph, MO

New Castle, DE

Buckley, CO
Purchasing Renewable Energy

- Installation at Madison, WI purchases 100% Green Power (wind generation)
  - FY10 - 4,003 MWH

- Purchase of Renewable Energy Credit is the cheapest method of obtaining the mandated renewable goals
What would it take for the ANG to achieve 25% renewable Energy?

- 590,000 MWH 2010 ANG Electrical use
- Rooftop PV a viable solution
- 22.5M S.F of roof available
- 367,000 MWH potential, 148,000 MWH required
- $7.5 per watt installed cost
- $1.0B required
Small Scale Wind

- System just being brought online.
- Each Generator estimated to generate 2,500 KWH/Yr.
- Cost $18,000 per Generator
Summary

- Small Installation Challenge
- Funding Challenges
  - ECIP, RDTE, MILCON, O&M
- ANG Policy
  - Construct Efficient Facilities
  - Evaluate all Renewable Energy possibilities and incorporating those that are life cycle cost effective
  - Implementing features into construction projects for future implementation of Renewable Energy
Questions?