Additional FEMP Support Due to ARRA: NREL Capabilities

Inter-Agency Energy Managers Task Force Meeting

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Contents

- Facilitation of alternative financing (leverage private sector financing)
- RE project assistance
- Net Zero/sustainability design
- Transportation solutions (agency/site strategic planning assessments, PHEV/EV, alternative fuel vehicles/fuels, fuel efficiency strategies)

ESPC

- Leveraging opportunity (new IDIQ, EE, RE construction/major renovation projects)
- Capabilities,
  - Long history of FEMP ESPC support
  - FEMP Core Team Support (support agency ESCO selection; RE Screening for new ESPC/other alternative financed projects; demonstrate non-ESPC implementation vehicles)
  - Agency ESPC training (new IDIQ and EISA 517 training program)
  - Co-Author of Draft EISA 518 Non-Building ESPC Study

ESPC TEAM Franchising
(DOE-DOS MOU)

- FEMP TEAM Model
- Objective: assist DOS with systematic, large scale “Post” ESPC implementation of PV and energy retrofits
  - FY09: 3-5 most cost effective PV projects
    - Technology Specific PV IDIQ)
    - Diesel-generator-PV hybrids
  - FY09 – FY12+: annual implementation of 10-20 projects

Utility Partnerships: Utility Energy Service Contracts (UESC)

- Emerging opportunity (energy security, utility privatization, RPS, Smart Grid, EEI/IOU engagement)
- Capabilities
  - Partnership Building (develop utility partnerships, enabling documents)
  - Training (UESC training activities/project financing workshops/ utility industry partners)
  - Direct Project Assistance (IRS/Washington Gas UESC, Lakehurst NAS PV/NJ Natural gas, GSA St. Elizabeth Cogen WDC $80M)

RE Power Purchase Agreements (PPA)

- Primary onsite RE project implementation mechanism .
- Capabilities
  - PPA project implementation assistance (project identification/development, economic assessments (proformas), agreement structure/model contracts, etc.)
    - NREL (first DOE PV PPA 2007, 4 PPAs totaling 2.6MW)
    - Current agency projects (Princeton, WIPP, Brookhaven, EPA NJ, McGuire AFB, Picatinny, Lakehurst, NASA Ames, USFS in California, NASA Ames Research Center, DOD San Pedro, Pantex)
- Utility scale project assistance

RE Project Assistance
(Onsite/utility scale)

- Project identification/prioritization
  - Pre-screening analysis/ongoing project viability assessment tool (agency/site wide/cross technology)
  - Renewable Energy Optimization (REO) tool
- Project assessment (detailed site reports, DOE TEAM, wind met towers, HOMER (Micropower Optimization Model))
- Project implementation (PPA, ESPC,ESPC (ESA))

RE Prescreening Analysis Tool

(Navy WFO: Navy-wide,cross technologies)

- **Prescreen sites for RE economic feasibility (solar and wind)**
  - Initial prioritization of RE project opportunities (“rack and stack”)
  - Site-specific factors considered (energy rate & use, solar and wind resource, technology capital & O&M cost, applicable incentives)
- **Ongoing project viability assessment tool**
  - Interactive, user sensitivity analysis tool-facilitates ongoing assessment of RE project economics (future RE project economic viability?)
  - Sensitivity factors include (system cost and size, utility rates, utility escalation rates, discount rates, O&M Costs)

NAVFAC
Naval Facilities Engineering Command
Engineering Service Center

Navy RE Sensitivity Analysis Tool

Mid Value of PV Results

PV System Cost Scenario: Default

Filtered Site Number: 53

PV Output Element | Totals

Electricity Price Scenario | Totals

	Default	Low	Current	High
DUERS UIC	M62974	M62974	M62974	M62974
SITE NAME	MCAS YUMA AZ	MCAS YUMA AZ	MCAS YUMA AZ	MCAS YUMA AZ
STATE	AZ	AZ	AZ	AZ
Utility	Imperial Irrigation District	Imperial Irrigation District	Imperial Irrigation District	Imperial Irrigation District
Electric Rate ($/kWh)	0.08	0.07	0.08	0.10
System Size (kW-DC)	100.00	100.00	100.00	100.00
Annual Energy Savings (kWh/yr)	184,930.90	184,930.90	184,930.90	184,930.90
System Cost w/o Incentives ($)	803,000.00	803,000.00	803,000.00	803,000.00
Annual O&M Cost ($/yr)	1,365.10	1,365.10	1,365.10	1,365.10
Annual Cost Savings ($/yr)			12,945.16	14,794.47	18,493.09
PB w/o Incentives (yrs)			69.34	59.79	46.88
Capital Cost after state and local incentives ($)			778,000.00	778,000.00	778,000.00
Payback state and local incentives (yr)			67.18	57.93	45.42
Capital Cost with utility/local, state, and federal incen			466,800.00	466,800.00	466,800.00
Payback Period with incentives (yr)			40.31	34.76	27.25
State Incentive Notes			operty Tax exemption for a...	100% Property Tax exemption for a...	100% Property Tax exemption for a...
Local & Utility Incentive Notes	-	-	-	-
State Incentive End Date	12/31/2012	12/31/2012	12/31/2012	12/31/2012
Local & Utility Incentive End Date	-	-	-	-
Federal Incentive End Date	Subject to change after 12/31/2008...	Subject to change after 12/31/2008...	Subject to change after 12/31/2008...	Subject to change after 12/31/2008...

Payback Periods with and without Incentives

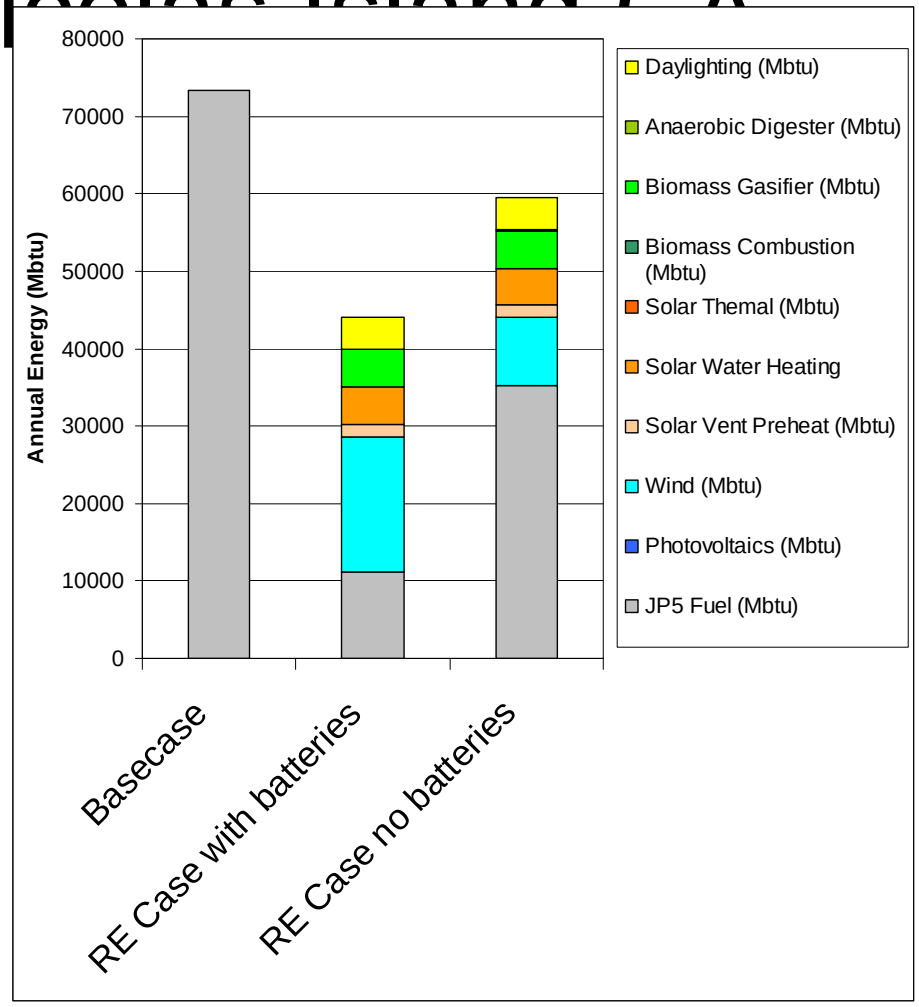
Results from a PV Analysis at a Yuma AZ Site

Renewable Energy Optimization Tool

- Identifies the cost combination of renewable energy technologies that:
  - Minimizes Life Cycle Cost
  - Achieves net zero energy use
- RE technologies considered (PV, wind solar ventilation air preheating, solar water heating, solar thermal/solar thermal electric, biomass heat/power, daylighting)
- Best mix of renewable energy technologies depends on (renewable energy resources; technology characterization; cost ($/kW installed, O&M Cost); performance (efficiency); state, utility and federal incentives; economic parameters)

REO Example: Minimize Life Cycle Cost

US Navy San Nicolas Island CA



Sustainable Design/Net Zero Activities

- Systems approach
- Capabilities
  - Whole building design (S&TF LEEDs Platinum laboratory building)
  - LEEDs Existing Buildings (pilot-Thermal Test Facility laboratory building)
  - Net Zero building design (Research Support Facility office building)
  - Campus/communities/DoD Net Zero Energy Installations

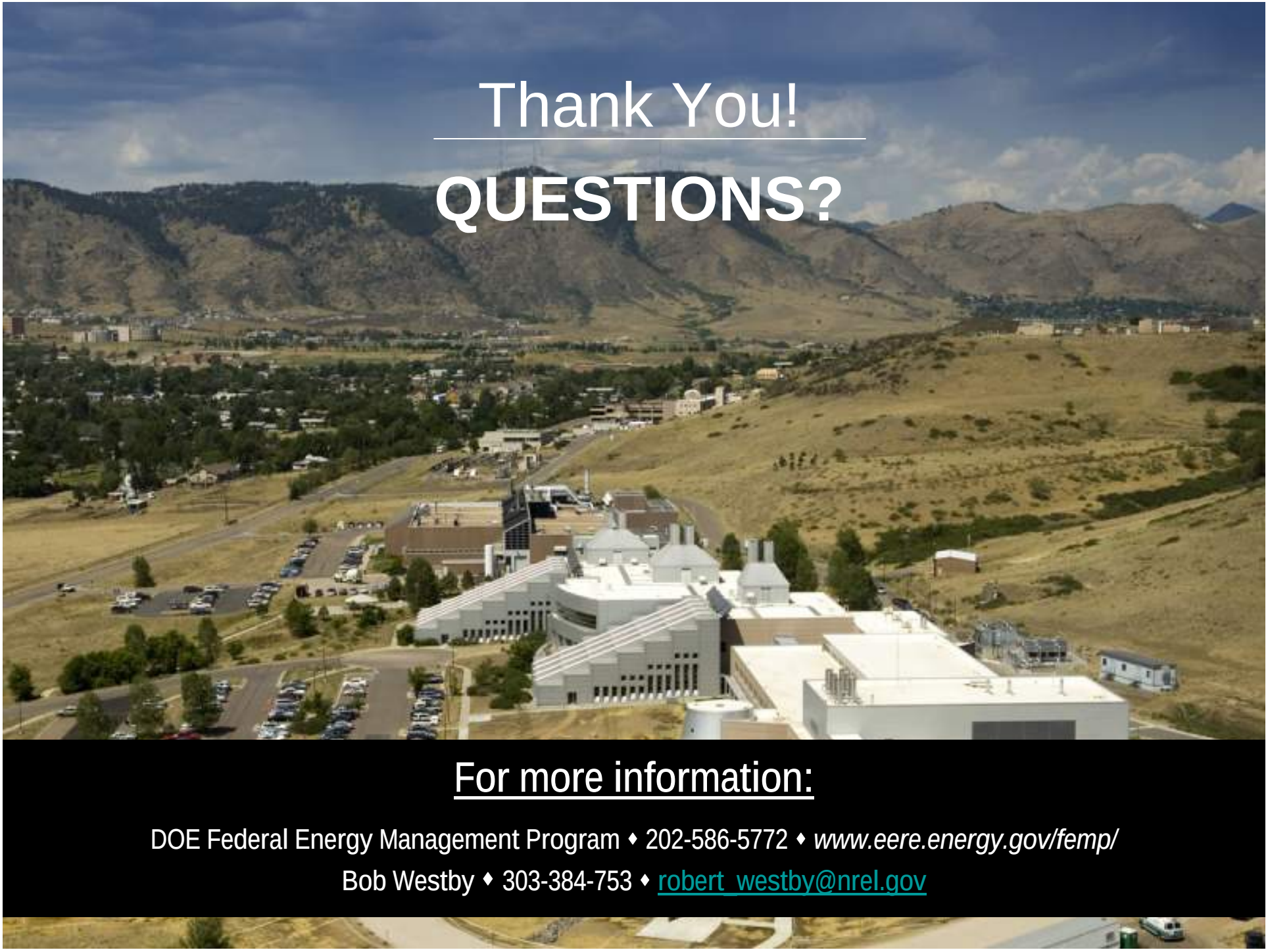
DoD-DOE Initiative:
Net Zero Energy Installations (NZEI) Task

- Definition: Military installation that produces as much energy on or near the installation, as it consumes in its buildings and facilities.

- Objective: Create a repeatable template for planning and developing net zero energy installations

Net Zero Energy Installations (NZEI) Task (cont.)

- Approach: Select pilot installations to demonstrate integrated use of:
  - Energy efficient retrofit technologies
  - Energy efficient new construction
  - On or near base renewable energy generation,
  - Electricity system interconnection and control
  - More efficient vehicles and renewable fuels for non-tactical fleet



Thank You!

QUESTIONS?

For more information:

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