

Energy Engineering Analysis Program



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Energy Assessments at Army Installations

Program Overview

January 2008



**U S Army Corps
of Engineers**

Engineering and Support
Center, Huntsville



**U S Army Corps
of Engineers**

Engineer Research and
Development Center



**U S Army
Installation
Management
Command**





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EEAP OBJECTIVES

- Achieve army energy goals by identifying and eliminating energy waste at army installations
- Stream-line use of energy efficient technologies by developing and implementing energy projects
- Develop Army wide network to share good ideas and lessons learned



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EEAP TEAM

- **IMCOM HQ – Program Sponsor**
- **USACE HNC – Program Manager**
- **USACE ERDC – CERL – Assess Team**
- **PNNL – Assess Team**
- **ENERGY CONSULTANTS**



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Assessment Process

- **Installations are identified**
- **Initial Visit – Team identifies energy issues, gathers information and coordinates survey effort**
- **Survey – Site survey to gather information and identify energy conservation projects**
- **Team develops cost and feasibility analyses of individual energy conservation projects**
- **Team integrates data and develops reports**



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FY06 SURVEY RESULTS

Installation	Number of ECMs	Annual Energy Savings MMBTU	Annual Savings (\$M)	Capital Investment (\$M)	Simple Payback (years)
Rock Island Arsenal (RIA)	259	207,019	\$2.6	\$26.5	10.2
Fort Polk	247	207,324	\$4.1	\$13.6	11.8



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FY07 SURVEY RESULTS

Installation	Number of ECMs	Annual Energy Savings MMBTU	Annual Savings (\$M)	Capital Investment (\$M)	Simple Payback (years)
Fort Belvoir	259	207,019	\$2.6	\$26.5	10.2
Aberdeen Proving Ground	70	720,279	\$13.9	\$49	3.5
Fort Drum	8	42,738	\$1.3	\$8.8	6.9
Fort Bliss	44	345,543	\$9.2	\$30.5	3.3
Fort Rucker	62	164,972	\$2.4	\$10.9	4.5
Fort Lewis/Yakima/ McChord AFB	75	497,226	\$11.2	\$35.4	3.2
USMA*	*TBD	*TBD	*TBD	*TBD	*TBD

*Report due January 2008



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FY08 Survey Sites

- **Fort Bragg**
- **Fort Benning**
- **Fort Carson**
- **Fort Shafter**
- **Fort Hood**
- **Fort Huachuca**
- **Natick Army Soldier Center**



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SIGNIFICANT ENERGY CONSERVATION FINDINGS



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Mold Prevention – Barracks (Quality of Life/Health)

- **Engineer HVAC to control moisture. Provide ability to pre-chill room supply air to reduce moisture content**
- **Increase amount of room supply**
- **Replace windows to reduce air infiltration**
- **Increase bathroom exhaust to remove excess moisture.**
- **Eliminate sources for condensation**
 - **Chilled water pipes – proper insulation**
 - **Eliminate Cold surfaces**
- **Install dedicated outdoor air supply unit delivering very dry air**



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Heating, Ventilating, Air Conditioning

- Stop simultaneous heating and cooling
- Install door based sensor to turn off heating
- Replace forced air heating with radiant heating
- Retrofit Air Handling Units (AHUs)/building envelope for economizer
- Schedule AHUs
- Optimize AHU supply flow rate in buildings that have changed use
- Turn off makeup air
- Replace steam with hot water boiler
- Install moisture control in barracks
- Install moisture control in lodging



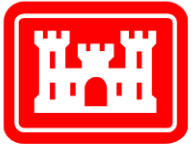
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Controls

- Schedule AHUs to match building occupancy
- Install Direct Digital Controls (DDC)
- UMCS upgrade / modernization highly necessary for energy savings / comfort / maintenance awareness....
- Upgrade controls to DDC at most buildings, connect to Utility Monitoring & Controls System/Base wide Control System
- Implement night and weekend temperature setback



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Central Energy Plants

- Update and fix controls
- Interconnect District Heating Systems and convert from steam to hot water
- Install central cooling systems
- Shutdown boilers in summer
- Convert the waste incineration plant into the biomass heat and power plant connected to the low temperature hot water system



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Building Retro-Commissioning

- Retro-commissioning (a type of existing Building Commissioning) is a systematic process for investigating, analyzing, and optimizing the performance of building systems through operational and maintenance improvement measures and ensuring their continued performance over time. The retro-commissioning process assists in making the building systems perform interactively to meet the Owner's current facility requirements.
- HVAC – Improve indoor air quality, flow balancing, AHU replacement/repair, filters, controls, tune up boilers, add heat/cooling recovery, etc.
- Building Envelope – Add insulation, replace windows, replace door seals, add window shades/film
- Water – Install water conservation equipment
- Lighting – Add day lighting, add occupancy sensors, relamp with energy efficient lamps, etc.



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Questions or Comments ? **Contact Information**

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