

Water Savings Opportunities at Federal Facilities

GovEnergy 2007

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August 7, 2007



**ALLIANCE TO
SAVE ENERGY**
Creating an Energy-Efficient World



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What is the Alliance?

- NGO coalition of prominent business, government, environmental and consumer leaders who promote the efficient and clean use of energy worldwide to benefit the environment, economy, and national security.
- Mission: To advance energy efficiency world-wide through policy, education, research, technology deployment, market transformation and communication initiatives.
- Chaired by Senator Mark Pryor (D-AR) and James Rogers (CEO, Duke Energy) with strong bi-partisan congressional, corporate & public interest leadership



- **What:** **The Alliance to Save Energy’s inaugural Energy Efficiency Global Forum & Exposition, better known as “EE Global”**
- **When:** **November 11-14, 2007**
- **Where:** **The Washington D.C. Convention Center**
- **About:** EE Global will serve as *the premier gathering and showcase for the energy-efficiency industry*, attracting industry professionals, academics and policy makers from around the world, not only to exchange the latest technical, commercial and policy information, but to forge partnerships and develop “best practices” and strategies for global implementation.
- **Highlights:**
 - Exposition Hall** featuring business, government & other Exhibits from around the world
 - 4 Plenary Sessions** providing keynote remarks from top business, government and environmental leaders
 - Executive Dialogue Sessions** offering 90-minute discussions with leading global voices in energy efficiency selected by an international panel of experts
 - Media Day** featuring press conferences, product unveilings & participation from international media outlets
 - Public Day** allowing the general public an opportunity to learn about the latest energy-efficient technologies and products and how to achieve a more efficiency future
 - Networking Events** enabling attendees to meet new colleagues and conduct business in a relaxed, informal setting
- **Web:** www.eeglobalforum.com



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Project Overview

- Funded by FEMP
- Review previous analyses by PNNL, NREL, others
- Survey sampling of federal energy & water managers – agency and facility level staff
 - Current practices
 - Issues
 - Ideas
- Report on findings and suggest opportunities



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Directives & Requirements

- EPAAct 1992
- 1994 – **EO 12902** (*Energy Efficiency and Water Conservation at Federal Facilities*)
- 1999 – **EO 13123** (*Greening the Government Through Efficient Energy Management*)
- EPAAct 2005
- 2006 – **MOU** (*Federal Leadership in High Performance and Sustainable Green Buildings*)
- 2007 – **EO 13423** (*Strengthening Federal Environmental, Energy, and Transportation Management*)



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FEMP Resources

- Per EO13123
 - Guidance on setting a baseline
 - Guidance on establishing a water efficiency goal
- Case Studies
- Product specs
- WATERGY tool
- Links to GSA, Air Force, Navy, other guides
- ***Coming Soon: Water Guidance for new EO***

Survey



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- July – September 2006
- Interviewees (telephone)
 - 7 agency-level
 - 9 regional or sub-agency-level
 - 14 facilities-level
- Geographically dispersed



Key Stats

- ~244-256 billion gallons/year used by federal sector
- Current costs of water & sewer
 - \$0.5 to \$1 Billion/year (source: GSA)
- Savings opportunity
 - 35 – 50 billion gallons/year
 - \$152 - \$216 million/year (source: PNNL)
 - Additional \$13 - \$20 million/year in water heating savings



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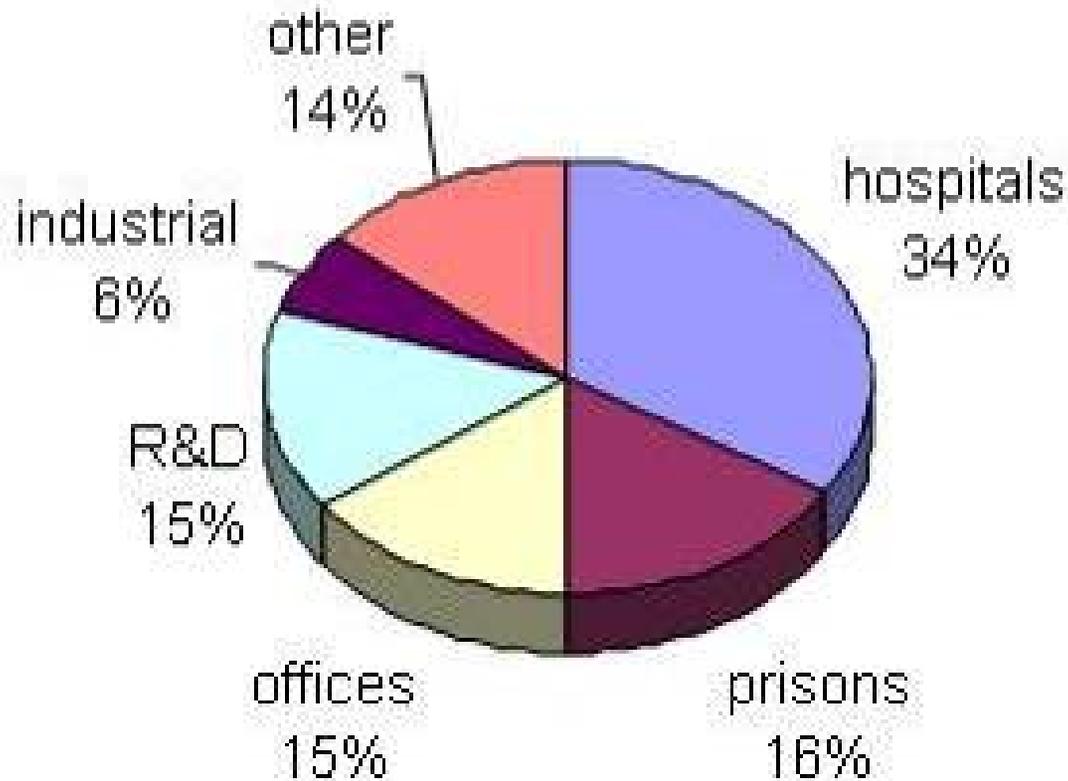
Water Sources

- Municipal water utilities
- Groundwater
- On-site wells
 - More likely at larger sites, such as DoD, DOI, and USDA sites



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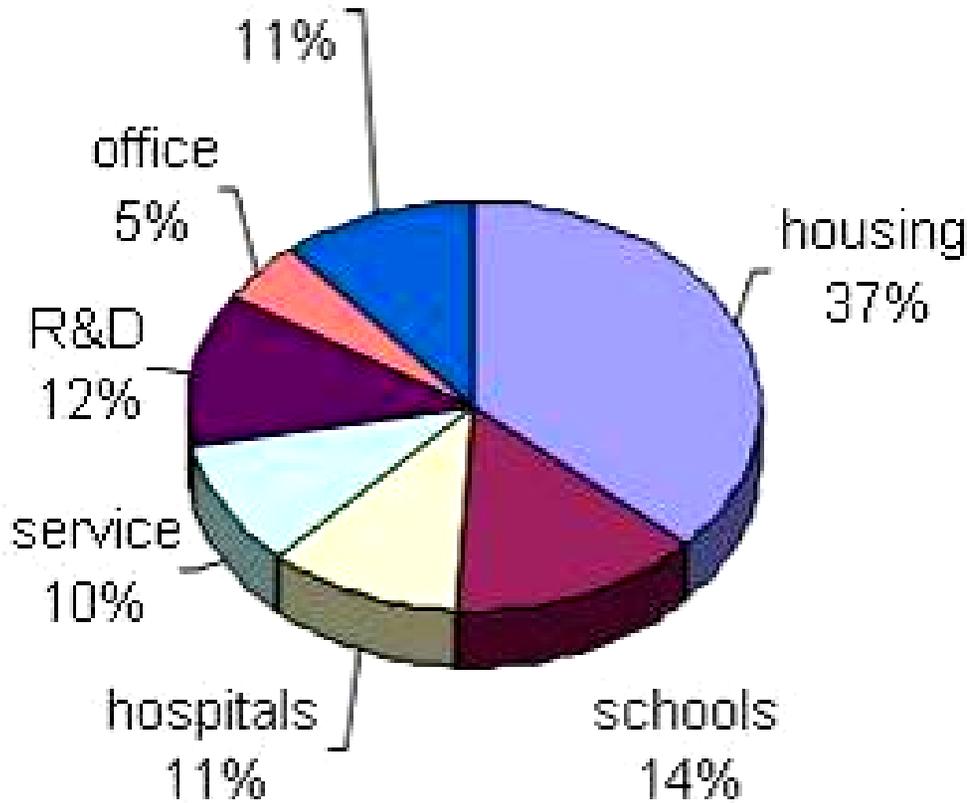
Federal Water Use - Civilian





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Federal Water Use - DoD





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Findings – Water Mgmt Plans

- Required by agencies
- Agencies encouraged to request from facilities
- Many have less formal plans in place
- Larger facilities more likely to have a plan



Findings – BMPs

1. Public Info & Education Programs
 - Common at military bases, esp. for military housing
2. Audits, Leak Detection & Repair
 - Facilities w/ WMPs much more likely to have systematically addressed water loss
 - Routine leak detection not occurring at many facilities
3. (& 10) Irrigation and Water Reuse
 - Practices highly variable, by region
 - Could be 0% to >50% of total consumption
 - Savings opportunities significant



Findings – BMPs

4. (& 5) Water Savings Fixtures

- Low flow fixtures are quite common
- Fed sector is a leader in adopting

6. Boiler/Steam Systems

- Larger facilities w/ central plants have already looked at water efficiency opportunities
- Some have recently removed central plants from service
- Steam & condensate line leak detection is common

7. Single-Pass Cooling Systems

- Many have been upgraded to conventional cooling
- Several facilities still have in place



Findings – BMPs

8. Cooling Tower Systems

- Not used at all facilities
- Many have taken steps, such as chemical treatment
- Some are metering make-up water



Measuring Water Use

- Many have meters on major buildings
- Occasionally on end uses
- Municipality-supplied facilities less likely to have meters
 - Rely on water bills to determine their consumption
- Many recognize need to increase metering
- Hard to justify the cost of the meters



Financing

- Projects usually too small for individual financing
- Lengthy payback periods hurt economic justifications
- Several have had success bundling with energy projects in ESPCs and UESCs
 - ESCOs not interested in smaller sites, though



Training & Resources

- FEMP resources used by many, but several were not aware
- Many also use other non-federal resources, esp. via internet
- Many interested in additional training
 - \$\$ for travel an issue
 - Web casts would be well-received
- Navy Facilities Engineering Service Center has outreach and training



Training & Resources (contd)

- Specific interviewee requests included
 - Directed resources (e.g. for hospitals)
 - Plain-language LCC guidance
 - Data on the expected costs (and savings) of various BMPs
 - Technical guidance on the more complex measures, such as engineered systems (cooling towers, boilers, etc.)
 - Additional case studies, information exchange



Feedback on Savings Goals

- Pro –
 - Should attract management attention
 - Should help get funding approved
- Con –
 - Potential reporting burden
 - Setting a metric difficult –
 - /person – sometimes hard to determine # on base (contractors, tenants);
 - /ft² – could encourage “gaming” the system; could punish facilities removing old, inefficient bldgs from service
 - BRAC



Additional Comments Given

- Management support needed; otherwise just “unfunded mandates”
- Shouldn't forget opp. in leased facilities
- Model specs would be nice
- Should link to sustainability
- Water line flushing – opportunities exist
- Waterless urinals – lots of opinions!
- Expertise of Navy & Air Force engineering centers underutilized



Summary of Key Findings

- Awareness of water opportunities high at the agency level and among facility energy managers
- Top management at facilities not always tuned in
- Fed sector a leader in use of water-saving fixtures
- Many energy managers would like to be doing more, but \$\$\$ is lacking
- Some success tying water into ESPCs
- Those with Water Management Plans in place are more actively pursuing water opportunities
- Large opportunities in irrigation
- Interest in targeted resources



Recommended Actions

For agencies and facilities:

- More metering needed
 - Distribution mains & major end uses
- Many can benefit from leak detection programs
- Water re-use and use of gray water is a significant opportunity for facilities in arid regions with large irrigation uses
- Consider weather- or sensor-based irrigation control technologies



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Recommended Actions

For FEMP:

- Develop targeted resources (e.g. hospitals, data centers, water treatment plants, cooling towers)
- Possible model – Army’s Strategy for the Environment Initiative (sustainability focus)



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Next steps by ASE

- Provide content for FEMP web cast
- Develop case studies
- Highlight best practices



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Recommended Reading

- PNNL's *Update of Market Assessment for Capturing Water Conservation Opportunities in the Federal Sector*, 2005
- *Air Force Water Conservation Guidebook*, 2002
- GSA Water Management Guide
- EPA's Water Efficiency web resources



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For more info

- www.eere.energy.gov/femp/water/
- Help desk: 1-877-337-3463
 - (EERE Information Center)

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