Increasing Federal Office Building Water Efficiency

With less than one percent of Earth's water available for human use, the Federal Government is leading by example with water efficiency and conservation efforts. Federal laws and regulations require agencies to implement water efficiency efforts and reduce water consumption, making water an integral part of every comprehensive resource management program.

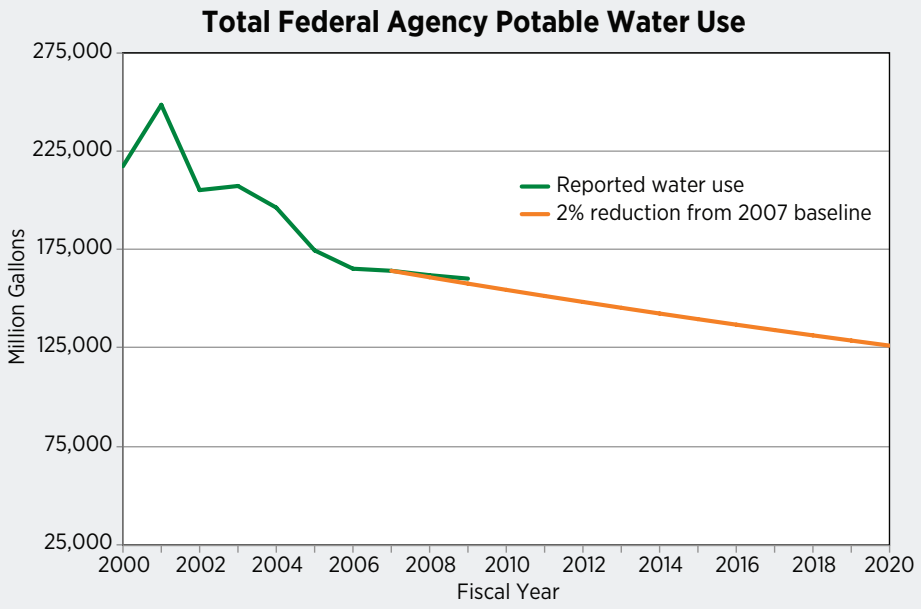
Water Management Planning

A comprehensive water management plan includes clear information on how a Federal facility uses water from the point of access or generation to its ultimate disposal or reuse.

The water cycle for Federal buildings begins at the water utility and continues beyond the building. Water can be reused or recycled, but eventually ends up in a sewage treatment facility and is then discharged back into the environment. Covering the entire water distribution cycle ensures that Federal sites make appropriate water management decisions.

A water management plan should include:

- Water use policy statements and goals.
- Federal regulations and agency water requirements.
- Utility information.
- Water usage data.
- Metering/measurement plans.
- Emergency response information.
- Comprehensive water efficiency improvement plans.

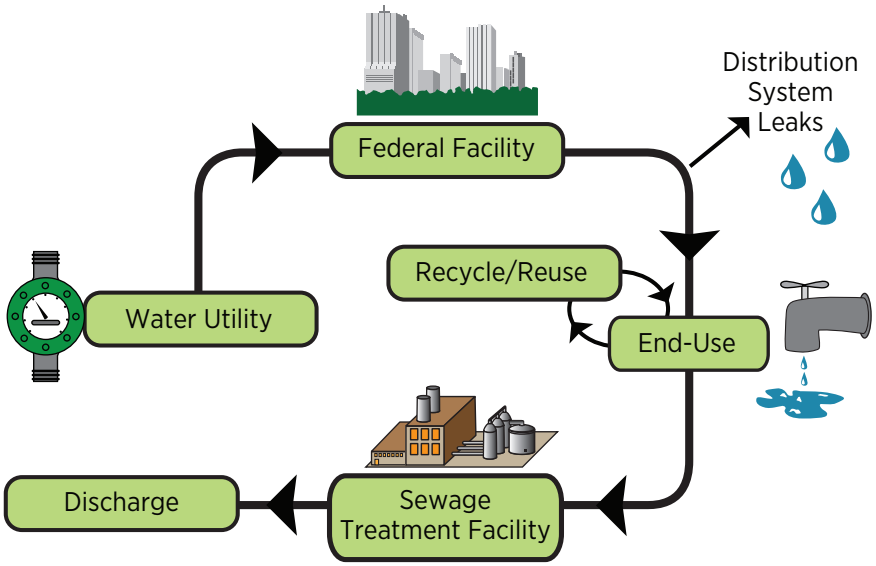


Executive Order 13514 requires a two percent annual reduction in water use (compared to a FY 2007 baseline), significantly reducing total Federal water consumption by FY 2020. View Federal water requirements at *www.femp.energy.gov/program/waterefficiency_requirements.html*.

Water Usage in Office Buildings

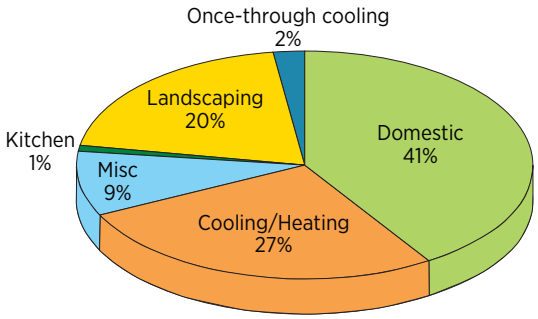
According to the Federal water use indices, a typical employee in a typical facility uses approximately 15 gallons of water per day (gpd). With that in mind, a typical Federal office building of approximately 200 employees uses about 3,000 gpd (see chart on page 2):

- 1,230 gpd for domestic needs.
- 810 gpd for cooling and heating needs.
- 600 gpd for landscape needs.
- 360 gpd for other water needs.



The water distribution cycle for Federal buildings starts at the water utility and ends when water is discharged back into the environment.

Typical Federal Office Building Potable Water Use



A typical Federal office building with 200 employees uses about 3,000 gallons of water in one day. This pie chart breaks down how that water is used.

Getting Started

Take the following steps to improve water efficiency design and operations:

- Benchmark existing facilities.
- Measure and document existing water use.
- Investigate opportunities for water savings.
- Use life-cycle cost methodology in economic analysis.
- Monitor water savings.
- Make leak detection a regular part of maintenance.
- Empower facility staff to work together.
- Educate staff where water is being used and how much water they can save.

Performing a Water Audit

Water audits help Federal facility managers calculate how much water is being used and where. Performing a water audit typically follows four steps:

1. Measure the total water supply, including all on-site and off-site water sources.
2. Measure sub-metered water usage. For efficiency decisions, be sure to identify which buildings and equipment consume water.
3. Estimate unmetered water usage at the equipment and process level, including plumbing fixtures, irrigation, swimming pools, and fountains.
4. Estimate water loss, including accounting errors, meter reading errors, and leaks.

It is important to take the following actions when conducting a water audit:

- Document meter locations and conditions across the site.
- Document how unmetered water usage was estimated.
- Document unmetered water usage locations.
- Identify opportunities for efficiency improvements.

Calculating a Water Balance

A water balance compares total water sources coming into a site with the total amount of water usage at the site. To create a water balance, add water usage outlined in steps two through four of the previously outlined water audit process. Compare this usage to the total water supply developed in step one. The difference between these two numbers shows unknown water usage. A reasonable goal is to have the unknown water usage be no more than 10 percent of the total. Use this data to help identify the facility's biggest water consumer to prioritize efficiency projects.

Best Management Practices

FEMP and the U.S. Environmental Protection Agency (EPA) developed 14 Federal water efficiency best management practices to help Federal agencies increase water efficiency. These best management practices range from water management planning to water-efficient landscaping to cooling tower management to toilets, urinals, faucets, showerheads, and other fixtures.

A full list of best management practices is available at: *www.femp.energy.gov/program/waterefficiency_bmp.html*.

Resources

The U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP) facilitates the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship.

DOE FEMP Water Efficiency:
www.femp.energy.gov/program/waterefficiency.html

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