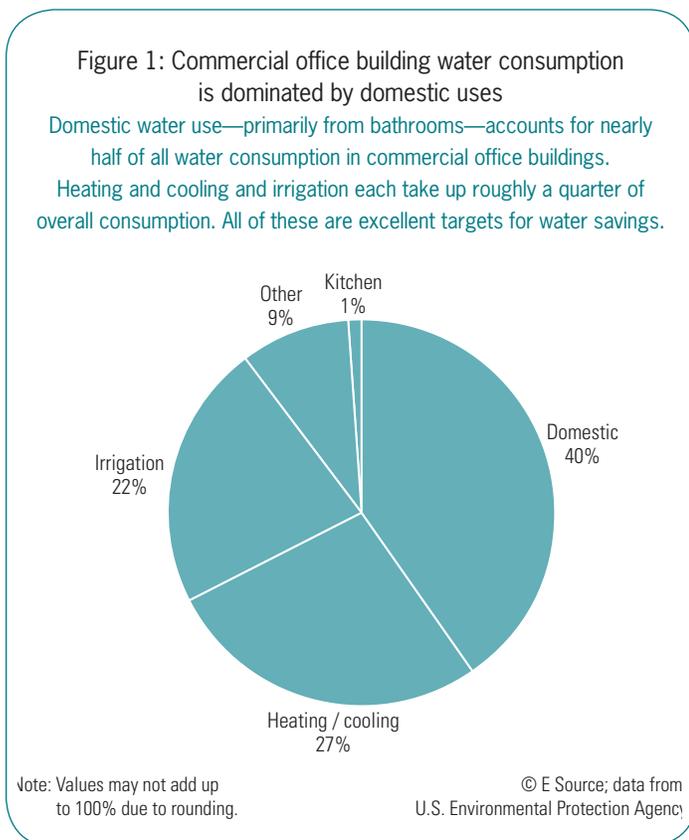


Water-Saving Tips for Business Customers

Commercial buildings in the U.S. use large amounts of water each year—roughly 15 percent of the nation’s overall water consumption. The majority of that water typically goes into domestic fixtures like toilets, faucets and, to a lesser extent, showers. Heating and cooling are the next largest consumers of water, followed by irrigation. Although specialized buildings involving such activities as food service or laundering may exhibit significant differences from these averages, all of these areas can be good targets for water savings. Many of the water-saving measures described in this pamphlet may qualify for rebates—contact your local water utility for more information.

Saving Water Indoors

Because indoor water use represents roughly three-quarters of overall consumption for commercial buildings (**Figure 1**), this is an area with many opportunities for savings. And



because water heaters require electricity or natural gas to operate, many of the following measures also offer energy savings by reducing hot water use, which can make them even more attractive from an economic standpoint.

Faucets. A typical faucet delivers around 2.2 gallons per minute (gpm) of water. By reducing the flow rate to around 0.5 gpm, businesses can significantly reduce their water consumption. This reduction can be achieved by buying a low-flow faucet or by installing an aerator or laminar flow attachment. Aerators work by incorporating air into the water stream to make it feel more voluminous; laminar flow attachments produce many small parallel streams of water to maximize the wetting potential and apparent force of the water coming out of the faucet. In general, laminar flow attachments seem to be preferred over aerators because the stream of water they provide feels more substantial, better disguising the low flow rate.

Converting one faucet rated at 2.2 gpm to one rated at 0.5 gpm can save over 10,000 gallons of water each year, assuming an average use of 30 minutes each business day. This results in an annual reduction of around \$50 in water costs. However, if the energy required to heat the water is also taken into account, the total annual savings increase to over \$100. Because aerators and laminar flow fixtures range in price from around \$0.50 to \$10.00, simple payback periods as short as several weeks are easily attainable.

Toilets. Although the 1992 Environmental Policy Act mandated that all toilets sold in the U.S. be rated at 1.6 gallons per flush (gpf) or lower, there are still a large number of currently installed toilets that use up to 5.0 gpf. By verifying that toilets in business restrooms meet this rating standard and replacing obsolete models with new high-efficiency toilets (for example, those that carry the WaterSense label, part of a partnership program sponsored by the U.S. Environmental Protection Agency [EPA], that use 1.28 gpf or less), businesses can save

large amounts of water—up to \$100 or more each year per toilet, which typically yields simple payback periods of several years.

Another option is to install a dual-flush toilet or tank retrofit. These systems allow users to choose between using the full tank capacity of the toilet or a smaller amount of water when flushing, and can yield an average gpf rating similar to that of a high-efficiency toilet. Though a dual-flush toilet tends to be comparable in cost to a normal toilet, a dual-flush tank retrofit typically costs less than \$100, making it a cost-effective option for businesses.

Low-water or no-water urinals also offer savings potential. In comparison to typical urinals that use 1 gpf, these high-performance urinals offer water savings of 50 to 100 percent (for WaterSense-labeled or waterless urinals), resulting in potential savings of up to \$100 per year per urinal.

Showerheads. Many businesses have bathroom showers that produce a flow rate of approximately 2.5 gpm. However, there are now a number of showerheads available that restrict flow rates to 1.5 gpm without compromising shower quality. By switching showerheads, and thereby reducing flow rates from 2.5 to 1.5 gpm, businesses can save around 5,000 gallons of water per showerhead each year, according to the U.S. Department of Energy—roughly \$100 when energy costs are also considered. At a cost of \$20 to \$30 per showerhead, simple payback periods resulting from replacing showerheads can be as short as a few months.

Energy Star appliances. Although the Energy Star label is a known standard for energy efficiency, some of the rated appliances also offer significant water savings as well, including dishwashers and commercial clothes washers:

- **Dishwashers.** Dishwashers are commonly included in business kitchenettes. By using technology like soil sensors, improved water filtration, efficient water jets, and better rack designs, Energy Star-rated dishwashers use 31 percent less energy and 33 percent less water than conventional machines and can save nearly 500 gallons of water each year. Although these savings probably don't justify replacing a

dishwasher that currently works, it's something to keep in mind when installing a new unit.

- **Commercial clothes washers.** These appliances have energy savings potential in businesses, particularly in laundry facilities and hotels. Energy Star-rated washers save water by implementing a front-loading design that lacks features like the agitators that are standard in most conventional models. In a typical commercial setting, each of these washers can save over 16,000 gallons of water per year, with resultant annual savings of \$70 for water alone and \$125 when energy costs are considered. With an incremental cost of around \$250 over a standard commercial washer, these units can yield a simple payback period of two to three years.

When considering a new commercial clothes washer, it's helpful to understand the Energy Star criteria for assessing water efficiency. All clothes washers are considered on the basis of water factor (WF)—this is the ratio of the volume of water required for a cycle in gallons (gal) to the capacity of the washer in cubic feet (ft³). A low WF means that the washer uses less water to wash a load. Although many conventional washing machines have WFs of around 10 gal/ft³, Energy Star washers are tested to have a WF rating of 7.5 gal/ft³ or lower, and a number of Energy Star washers have WFs as low as 3 gal/ft³.

- **Pre-rinse sprayers.** In food service facilities, pre-rinse sprayers are used to remove food from dishes before they are placed in a dishwasher. Although a national standard mandates that all pre-rinse sprayers manufactured after 2006 be limited to a flow rate of 1.6 gpm, many currently installed sprayers use up to 5 gpm, according to the U.S. Department of Energy. Part of the problem is that these sprayers tend to wear out over time, so even low-flow sprayers may ultimately end up being very inefficient. In areas where these inefficient sprayers are used, upgrading to low-flow sprayers can conserve water while also reducing the energy needed to maintain the supply of hot water. An easy way to tell if you should replace your sprayer is to use it to fill up a 1-gallon water pail—if it takes less than about 30 seconds, it's a good idea to replace it. Given the



small initial cost of low-flow valves (around \$60 per valve), this measure typically yields a simple payback of less than two months.

Cooling towers. Cooling towers are used to remove heat from chilled-water HVAC systems and work by employing evaporative cooling. In addition to the water lost from evaporation, additional water is lost through bleed-off, where a portion of the circulating water is discharged from the system to remove solids that have built up over time.

Upgrading the water-treatment system for cooling towers—thereby reducing the number of times bleed-off is necessary—can mean large savings from reduced water consumption, chemical consumption (for water treatment), and labor costs for maintenance, and from the energy savings that will result from cleaner heat-transfer surfaces. These upgrades may include the installation of automatic controls to monitor water pH levels and the concentration of dissolved solids, and to add chemicals or bleed off water as appropriate. Upgrades could also include makeup and blow-down submeters, side-stream filtration, ozonation, and high-bonding chemical or physical treatment. Though the actual savings from upgrades will depend on the individual cooling tower system, payback periods can be as short as six months, according to the Saving Water Partnership, a group of Oregon utilities that promote water conservation.

Saving Water Outdoors

Outdoor water use represents roughly a quarter of overall water consumption for businesses. It is prone to a number of problems that can waste large amounts of water each year—and, unless the grass or plants begin to look unhealthy, it can be hard to tell when water isn't being used effectively.

Many businesses use inefficient irrigation techniques, including sprinklers that turn on even when it's raining, those that water the sidewalk instead of the grass, or broken or leaky plumbing and sprinkler heads. As a result, an easy first step in saving water is to inspect the irrigation system to see if anything is out of place or operating ineffectively. Maintenance

personnel may also be able to tell if water isn't being used effectively because it will generally result in runoff, soggy or dry spots, and even turf that is a little too healthy. If the system is set up properly, installing smart irrigation controls can yield further water savings.

Smart irrigation controls currently offer a number of features, ranging from simple rain and soil-moisture sensors to complex computer modeling systems that incorporate weather data, seasonal water use information, and even the physical layout of plants to be watered. Because many of these systems offer different features and prices, it's difficult to estimate the economics for a typical business. However, typical irrigation water savings range from 20 to 50 percent, according to the U.S. Department of the Interior's Bureau of Reclamation.

General Strategies

Although the measures described so far do a good job at saving water in specific situations, it's also important to look at the building system as a whole to reduce your facility's water consumption.

Check for leaks. A single faucet, shower, or pipe leaking at a rate of one drip per second can waste over 3,000 gallons of water annually; a leaky toilet can waste over 70,000 gallons and cost \$300 each year, according to WaterSense. Fortunately, it's generally a straightforward process to check for and repair leaks. Though a leaky faucet or shower may be easy to spot, a leaky toilet may not be. A simple way to see if a toilet is leaking is to add food coloring to the tank—if color appears in the bowl within half an hour (without flushing), there's a leak. (When using this method, make sure to flush after you've completed testing, or the food coloring may stain the ceramic.)

Although a plumber can be called in for repairs if leaks are found, it may not be necessary—faucets, showerheads, and toilets are typically easy to fix without one. Because replacement parts tend to be inexpensive and readily available, adopting a “do-it-yourself” approach when applicable can save your company additional money.

Get a water audit. Water audits are useful for analyzing a building's water use and identifying areas for efficiency improvement that may not otherwise be obvious. In many cases these audits are completely free, and they can lead to immediate savings as a result of implementing the recommended measures. Contact your local water utility for more information.

Additional Resources

The EPA's Energy Star program (www.energystar.gov/index.cfm?c=appliances.pr_appliances) allows manufacturers to label appliances that meet standards for energy efficiency. In some cases, these appliances can also help businesses to save water.

Portfolio Manager (www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager), a software

package available free from Energy Star, allows you to monitor multiple water meters, track a facility's water use over time, and compare water consumption with similar facilities.

WaterSense (<http://epa.gov/watersense>), a labeling program similar to the Energy Star label for energy efficiency, aims to help customers choose water-efficient products.

The American Water Works Association (www.awwa.org) provides information on water resource development, water and wastewater treatment technology, water storage and distribution, and utility management and operations.

The U.S. Department of Energy's Energy Efficiency and Renewable Energy web site (<http://www1.eere.energy.gov/calculators/homes.html>) provides several calculators to analyze lifetime savings resulting from the implementation of various water-saving technologies.

