

DoD Renewables Assessment Project Status Report – Prelim Results

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Overview

- ▶ Background to project
- ▶ Tell me why
- ▶ What's in it for me (prelim findings)?
 - Potential for geothermal
 - Wind farm potential
 - Solar applications
- ▶ Overview of Energy Security task

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 Oct. 03; final due June 04

Renewables Assessment Process

- ▶ ID installations
- ▶ ID resources on installations
 - What are the “right” technologies? Where is the resource? What will they cost?
 - “Potential” assessed using resource maps, etc.
 - “Prove resources” based on site specific data
 - “Economic resource” documented in project specific Business Case
- ▶ Assess “near-site” resource potential and “green power – NOT tag” market
- ▶ Develop Green Power purchasing strategy
- ▶ 1st Order assessment of energy security value
- ▶ Align DoD energy and security strategies
- ▶ Deliver turnkey projects ready for proposal, prioritized in cooperation with services, for maximum installation benefit
- ▶ Pave way for streamlined laws, regulations, contracting
- ▶ Provide longer term, consistent platform to implement assessment results

Why Should DoD “Do” Renewables?

- ▶ Reduce grid/natural gas dependence by on-site generation
- ▶ Improves base flexibility for growth, new missions
 - More missions in CAA (Clean Air Act) non attainment areas
- ▶ Helps meet conformity requirement in CAA
- ▶ Improves energy security – even if purchased from nearby sellers
- ▶ Plentiful resource, potential to displace all DoD power purchase (not realistic potential, but that is the magnitude we are talking about)
- ▶ Potential to “fix” future power costs at prices at or below current ones
- ▶ On-site energy projects may limit encroachment and deter BRAC listing
- ▶ Good “citizen” – Pro-environment, boosts local economy, environmental stewardship, etc.
- ▶ Links Army/AF tactical use to Installation use (esp. solar)
- ▶ Helps meet either EO 13123 or eventual Renewable Purchase requirements

DoD/Installation Objectives

- ▶ Assessment must “make sense for the military”
 - Must be consistent with installation mission/operations
 - Maintain DoD jurisdiction over installation renewable resources
 - Reduce premiums (and generate ancillary revenue, if possible)
 - Address electric infrastructure security, reliability for growing DoD needs
 - Obtain air credits in non-attainment areas
 - Satisfy growing Congressional requests, and Administration goals
 - Obtain credits toward EO 13123 federal energy goals
 - Do the preliminary “homework” for energy managers (ID tech/resource, reduce premium, help resolve mission conflicts, streamline contracting)
 - Build dedicated expertise (retirement, transfer challenges) in DoD and among DOE lab, other “helpers”

Key Activities

- ▶ PNNL has the lead on program coordination, utility and interconnection market analysis, economic analysis, security analysis, roadmapping, reporting and documentation.
- ▶ Solar – comprehensive study underway matching bases, renewable technologies, resources, and economics (PNNL/Navy lead, Sandia supporting).
- ▶ Geothermal – 34 sites investigated, 14 receiving further study, and 3 to be monitored (Navy geoT Office supporting).
- ▶ Wind – 39 site visits and studies complete, preparing for installation of meteorological towers (GEC leading on NREL subcontract).
- ▶ Green Power procurement – strategic plan/approach to Green Power procurement being developed to reduce premiums (PNNL lead with AF).

Key Products/Outcomes

- ▶ Database of major installations, energy use and cost, renewable potential, energy suppliers and terms, potential mission conflicts.
- ▶ Inventory of possible on-site development opportunities – Roadmap to get these underway.
- ▶ Green Power purchasing strategy that minimizes price premiums.
- ▶ Preliminary analysis of role renewables/Green Power could play in energy security.
- ▶ Recommendations for changes in laws, regulations, and practices to facilitate renewable development and purchasing by DoD.

Summary Findings

- ▶ Out of ~1000 U.S. installations:
 - 36 have commercial geothermal potential
 - Half preliminarily assessed (4 steps)
 - 75 have technical commercial level wind potential
 - Up to 20 will be ready for 12 months of wind measurement
 - Hundreds of small, remote sites, too
 - 100s have “technical” solar potential
- ▶ Question in process: Where is development cost effective and/or have unique military benefits?
- ▶ Question: Where is it cheaper to buy than have developed on site?
- ▶ Question: How organize to make this happen affordably?

Geothermal Assessment Status

- ▶ ~36 sites judged by Navy to have potential
- ▶ ~ Half will be investigated further now, rest later
- ▶ 3 will have more intense exploration
- ▶ 2 expected to be offered for development soon

Service	Sites with Potential
Army	12
Navy/MC	7
AF	17

Wind Assessment Status

- ▶ Screened first with maps
- ▶ Second with “expert” opinion
- ▶ Third with mission exclusions
- ▶ Finally with site visits

Service	1st Screen	2nd Screen	3rd Screen	Met Tower?
Army	34	28	14	13
Navy/MC	23	16	6	3
AF	48	31	16	5
Total	105	75	36	21

Solar Assessment Status

- ▶ ID'd six off-the-shelf technologies
 - PV
 - PV/hybrid
 - Solar hot water
 - Pool heating (indoor & outdoor pools)
 - Solar walls
 - Daylighting
- ▶ Screened ~800 installations for applications
 - Spreadsheet tool for installation/IMA use (one stop shopping, economic evaluations included)
- ▶ Next step is selected BCAs to
- ▶ Goal is “1391-ready” projects

Number of Sites with Solar Potential Applications at X Simple Payback in Years

Service	SDHW E	SDHW G	Indr Pool	Outdr Pool	PV-grid	PV-hybrid D	PV-hybrid P	Solar Wall	Daylight
Army									
0-3 yrs	9	3	5	1	0	0	0	12	5
3-6 yrs	23	6	15	3	6	3	3	32	24
6-9 yrs	36	26	29	3	2	5	7	15	27
Navy/MC									
0-3 yrs	45	4	10	1	1	0	0	19	22
3-6 yrs	84	34	65	28	27	20	21	59	99
6-9 yrs	78	50	47	23	18	9	47	48	74
AF									
0-3 yrs	10	4	5	4	0	0	0	24	3
3-6 yrs	62	6	53	6	4	4	6	72	59
6-9 yrs	60	68	51	10	6	11	16	23	57

Purchasing Strategy

- ▶ Market price for Green Power may be less than on-site
- ▶ On-site may not be feasible (AF esp.)
- ▶ Energy security value similar if “near” base
- ▶ Strategy components
 - Procure regionally
 - Match contract terms to financial needs of industry (long term vs. short term commodity purchases)
 - Working with DESC on model RFPs, contracts, pre-procurement seminars for industry
 - Time purchases to industry expansion and energy price/choice cycles (database)
 - Support transmission additions (reliability)
 - Reduce Ancillary Service costs through regional aggregation/wheeling
- ▶ ST – Timely response to early industry proposals (don’t wait for official report as natural gas prices climb)
- ▶ LT – IMAs central to regional aggregation strategy

Purchasing Strategy Status

- ▶ Pool efforts with DOE/WAPA to “test the waters” and procurement approach
- ▶ Target “hot” areas for regional aggregation and industry collaboration
 - PMAs (WAPA, BPA, and TVA)
 - PJM (DC area)
 - Texas
- ▶ Keep flexible to take advantage of opportunities that arise

Points of Contact

- ▶ Wind Purchases and Solar: Mike Warwick, PNNL, 503-417-7555, mike.warwick@pnl.gov
- ▶ Wind Purchases: Mike Santoro, AFCESA, 850-283-6463, mike.santoro@tyndall.af.mil
- ▶ On base siting for wind: Kevin Smith, Global Energy Concepts, 425-822-9008, ksmith@globalenergyconcepts.com
- ▶ Army operational questions: Hank Gignilliat, ACSIM, or TBD?
- ▶ Geothermal and other questions: Gueta Mezzetti, Program Manager, DoD Renewables Assessment, Counselor on Energy, USAF/ILE, 703-604-4306, gueta.mezzetti@pentagon.af.mil