Army
Approach to Deep Energy Retrofits in Energy Performance Contracting

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The World of the Army

- Army Real Property Portfolio ~ 1 Billion Square Feet
  (approximately 30% of all Federal SF)

- Campus Approach – Our “Facilities” are small cities, not just individual buildings

- Largest Single Facility Energy User in USA

- Energy Security & Sustainability (ES^2) Strategy

- Net-Zero Philosophy
  - Energy
  - Water
  - Waste

Types of Funding

- Military Construction (MILCON) – No! Only for new construction.

- Sustainment, Restoration, and Modernization (SRM)
  - Limited
  - One Year Funds
  - Prioritized at local base for submission up the chain for funding approval
  - Based on urgent needs, not overall strategy to recapitalize

- Alternative Financing – ESPC & UESC
  - Half of energy projects (by investment value) in FY14 & 15 executed through ESPC & UESC

- Mixed or “Combined Funding”
  - SRM Funded Renovation in conjunction with ESPC
  - One Time Cost Avoidance within ESPC

Lessons Learned

- Created Guidance in 2008 on how to execute projects
- Updated Guidance in 2015 to provide clarification on frequently asked questions, update procedures, and address recommendations from audits on program and individual projects
- Champion for project – need local ownership of project and leadership support. Energy Manager and other stakeholders involved in project development and execution. Support from local Commander/leadership. We don't originate projects from the top down, but rather provide support framework to make it easier for installations to originate their own projects
- Provide support for quasi-centralized contracting & project management centers with expertise in this unique type of contracting. Support partially funded centrally from HQ to retain qualified staff, and partially funded by fees from installation for contracting, project management, legal, and technical support.
- Truly partner with ESCO or Utility – early, open & honest communication prevents problems from getting worse and builds relationship for follow-on work

DER Best Practices

- Rocky Mountain Institute identified many Best Management Practices for Deep Energy Retrofits while analyzing the General Services Administration's National Deep Energy Retrofit Pilot:
  - Setting aggressive goals early
  - Removing artificial project limits such as term length and payback thresholds on ECMs
  - Developing strong communications plan early that engages all stakeholders
  - Engaging building occupants, IT & security personnel, and O&M staff as well as financial managers and leadership
  - Establish a support system
  - Centralizing resources and streamlining the ESPC process
  - Developing consistent practices between national & regional offices
  - Including appropriated funds where available to increase scope and potential savings

DER Best Practices (cont)

- Bundling energy and water conservation measures into comprehensive package
- Utilize a holistic and iterative design process
- Measuring and verifying success
- Recognizing additional benefits that ESPCs provide
- Achieving net-zero where possible

US Army already utilized all but one of these as far back as 8 years ago (and included in guidance), but have not utilized consistently on all projects. Need to include as standard operating procedure. We have also found additional Best Management Practices:

- Promote installation-wide “fence-to-fence” projects rather than smaller targeted projects
- Used a phased approach so personnel are not overwhelmed by projects that are so large that staff resources cannot support

Recent Project Highlights

- 6 projects in Deep Energy Retrofit range of 30%-72% savings (measured for entire installation not just individual building)
- 7 more projects will enter this range after additional phase
- Addressing industrial base energy use with projects at Rock Island Arsenal and Corpus Christi, Letterkenny, and Tobyhanna Army Depots. Some projects saving up to 40% of energy while recapitalizing 1940's era process equipment.

Air Exchange System as part of ESPC at Rock Island Arsenal, IL

Old Industrial Process Tanks to be upgraded -Rock Island Arsenal, Il

Recent Project Highlights

- Fort Buchanan achieved 54% energy and 70% water savings. Includes PV and wind turbines.

Rain Water Capture System,
Fort Buchanan, PR ESPC

PV Array and Wind Turbine,
Fort Buchanan, PR ESPC

Golf Course Irrigation System,
Fort Buchanan, PR ESPC

Recent Project Highlights

- Puerto Rico Army National Guard project saved 72% on energy and included 0.5 MWh battery storage for the first time in an Army ESPC. Provides grid stabilization for 6 MW PV array.
- Fort Knox UESC achieved 57% energy savings utilizing district ground source heat pump system. Also, extracts shale gas from site and uses in distributed cogeneration for 100% islanding capability.

CHP Plant,
Ft Knox

Battery Storage,
PR ARNG ESPC

- Projects are increasingly holistic – including Water, RE, CHP, and building envelope to recapitalize facilities and increase readiness.

Changes & What is Missing

Changes

- Leadership Support has enabled expansion - $2.5B total investment since inception (ramped up $1B investment just under PPCC – Dec 2011 to present)
- 25 Year UESC Task Order Term Rule Change
- Combined Heat & Power Initiative
- Plug Loads/Process

What is Missing

- DER Best Practices Guide
- Benchmarking and Trigger Criteria Data
- Accounting for non-Energy/Water Benefits
  - General Performance Contracting?

Questions?

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