



FORT A. P. HILL

Caroline County, VA





Fort A. P. Hill – Energy Assessments & Audits



Fort A. P. Hill

- Approx. 76,000 Acres
- Spent almost 2.5 million dollars on utilities in FY09
- Large transient population

- 380 Bldg.'s totaling 1,187,000sf
- Only 14 buildings over 10,000sf
- Bldg.'s date from 1940's to present





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Guiding Regulatory Documents and Goals

Energy Policy Act of 2005 (EPAAct 2005)

Reduce total energy consumption by 2% per year for 10 years.

Executive Order 13423

Reduce total energy consumption by 3% per year for 10 years.

Reduce water consumption by 2% per year for 10 years.

All procured energy consuming products must be Energy Star or meet FEMP criteria (unless shown not cost effective).

Energy Independence and Security Act of 2007 (EISA 07)

Focuses on efficiency and renewable energy.



Army Energy Strategy

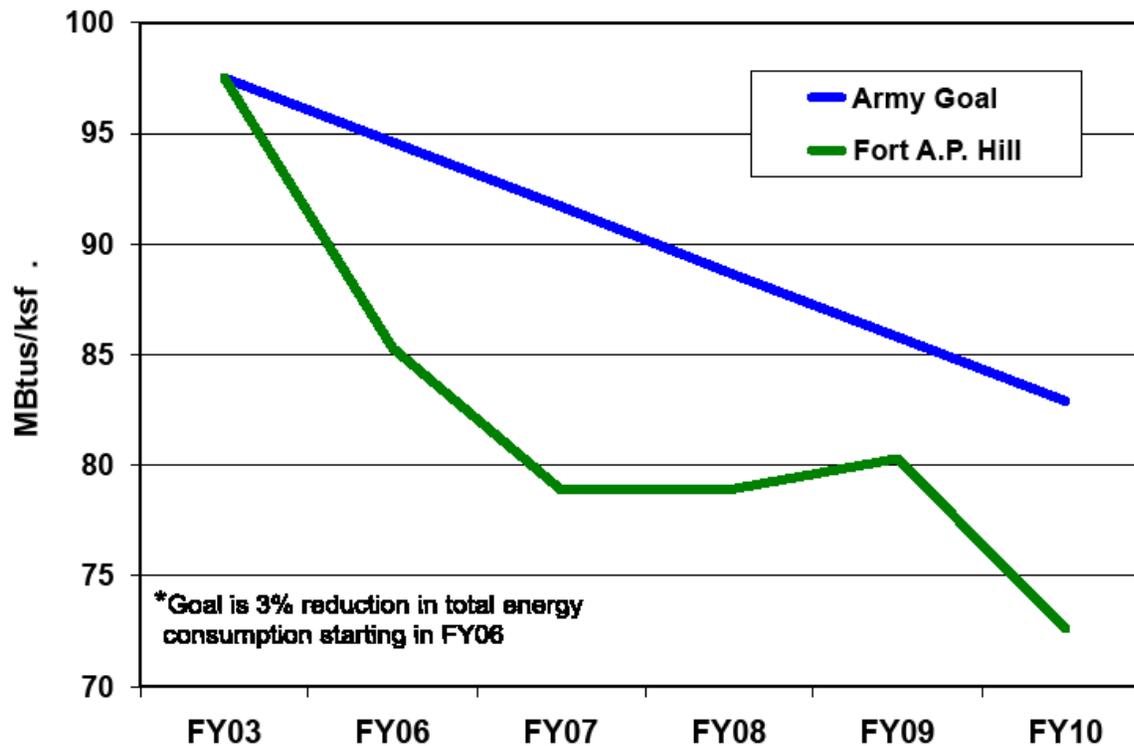
- 1. Eliminate Energy Waste in Existing Facilities**
- 2. Increase Energy Efficiency in New Construction and Renovation**
- 3. Reduce Dependence on Fossil Fuels**
- 4. Conserve Water Resources**
- 5. Improve Energy Security**



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Energy Reduction vs Army Goal



As of the end of April
FY10 Fort A. P. Hill has:

- Saved over **\$330,000** as compared to this time period in FY09
- Reduced energy usage by over 9,000 Mbtus as compared to this time period in FY09
- Reduced energy usage by 27% as compared to 2003 baseline



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Army Audits – Types and Frequency

- Army requires an energy audit on 20% of total building square footage per year.
 - Performed by member(s) of installation energy team.
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- Army performs an Energy Awareness and Conservation Assessment (EACA) on every installation once every 5 years.
 - EACA performed as per American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) Level I energy audit
 - Performed by third party

Level 1 Audit is a low level walk-through assessment. Identifies low-cost/no-cost measures. Also identifies potential capital improvements that merit further analysis



Preparing For An Audit / Assessment

Information

- Floor plans
- HVAC equipment
- Building use
- Occupancy
- Fuels
- Utility bills
- Other notable energy consuming equipment
- Coordinate access and meetings with people you want to talk to
- Know the electric rate schedule (ex: are there peak demand costs)

Equipment

- Light meter (<\$150)
- Camera
- IR Thermometer (<\$100)





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Building Energy Monitor (BEM) Program

- A BEM is an individual who is responsible for achieving the goals of the Energy Program within their designated building. The goal of the program is to communicate with the occupants on what they can do to increase energy conservation and to report any problems that need to be fixed.
- Person familiar with their building and day-to-day operations that can easily communicate with fellow building occupants.
- Initial training to familiarize with goals, policies, and initiatives with quarterly meetings thereafter.



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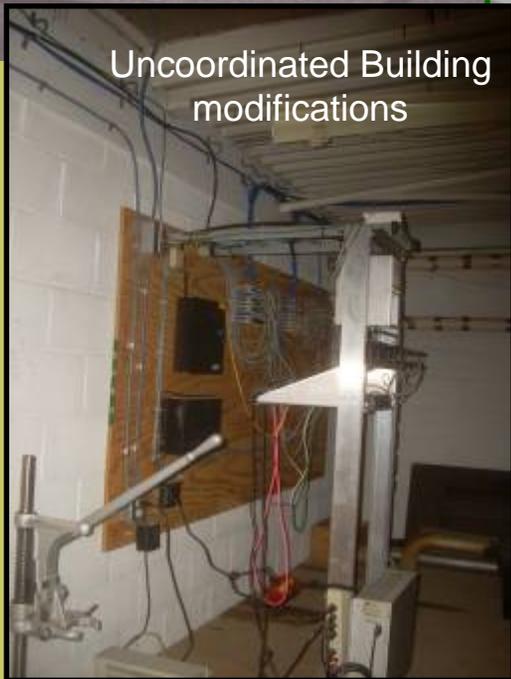
Building Occupant Awareness



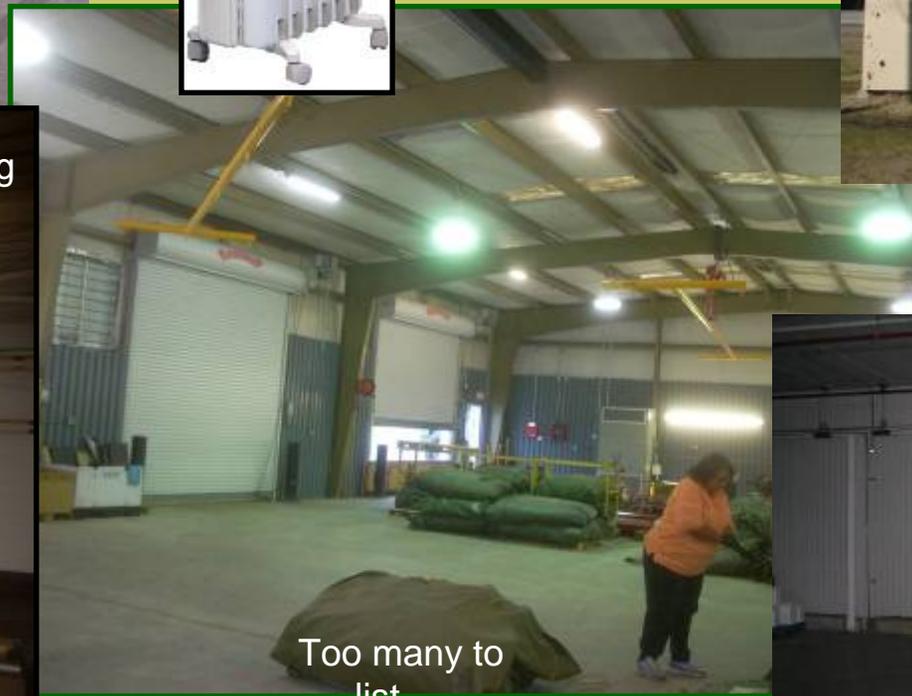
Closed or blocked registers



Open doors w/ heat running



Uncoordinated Building modifications



Too many to list....

A BEM will help!



Multiple large empty freezers



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Exterior Lighting

Most Common Issues

- Awareness / behavior
- Bad photocells



It helps to identify the exterior light switch



Solutions

- BEM / awareness
- Photocell/fixture replacement



Unnecessary Lights

Most Common Issues

- Awareness / behavior
- Technology (HID slow re-light)



Solutions

- BEM / awareness
- Occupancy Sensors
- Fixture upgrade



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Light Fixtures

Most Common Issues

- Inefficient fixtures (T-12, incandescent bulbs)
- Excessive light levels (>50fc workspace, >30fc common)



Solutions

- Bulb replacement (CFL's)
- Delamping
- Fixture replacement (T-8, T-5, 25w T-8)
- LED (exit lights, walk-in freezers)



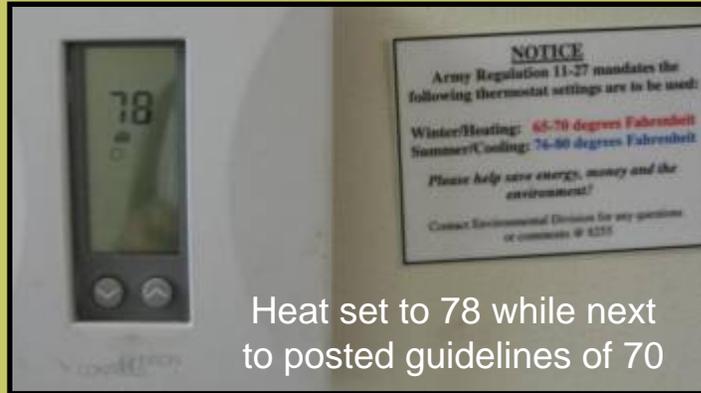


Infiltration: Weather Stripping & Fan Dampers





Climate Control



Heat set to 78 while next to posted guidelines of 70

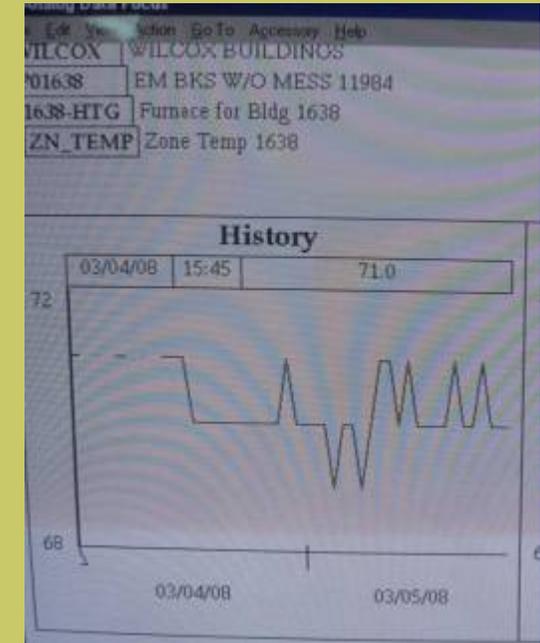
Most Common Issues

- No control over thermostats
- Awareness



Solutions

- BEM
- Thermostats with hidden or lockable temperature range limits
- Energy Management Control System



Manually switched to auxiliary heat



Equipment Maintenance & Age

Most Common Issues

- Preventive maintenance (filters, cleaning..)
- Equipment settings are incorrect



Propane fired 98% efficient condensing tankless HW heaters



20 yr old water boiler



Dirty filters



Hot water temperature reading 159

Solutions

- Maintenance staff to maintain PM / service logs
- Familiarize maintenance staff on setting's policies
- Inventory equipment





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Night Tour: Lights, Set-backs, Equipment



Solutions

- BEM / Awareness
- Occupancy Sensors



Excessive light levels and ON after hours





Electricity Demand Cost Reductions

Most Common Issues

- High electrical rates for monthly peak usage
- Winter morning building warm-ups with heat pumps w/ resistant heating
- Space heaters

Solutions (evaluated against demand cost)

- Stagger building warm-up schedules
- Eliminate night time temperature set-backs on buildings with heat pumps only
- Reduce the amount of resistant heating (extends the warm-up time)



- One normal rated space heater can cost Fort A. P. Hill \$14.63 a month just in electric demand cost, and up to \$36 a month total for operating only 9 hours daily.





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