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Renewables Assessment for DoD Installations

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Background

- FY 02 MilCon Appropriations Conference Report
  - DoD to assess renewable energy opportunities
  - Address regional volatility, energy shortages, vulnerability of central generation and distribution
  - Increase reliance on renewables (solar, wind, geothermal) at installations and family housing
  - Encourage private sector renewable energy development on or near installations
  - Provide a plan for participation of private industry
  - Address market, regulatory, legal, cost and other impediments to purchasing
  - Analyze overall cost, benefit and risk of various proposals
  - Thorough assessment, 10-15 months, $6M
  - Interim report sent to Congress May 02
  - Second Interim report due Sept 03; final due June 04
  - Added assessments funding in FY 04?

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Lay of the Land

- DoD electricity use/renewables will stay on front burner
  - Started with California energy crisis
  - 911 increased DOD interest in secure on base power
  - 2 years of energy legislation focus on DOD, feds
  - Politically active renewables industry, state economic development interests, bipartisan support
  - Administration renewables initiatives on federal lands,
  - Strong industry interest on base (energy side v. ops)
  - *DoD energy policy highlights renewables (flexibility, diversity)*
- Assessment has larger meaning due to energy legislation
- *What makes sense for the military will drive DoD approach*

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DOD Objectives

- Assessment should “make sense for the military”
  - Must be consistent with installation mission/operations
  - Reduce costs ?
  - Address electric infrastructure security for growing DoD needs
    - Reduce grid/natural gas dependence, vulnerability with on-site renewables
  - Obtain credits toward EO 13123 federal energy goals
  - Obtain air credits in non-attainment areas
  - Identify best installations for renewable energy
  - Satisfy Congress and Administration
  - Improve reliability

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Some Specific Military Benefits

- Reduce grid/natural gas dependence by on-site generation
  - Reduces logistics tail for purchases of electricity or natural gas
- Helps meet conformity requirement in Clean Air Act
  - More flying in CAA non attainment areas
  - May be significant overlap with on-base renewable potential
- Increased privatized on-site power for growing critical uses
  - Serves Homeland Security civilian support?
- "Islanding" power for military bases and adjacent areas with local renewable power
- Links Army/AF tactical use to Installations
  - Overlapping uses of thin film, back-up power

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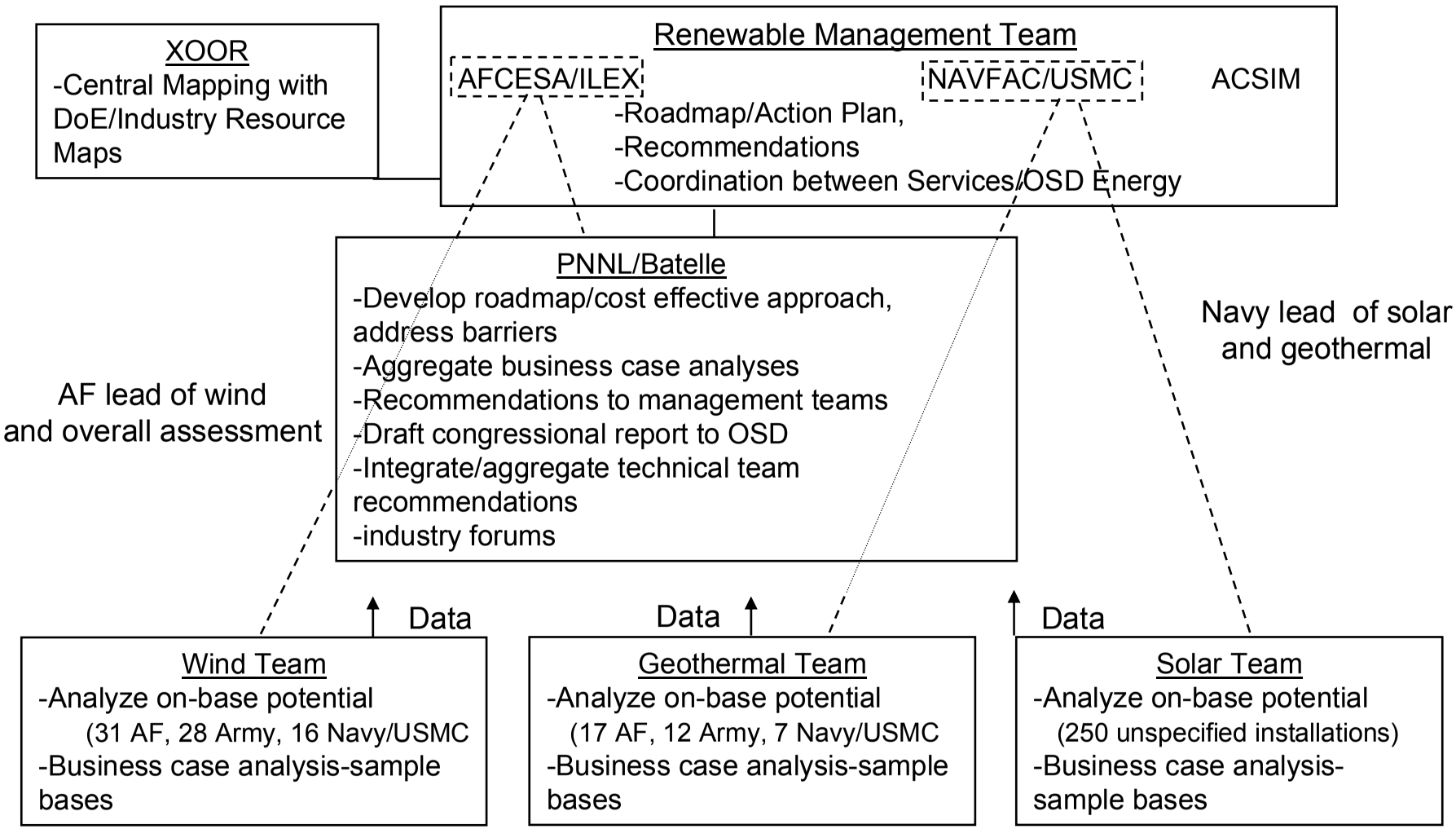
Assessment Team



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Themes

- Mil benes – staying power
- Simplify process – open path thru bureaucracy
- Cross-service coord means more faster
- Partner w/ industry to achieve common goals
  - Barriers (M/L/R/F)
  - Engage industry
  - Program office for staying power, industry liaison
- DOD's portfolio approach
    - Buyer and lessor
    - Multiple sites
    - Develop cross-service regionally
- Security
    - - Premise: Closer to base is more secure
    - - How package on base wind for grid independence
    - - How make regional grids more robust

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On Base Wind Energy Assessment

Windpower 2003
Austin, Texas
May 20, 2003

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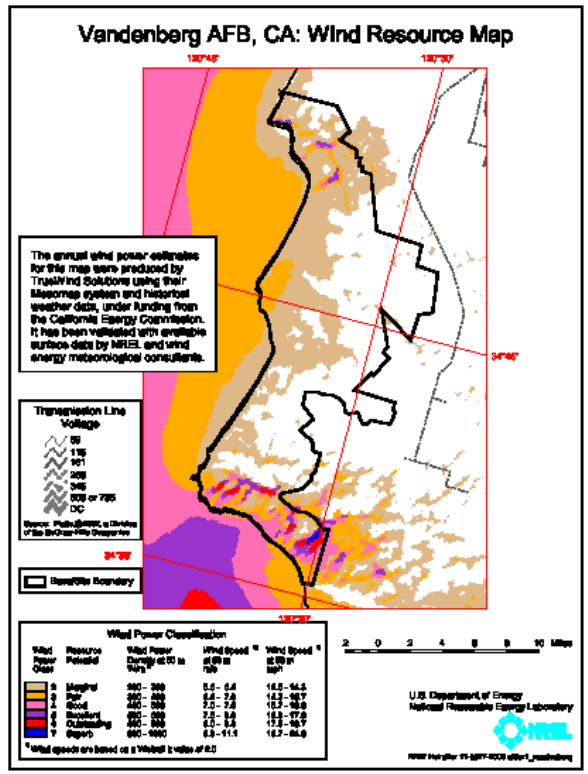
On-Base Wind Energy Assessment

- **Assessment Process**
  - **Over 900 installations from DOD Real Property Inventory**
  - **Multiple screening criteria**
    - **Base size (> 1000 acres)**
    - **Quantity of windy land (Class 3,4,5+)**
    - **Proximity to transmission**
    - **Local electricity costs**
    - **State policies**
    - **Market potential**
  - **NREL performed GIS analysis using high resolution wind maps**
  - **Established short list**



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On-Base Wind Energy Assessment

- Short List and Top Prospects
  - 75 Installations identified as meeting screening criteria
  - Ranked and prioritized short list to identify top prospects
  - Services helped coordinate base level support
  - Performed 39 site assessments since January 2003

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On-Base Wind Energy Assessment

- **Preliminary Conclusions**
  - **400 to 900 MW of wind energy generating potential identified**
  - **20 installations have good development potential**
  - **Individual project sizes ranged from 3 MW to 200 MW**
  - **20 to 60 MW was a common project size range**

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On-Base Wind Energy Assessment

- Unique Challenges
  - 150 foot height restrictions at AFBs
  - Military Operations Areas (MOAs) airspace
  - Small off-base DOD parcels for electronic threat emitters
  - Extensive use of available land for training, maneuvers, simulations
  - Large buffer areas around targets

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On-Base Wind Energy Assessment

- **Next Steps…**
  - **Installation and data collection for up to 20 met towers (spring/summer 2003)**
  - **40 m or 50 m met towers with multiple sensors to be used**
  - **Collect one year of data**
  - **Utilize wind data in business case analysis to evaluate economics**
  - **Evaluate near base potential in collaboration with purchasing strategies**
  - **Final report in summer 2004**

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Air Force Purchases

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Air Force Purchases

Installation	Year	Gwh Purchased
Cannon	*02, 03*	*1.8 Gwh*
Dyess	*02, 03*	*78 Gwh*
Edwards	*01, 02, 03*	*132 Gwh*
Grand Forks	*02, 03*	*1.8 Gwh*
Schriever	*02, 03*	*1.8 Gwh*
Sheppard	*02, 03*	*6.3 Gwh*
F.E. Warren	*02, 03*	*2.2 Gwh*
Minot	*02, 03*	*4.0 Gwh*
Goodfellow	*02, 03*	*2.1 Gwh*
Lackland	*02, 03*	*1.8 Gwh*
Ellsworth	*02, 03*	*2.2 Gwh*
Fairchild	*02, 03*	*7.8 Gwh*
TOTAL		***246 Gwh***

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Renewable Energy Purchasing Strategy

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DOD Goals

- Increase energy flexibility
- Reduce energy budget volatility
- Increase use of renewable energy (EO13123 codified for DOD)
- Create partnership with renewable industry
- Satisfy congressional directives (comprehensive renewables strategy and federal land proposals)
- Enhance energy security (stimulate local development to make grid more robust)

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Benefits to Industry

- Strategic supplier to a creditworthy customer
- Large sales of power on long-term basis (not window dressing)
- Partnership with organization with shared mutual interests:
  - interested in robust power grid,
  - reliable power supplies, and
  - interconnection issues.

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Concepts

- Aggregate purchasing across services in an area/region
- Match contract terms to financial needs of industry (long term vs. short term commodity purchases)
- Time purchases to industry expansion and energy price/choice cycles
- Support transmission additions
- Reduce Ancillary Service costs through regional aggregation/wheeling
- Consolidate points of contact (POCs) in large DOD organization

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Next Steps

- Engage industry in partnership
- Identify industry representatives to work on strategy
  - Aggregation
  - Interconnection/wheeling/ancillary services
  - Standard contracts and procurement
- Sign up sheet at booth and in back of room