

# **Green Restaurant Guide: Water Conservation**

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## 1. Purpose of This Guide

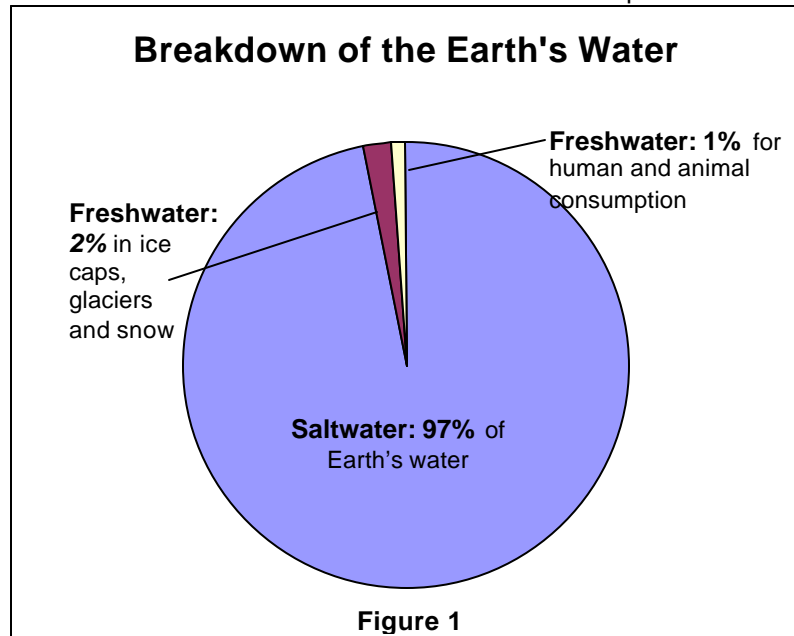
The purpose of this guide is to assist new and existing food service facility owners and managers with establishing and maintaining a water conservation program. The guide provides resources and ideas on free services available and measures to take to start greening your operations and your bottom line.

If you have enrolled in the **San Francisco Green Business Program** for environmental assistance and award recognition, follow all sections of the Green Restaurant Guide to fulfill the measures on the checklist. For information about the San Francisco Green Business Program, please visit [www.sfgreenbiz.org](http://www.sfgreenbiz.org) or call 415-355-3700.

## 2. Why Conserve?

Between 1950 and 2000, the U.S. population nearly doubled but public demand for water more than tripled.<sup>i</sup> The increased demand for water has put further stress on water supplies, adversely affecting both human health and the environment.<sup>ii</sup> Our planet's fresh water reserves are limited, despite the fact that 70% of the Earth's surface is covered by water. In reality, 97% of the water found on Earth is salt water in the oceans. The remaining 3% is fresh water with 2% is trapped in ice caps, glaciers and snow on mountain ranges. What is left is the 1% fresh water that is available for human consumption.<sup>iii</sup>

**Water plays a crucial role from cooking to aesthetics of a restaurant. Conserving water helps your bottom line and the environment as well.**



Water consumption can also have a direct relationship to energy consumption. For restaurants, conserving hot water is a smart idea because you trim down two bills: water and the electricity or natural gas used to heat it. For example, steamers that use water for heat transfer are especially costly to operate because the appliance's energy consumption is driven by its water consumption. In a comparison between a three-pan connectionless steamer and a traditional, boiler based steamer, the connectionless steamer increased the annual water savings by \$2,000 and electricity savings by \$3,000.<sup>iv</sup> Here's another example: incorporating water-cooled refrigerators and ice machines into a recirculating closed loop cooling system can save up to 5.3 million gallons of water per year valued at \$26,500.<sup>v</sup>

Even using cold water requires energy. American public water supply and treatment facilities consume approximately 56 billion kilowatt-hours per year.<sup>vi</sup> In addition to the electricity used to power the plants, the chemicals used to treat water can also emit carbon dioxide. Carbon dioxide is the key greenhouse

gas responsible for global warming concerns. In order to minimize emissions, businesses need to reduce both energy and hot water consumption.

In this guide we share with you many cost-effective ways to reduce water consumption in your restaurant while not compromising your appliances/equipments' performance; cleanliness of the kitchen and most importantly, the quality of the food.

### 3. Four Steps to Starting Your Water Conservation Program

**Step 1:** Have your water provider (e.g. San Francisco Public Utilities Commission) or any of the below listed providers conduct a free audit of your facility's water use and provide you with specific suggestions for conservation.

#### **San Francisco Public Utilities Commission (SFPUC)**

**FREE** on-site surveys. SFPUC will survey your San Francisco food service facility to show you how to save money on your water bill. Due to the limited staff for onsite screenings, there may be a waiting period before your establishment will receive your water audit.

Contact SFPUC if you're interested in a basic water audit or if you would like **rebates** for water efficient equipment and appliances.

Call: 415-551-4730 to schedule your water audit walk-through.

For more information: [www.sfwater.org](http://www.sfwater.org)

#### **Food Service Technology Center (FSTC)**

**FREE** on-site surveys of appliances and equipment that heat water only. FSTC will survey your Bay Area food service facility to show you how to save money on your energy bill and your water bill. The thorough free evaluation is followed up with a short report summarizing the areas for potential savings. Due to the limited staff for onsite screenings, there may be a waiting period before your establishment will receive your hot water audit.

Contact the FSTC if you're interested in a hot water audit and considering buying new kitchen appliances. FSTC specializes in commercial kitchen energy efficiency and kitchen appliances and will help you select the most energy efficient appliances plus inform you regarding rebates.

Call: 1.800.398.3782

For more information: <http://fishnick.com>

**Step 2:** Create employee support. Ask your staff for their input and assistance on what can be done to conserve water. If you have more than 10 employees, find out who of your employees would like to champion the water conservation program. Progressive restaurants have learned that successful water conservation programs need a champion – someone to inspire employees and lead the charge.

**Step 3:** Work with the SFPUC representative on implementing measures recommended (from the free SFPUC water audit) and develop employee training to reduce your water use.

**Step 4:** Integrate the program into your company procedures and reward programs (for example: include water conservation measures in employee job duties, develop "green" reward system, make water conservation part of your job reviewing process).

**Maintenance:** Monitor, record and post rates of restaurant water use. Make repairs or replace equipment when rate changes indicate problems. Review program every 12 months and identify additional opportunities to improve water savings.

## 4. Top 5 Actions Restaurants Can Take to Conserve Water

### 1. The key to water efficiency is to be able to control and predict your water use.

Your water meter is an effective tool to assess whether you need to reduce water usage as well as to monitor leaks. Don't ignore little leaks. A leaky faucet or dish machine, or a stuck solenoid valve that loses one-tenth of a gallon per minute may cost you more than 50,000 gallons of water wasted in a year.<sup>vii</sup> To learn how to monitor leaks, please visit <http://www2.sfenvironment.org/greenbiz/how.htm> and click "Water Conservation Guide". Reduce the amount of water used and repair leaks in taps, pipes, etc.

### 2. Retrofit

Retrofit older and inefficient appliances such as toilets and faucets. Standard toilets made after 1997 use only 1.6 gallons per flush (gpf) whereas toilets made before 1997 typically use 3.5- 7.0 gpf. Ultra low flow toilets can operate efficiently with as low as 1.0 gpf. Ask the SFPUC if **rebates** on new equipment or free water-saving devices are available.

### 3. Switch to low-flow pre-rinse spray valves, faucets, toilets and urinals.

Low-flow valves will help you save with your water, energy AND wastewater disposal bills. Low-flow valves are designed to work as well as or even better than the standard valves, and the SFPUC offers free low-flow systems replacements. Call SFPUC: 1-800-563-5874. If you currently have self-closing, sensor-operated faucets, switch to a standard low flow system. Recent studies have shown that motion-detecting faucets can actually use twice as much water as manually operated faucets.

### 4. Add aerators.

Hand sink faucets without aerators can use up to 10 gallons of water per minute. Add water efficient aerators to your faucets in your kitchen and bathrooms to limit the water use and water-heating costs.

### 5. Add insulation.

Heating water cost is major expense for most restaurants. A simple solution to this is to add insulation to your hot water system. Insulated covers used to wrap your hot water pipes, available at most hardware stores, are cost-efficient and can greatly reduce energy and water expenses.

## 5. More Tips for Water Conservation

Follow the tips below for maximum energy conservation. These suggestions are grouped by equipment and operational areas, listed alphabetically.

Free/Behavioral Change= ☺

Low Cost= \$

Investment= \$\$

**gpm= Gallons Per Minute**

**gpf= Gallons Per Flush**

General Suggestions	
☺	Monitor your water bill monthly for indicators of leaks, spikes or other problems. Call SFPUC water conservation section, 415-551-4730, for a free water walk-through if you notice any unusual increases in use or if you are looking for suggestions on how to improve the efficiency of your water use.
☺	Learn how to read your water meter. Read it twice a day for early detection of water consumption spikes that may indicate leaks or other high use problems.
☺	Create a checklist for possible "leak areas" (e.g. toilets, faucets etc.) in your facility. Use the checklist on a regular basis.
Cooling	

San Francisco Department of Public Health Green Restaurant Guide

\$	Coolers, chillers and ice machines: water-cooled ice machines and refrigeration equipment should be replaced with air-cooled units or units that are cooled by a closed loop of water. Savings can be over \$1,000 per year.
\$	Retrofit once-through water cooled refrigeration units, air conditioners, and ice machines by using temperature controls and a re-circulating chilled water loop systems.
<b>Dishwashers</b>	
\$\$	Check with manufacturer to see if dishwasher spray heads can be replaced with more efficient heads or if flow regulators can be installed without voiding manufacturer sanitation warranty. In conveyer type washer, ensure that water flow stops when there are no dishes in the washer. Install a sensing arm or ware gate that will detect the presence of dishes and shut off water when there are no dishes on the conveyer. Evaluate reuse of rinse water for garbage disposer or scrapper trough.
😊	Operate dishwashers with full loads only and shut off when they are not in use.
😊	Look for leaks; leaks can cost hundreds of dollars a year.
😊	Reduce the water volume in the dishwasher by use of a pressure regulator. Check to make sure the dishwasher is not using more water than the manufacturer specifies.
<b>Employee Practices</b>	
😊	Shut off water-cooled air conditioning units when not needed.
😊	Turn off preparation faucets that are not in use.
😊	Do not use constantly running water to melt ice in bar sink strainers or to thaw or rinse food. Instead, plan ahead and use a refrigerator to gradually thaw frozen food.
😊	Hand scrape dishes before loading into dishwasher. If necessary, use pre rinse spray valve.
😊	Soak dirty pots and pans instead of rinsing them in running water.
😊	Wash vegetables in ponded water; do not let water run in preparation sink.
😊	Implement a water conservation policy for food servers. Serve water in bars and restaurants only upon request to reduce wash and ice loads. Provide information at each table regarding the reasons for such measures.
😊	Recycle water whenever feasible and consistent with regulatory requirements. Permit required for grey water plumbing (recycling) systems in California.
<b>Equipment/Facility Changes</b>	
😊	Whenever possible, replace appliances and equipment with water-saving models.
\$	Replace existing spray valves with efficient, high-velocity models.
\$\$	Replace water-cooled ice machines with air-cooled models.
<b>Garbage Disposal/Compost</b>	
😊	Disconnect your garbage disposal. Scrape food waste into compost. This saves water and energy.
\$\$	Install a foot pedal or other manual controls, such as a solenoid valve, to shut water off when the disposal unit is not operating.
\$	Set up your own composting system for fruit and vegetable waste. This will save water and energy, and the composted food waste will create a beneficial soil amendment.
😊	Evaluate reuse of rinse water for garbage disposer or scrapper trough.
<b>Landscape</b>	
\$	Landscape with drought resistant plants. Use ground cover or mulch around landscape plants to prevent evaporation.
\$	Use a low-volume irrigation system such as drip systems or soaker hoses.
😊	Avoid runoff by making sure sprinklers are directing water to landscaped areas and not to parking lots, sidewalks or other paved areas.
😊	Apply water, fertilizer, or pesticides to landscape only when needed rather than on an automatic schedule. Look for signs of wilt before watering established plants. Ensure your landscaper implements this practice.

Restrooms	
\$	Install California Plumbing Code conforming aerators on all faucets. Many restroom faucets use 2.5 to 5 gallons per minute. Low-flow faucets are affordable and can reduce the flow to under 1.5 gallons per minute. Ask SFPUC if free aerators are available.
\$	Replace existing toilets and urinals with plumbing code conforming high efficiency toilet (HET) or ultra low flush (ULF) models. These toilets use as little as 1.2 (gpf), and urinals can use down to 0 gpf.
\$\$	Replace all pre-1992 toilets with 1.6 gpf or fewer toilets. Provide additional urinals in men's restrooms & reduce number of toilets.
😊	Post signs in restrooms/lavatories to remind customers and staff to not use the toilet as a trash can; only toilet paper belongs in the toilet. Any material other than toilet paper will force the septic tank to use more water to flush the material down the drain.
Washing and Cleaning	
\$\$	Install manual triggers on all sink spray hoses so that water is used on demand only.
\$	When manually washing dishes, use the three compartment sink for dipping dishes and equipment, instead of using running water.
😊	Reduce pre-wash spray fixtures to minimum.
😊	Turn off continuous flows or unnecessary flows in areas such as food preparation and wash down.
😊	Check flow of water to scrapper trough and reduce to minimum. In larger establishments consider a conveyor-type scrapper system.
😊	Consider sweeping and mopping to reduce spray washing of interior and exterior spaces.
\$	Install low flow aerators with flow rates not to exceed 1.5 gpm for sink faucets.
\$	Use "dry" sweeping, water efficient "spray brooms", or low flow (<3 gpm) spray nozzles with automatic shut-off rather than a garden hose to wash down concrete or asphalt surfaces.

## 6. Purchasing Suggestions for Water Conservation

- For lists of equipment **rebates and free services** visit [www.sfwater.org](http://www.sfwater.org) (see under Water- Water Conservation – For Business), <http://www.cuwcc.org/smart-rebates-main.aspx> or call 800-LO-FLUSH.
- Look online for efficiency information on specific manufacturers and models. Visit these three websites:
  - EPA's WaterSense <http://www.epa.gov/owm/water-efficiency/pp/index.htm>
  - California Urban Water Conservation Council [http://www.cuwcc.org/products/commercial-food-services-main.aspx?ekmense=b86195de\\_24\\_52\\_7878\\_1](http://www.cuwcc.org/products/commercial-food-services-main.aspx?ekmense=b86195de_24_52_7878_1)
  - PG&E's Food Service Technology Center [www.fishnick.com](http://www.fishnick.com)
- Always ask equipment manufacturers and dealers for water use information and about maintenance. In some cases, water-efficient equipment may require less upkeep than standard efficiency equipment.
- Buy WaterSense™ labeled products whenever possible.
- Look beyond the sticker price. Make a water-smart purchase by thinking in terms of life-cycle cost, which include purchase price (Commercial Rebates, Incentives and Services available for water-efficient equipment), annual water usage costs and other long-term costs associated with the equipment. The investment now will repay with increased annual savings.

## 7. Water Savings Measurement Tools

**Pre-Rinse Spray Valve Calculator:** <http://www.fishnick.com/tools/watercost>

This online tool from the Food Service Technology Center estimates the amount of water and money you save with low-flow pre-rinse spray valves and other water conserving devices.

**WATERGY Software:** [http://www1.eere.energy.gov/femp/information/download\\_watergy.html](http://www1.eere.energy.gov/femp/information/download_watergy.html)

This free software from the US Department of Energy analyzes a facility's potential water and associated energy savings. The business inputs utility data (energy and water cost and consumption data for the most recent twelve months) and operations data (number and kind of water consuming/moving devices and their water consumption and/or flow rates). The software estimates water and energy annual savings, as well as costs and payback times for various conservation methods.

**WaterWiser Drip Calculator:** <http://www.awwa.org/awwa/waterwiser/dripcalc.cfm>

This online tool from the American Water Works Association will help you calculate the amount of water wasted through leakage. A leak may seem minor, but by the end of a month it can add up to a significant cost.

## 8. They Did it – So Can You! Case Studies

### Dishware Sensing Gate<sup>viii</sup>

The installation of dishware-sensing gate in dishwashers gives Anthony's Pier 4 in Boston, MA the opportunity to save approximately 225,000 gallons of water annually. The initial investment is \$1,200 for the device and \$2,700 is saved per year on heating water costs. The payback time is just five months.

### Air-Cooled Machines<sup>ix</sup>

SFPUC recently executed a contract to replace water-cooled ice machines with air-cooled machines at the Fairmont Hotel. The conversion will save the hotel over \$100,000 and conserve about 24 acre feet of water annually.

### Urinals instead of Toilets<sup>x</sup>

By replacing the seventeen flushometer toilets and seven flushometer urinals from Anthony's Pier 4 in Boston, MA with ULF models, they saved 1.1 million gallons of water worth \$8,500 annually. The project cost was \$6,700 and the payback of the initial investment was less than ten months.

## 9. Glossary

**High-Efficiency Toilets (HET)** flush at 20 percent below the 1.6gallons-per-flush (gpf) U.S. maximum or less, equating to a maximum of 1.28-gpf. (The HET category includes dual-flush toilets.) The average water savings for HETs is estimated to be 38 gallons per day (gpd) when replacing a non-ULFT and 7 gpd when replacing a ULFT.

[http://www.cuwcc.org/smartrebates/smartrebates\\_utilities\\_detail.lasso?UID=32](http://www.cuwcc.org/smartrebates/smartrebates_utilities_detail.lasso?UID=32)

**High-Efficiency Urinals (HEU)** function at 0.5 gpf or less. (The HEU category includes non-water urinals) Based on data from actual usage, these urinals save 20,000 gallons of water per year with an estimated 20-year life. In addition to saving water and sewer costs, non-water urinals are an improvement over traditional urinals in both maintenance and hygiene.

[http://www.cuwcc.org/smartrebates/smartrebates\\_utilities\\_detail.lasso?UID=32](http://www.cuwcc.org/smartrebates/smartrebates_utilities_detail.lasso?UID=32)

**Ultra-low-flush toilets (ULF)** use no more than 1.6 gpf, rather than 3.5 to 7 gallons of water used by older designs. The required minimum was set to 1.6 gpf in 1997 for commercial use.

[http://www.fypower.org/res/tools/products\\_results.html?id=100139](http://www.fypower.org/res/tools/products_results.html?id=100139)

**Waterless/No-Flush Urinals** work completely without water or flush valves. They save up to 45,000 gallons of water per year per urinal. <http://www.waterless.com/>

**WaterSense**, a partnership program sponsored by the U.S. Environmental Protection Agency, makes it easy for Americans to save water and protect the environment. Look for the WaterSense label to choose quality, water-efficient products. <http://www.epa.gov/owm/water-efficiency/index.htm>

## **Credits**

Thank you to Heike Bridgwater and Ivy Wong for your dedication and extensive contributions to this guide.

Information and guidelines from the San Francisco Green Business Program DIY guide and checklist were used in this guide.

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i <http://www.epa.gov/owm/water-efficiency/water/why.htm>

ii <http://www.epa.gov/owm/water-efficiency/water/why.htm>

iii <http://www.fcgreenhouse.net/NewLeafKids.pdf>

iv [http://www.fypower.org/pdf/BPG\\_RestaurantEnergyEfficiency.pdf](http://www.fypower.org/pdf/BPG_RestaurantEnergyEfficiency.pdf)

v <http://www.mwra.com/04water/html/bullet3.htm>

vi [http://www.epa.gov/owm/water-efficiency/water/save/env\\_benefits.htm](http://www.epa.gov/owm/water-efficiency/water/save/env_benefits.htm)

vii [http://www.ec.gc.ca/water/en/info/pubs/FS/e\\_FSA6.htm](http://www.ec.gc.ca/water/en/info/pubs/FS/e_FSA6.htm)

viii <http://www.mwra.com/04water/html/bullet3.htm>

ix [http://sfwater.org/detail.cfm/MC\\_ID/13/MSC\\_ID/168/MTO\\_ID/356/C\\_ID/4250](http://sfwater.org/detail.cfm/MC_ID/13/MSC_ID/168/MTO_ID/356/C_ID/4250)

x <http://www.mwra.com/04water/html/bullet3.htm>