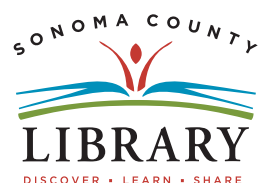




# THE DO-IT-YOURSELF ENERGY AND WATER SAVINGS GUIDE

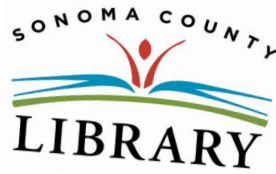
This toolkit is designed for library patrons and will help you save money on your utility bills while conserving vital resources.





## DO-IT-YOURSELF

### Home Energy and Water Savings Toolkit



Dear Sonoma County Residents,

When community agencies work together, we can produce much more than we could alone. The Do-It-Yourself Home Energy and Water Savings Toolkit is a perfect example of just such a partnership. The Energy and Sustainability Division of Sonoma County, Sonoma Clean Power, the Sonoma-Marín Saving Water Partnership, and Sonoma County Library have come together to offer this resource to our residents.

These DIY kits represent the Library's commitment to environmental sustainability and are both an excellent addition to our collection and an important resource for our community. Hopefully this tool will help you better understand the energy and water usage areas of your home and provide you with information to make changes that could save energy, water, and money.

Many thanks to our partners and we hope this resource serves you well.

Thank you,  
Sonoma County Library

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# INTRODUCTION

## **Do-It-Yourself (DIY) Home Energy and Water Savings Toolkit Program**

The Sonoma County Library, Sonoma Clean Power (SCP), the Sonoma – Marin Saving Water Partnership (SMSWP), and the Sonoma County Energy and Sustainability Division have partnered to bring you a Do-It-Yourself (DIY) Home Energy and Water Savings Toolkit. The kit will help you take charge of your home’s energy and water use in order to reduce your utility bills.

This User Guide will provide additional tips for “going green” in your daily life. Whether your goal is to save money, protect the environment, or embark on a fun home project, we invite you to turn the pages and learn all you can.

## **Sonoma County Energy and Sustainability Division**

Increasing the efficiency of your home is more than switching out light bulbs or buying new appliances. It’s approaching your home as a complete system with building shell (walls, ceiling, and floor), insulation, heating/cooling equipment, water, and other energy features working together to reduce energy use and help lower your utility bills. The Sonoma County Energy and Sustainability Division connects you to the experts and resources you need to take a “whole house” approach. To learn more, visit [www.sonomacounty.ca.gov/energy](http://www.sonomacounty.ca.gov/energy).

**This symbol indicates steps where you will use the Toolkit tools and equipment**



# DIY TOOLKIT CONTENTS

## Equipment – For You to Keep and Install in Your Home



### 4 Light-Emitting Diodes (LEDs) bulbs

Use to replace incandescent bulbs and CFLs in high-use fixtures.



### Weatherstripping

Helps seal air gaps in windows and doors.



### Outlet Gaskets

Use to seal the void around your outlets and prevent heat loss.



### Low-Flow Showerhead

Replace your current showerhead with this.



### Rubber bands

Wraps around the pliers to help prevent scratching the aerators or showerhead during installation.



### 3 Low-Flow Faucet Aerators

Two 0.5 gpm aerators for your bathroom sinks and one 1.5 gpm aerator for your kitchen sink. These aerators are a standard size (15/16") and will fit most faucets, but may not fit specialty ones.



### Water Leak Detection Dye Tablets

(not for consumption) Identify leaks in your toilet tanks.



### Water Flow Rate Bag

Measures the true rate of flow in gallons per minute of your faucets and showers

## Tools – To Be Returned to the Library Once You are Finished with the Kit



### Kill-A-Watt® Meter

Measures the energy use of appliances and equipment, and helps you understand your home's "plug load" as a share of overall energy use.



### Thermometer

Checks the temperature of your hot water supply.



### Infrared Laser Thermometer

Checks for heat loss in trouble spots such as windows, vents, and door jams.



### Pliers

Helps replace old faucet aerators and showerheads with new ones.



### Refrigerator Thermometer

Enables you to monitor the temperature in your refrigerator and freezer.



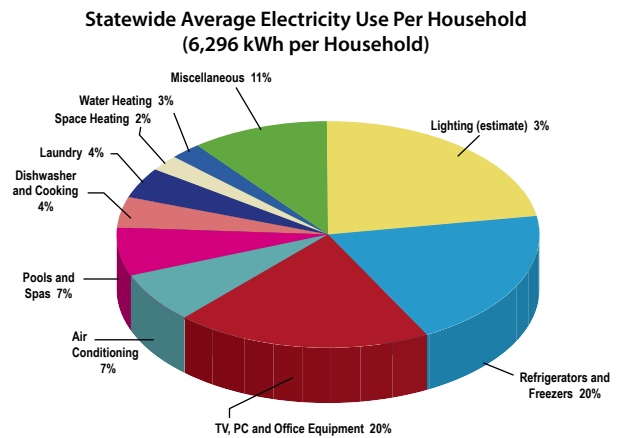
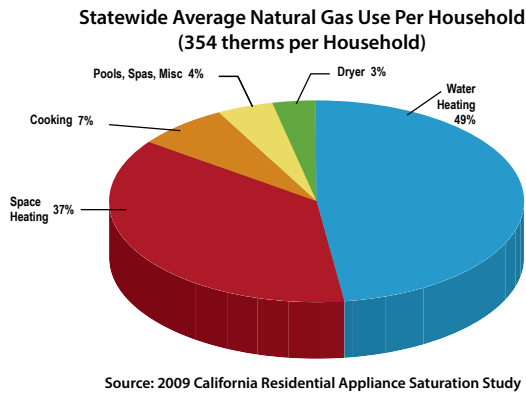
### Pipe Thread Seal Tape (plumber's tape)

Prevents leaks in your faucets and showerheads.

# INTRODUCTION TO ENERGY USE

## Average Household Use of Energy in California

Knowing how energy is used in your home will help you take steps to reduce your use. These pie charts show how the average household in California uses electricity and natural gas.



## How Much Energy Will This Toolkit Help Me Save?

We all use our homes and appliances differently, so predicting the precise amount of energy savings that you can achieve by using this Toolkit is difficult. For example, EnergyStar® estimates that replacing one incandescent bulb with an EnergyStar® Certified CFL or LED bulb can save you anywhere from \$40 to \$135 in electricity costs over the bulb's life — the actual amount depends on how often you use the light, your electricity rate, and more.

## Energy Literacy: Understanding Units That Measure Energy

**Watt (W)** - A watt is the basic unit of power used to measure electricity capacity and is equivalent to one joule per second. Incandescent light bulbs are rated on their capacity to produce light — the higher the rating (e.g., 40, 60, 100W), the brighter the light. LED bulbs use far less watts to produce the same amount of light.

**Kilowatt (kW)** - A kilowatt is 1,000 watts.

**Kilowatt hour (kWh)** - A kilowatt hour is 1,000 watts used for one hour (power x time). It is

the unit of energy most commonly used on household electricity meters. For example, a 100W incandescent bulb left on for 10 hours is equal to 1 kWh (100W x 10 hrs = 1,000 Wh = 1 kWh). In 2015, the typical Sonoma Clean Power residential customer used 510 kWh per month per household.

**Therm** - A therm is the energy equivalent of burning 100 cubic feet of natural gas. The PG&E residential customer uses an average of 34 therms per month per household.

# UNDERSTANDING YOUR ENERGY BILL

## Sonoma Clean Power (SCP) Bill Features

SCP provides you with cleaner electricity than was available prior to its existence — at competitive prices. SCP buys electricity generated from at least 49 percent renewable sources and that electricity is delivered to your home or business via transmission lines (“the grid”) which are maintained by PG&E.



**ENERGY STATEMENT**  
www.pge.com/MyEnergy

Account No: 1023456789-0  
Statement Date: 04/09/2017  
Due Date: 04/30/2017

**Service For:**  
MICHAEL JOSEPH  
281 TALON DR  
FORT BRAGG, CA 95437

**Your Account Summary**

Credit Balance on Previous Statement	\$257.34
Payment(s) Received Since Last Statement	-257.34
Previous Unpaid Balance	0.00
<b>Current PG&amp;E Electric Delivery Charges</b>	<b>\$81.02</b>
<b>Sonoma Clean Power Electric Generation Charges</b>	<b>34.05</b>
Current Gas Charges	92.65
<b>Total Amount Due by 03/30/2017</b>	<b>\$207.72</b>

**Questions about your bill?**  
24 hours per day, 7 days per week  
Phone: 1-866-743-0335  
www.pge.com/MyEnergy

**Local Office Address**  
100 N. MAIN ST  
FORT BRAGG, CA 95437

**Monthly Billing History**  
Daily Usage Comparison



**ENERGY STATEMENT**  
www.pge.com/MyEnergy

Account No: 1023456789-0  
Statement Date: 04/09/2017  
Due Date: 04/30/2017

**Details of PG&E Electric Delivery Charges**  
03/02/2017 - 03/31/2017 (30 billing days)  
Service For: 281 TALON DR  
Service Agreement ID: 2416854841  
Rate Schedule: E1 X Residential Service

**Service Information**

Meter #	1005868421
Current Meter Reading	51,775
Prior Meter Reading	51,285
Total Usage	510.000000 kWh
Baseline Territory	X
Heat Source	Not Electric
Serial	H
Rotating Outage Block	50

**03/02/2017 - 03/31/2017 Your Tier Usage**

Tier	Usage	Rate	Amount
Tier 1 Allowance	327.00 kWh (30 days x 10.9 kWh/day)		
Tier 1 Usage	327.000000 kWh @ \$0.19979	\$65.33	
Tier 2 Usage	183.000000 kWh @ \$0.27612	50.53	

**Generation Credit** -50.17  
**Power Charge Indifference Adjustment** 15.04  
**Franchise Fee Surcharge** 0.30

**Total PG&E Electric Delivery Charges** **\$81.02**

2014 Vintaged Power Charge Indifference Adjustment

**Electric Usage This Period: 510.000000 kWh, 30 billing days**  
Average Daily Usage 17.00

- Account Number:** This PG&E account number is needed to sign up for EverGreen service or to opt out and return to PG&E. Just use the 10 digits before the dash.
- PG&E Electric Delivery Charges:** This is PG&E’s charge for the delivery of electricity. It includes transmission, distribution, and a variety of other fees. It does NOT include generation charges if you’re an SCP customer.
- Sonoma Clean Power (SCP) Electric Generation Charges:** This is SCP’s charge for generation – the cost of procuring the electricity you use.
- Generation Credit:** This number is the amount that PG&E would have charged you for Electric Generation. This number is helpful in comparing SCP’s electric generation cost to PG&E’s electric generation cost.
- Power Charge Indifference Adjustment:** This fee is required by PG&E of all Sonoma Clean Power customers. It is intended to ensure that customers who switch to SCP pay for the above-market cost of energy that PG&E bought on their behalf prior to the change in service.



# UNDERSTANDING YOUR ENERGY BILL

## Sonoma Clean Power Bill Features (continued)

6. **Franchise Fee Surcharge:** This fee is collected by PG&E to pay for the right to use public streets to run gas and electric service.
7. **Total PG&E Electric Delivery Charges:** This is the sum of PG&E's charges for electric delivery, which matches the charge on the summary page of your bill.



ENERGY STATEMENT		Account No: 1023456789-0	
www.pge.com/MyEnergy		Statement Date: 04/09/2017	
		Due Date: 04/30/2017	
<b>Details of Sonoma Clean Power Electric Generation Charges</b>		<b>Service Information</b>	
03/02/2017 - 04/01/2017 (31 billing days)		Total Usage 510.000000 kWh	
Service For: 281 TALON DR		For questions regarding charges on this page, please contact:	
Service Agreement ID: 2108961496 ESP Customer Number:1234567890		Sonoma Clean Power	
		P.O. Box 1030	
		Santa Rosa, CA 95402	
		1-855-202-2139	
		www.sonomacleanpower.org	
<b>03/02/2017 - 04/01/2017</b>			
<b>Rate Schedule: E-1</b>			
GENERATION - TOTAL	510.000000 kWh @ 0.06648	\$33.90	
	NET CHARGES 33.90		
Energy Surcharge		\$0.15	
<b>Total Sonoma Clean Power Electric Generation Charges</b>		<b>\$34.05</b>	

8. **Rate Schedule:** This indicates the applicable rate schedule under which you are receiving electric generation service from Sonoma Clean power (SCP). This rate schedule will specify applicable charges for such service and can be reviewed online at [www.sonomacleanpower.org](http://www.sonomacleanpower.org) for residential and commercial service.
9. **Energy Surcharge:** This fee is collected on behalf of the California Energy Commission and applies to all customers, regardless of service provider.
10. **Total Sonoma Clean Power (SCP) Electric Generation Charges:** This is the sum of all electric generation charges from SCP and matches the charge on the summary page of your bill.

More questions? Contact SCP at (855) 202-2139 or go to [www.sonomacleanpower.org](http://www.sonomacleanpower.org).

# REDUCING ENERGY USE: APPLIANCES

Consumer electronic products account for up to 15 percent of electricity consumption in a typical California household. Many small appliances and electronics use energy even when they are turned off — as much as 75 percent may be consumed in standby or off mode! This is known as “vampire” or “phantom” loads, and eliminating them is a great way to save energy.



## STEP #1: USE THE KILL-A-WATT® METER

The Kill-A-Watt® meter measures the energy drawn by appliances and electronics in both operating and standby modes. Follow these steps:

1. Plug the meter into an outlet and plug an appliance or electronic device you'd like to measure into the meter. You may need to wait a couple seconds for the energy to register.
2. Push the “Reset” button until “Watt” appears on the unit.
3. Measure the wattage when the appliance is both on and off.
4. Check your energy bill to verify your electricity rate.
5. The meter can also help you estimate the cost of electricity used by the appliance or device over time. See the video below for instructions.



Tool: Kill-A-Watt® EZ Meter

**Instructional Video:** How to Use a Kill-A-Watt® EZ Meter.

Scan the QR code with a smart phone to view the video or visit: <http://goo.gl/3Mv1Ku>



Average Energy Consumption of Standard Appliances\*

Appliance	Watts
Clothes Dryer	1,800-5,000
Clothes Washer	350-500
Clothes Iron	1,000-1,800
Computer	270 awake 60 asleep
Dishwasher	1,200-2,400
Heater	750-1,500
Microwave	750-1,100
Refrigerator	725
Toaster	800-1,400
Flatscreen TV	120
Vacuum Cleaner	1,000-1,440
DVD Player	20-25

\*Actual energy usage depends on the age and model of the appliance.

### TIPS:

- Unplug small appliances (toasters, coffee pots, etc.) when not in use.
- Unplug phone and battery chargers once they are fully charged.
- In your entertainment and computer areas, plug equipment into a Smart Strip, which will shut off equipment when in standby mode. NOTE: Unplugging your cable box may reset the system; be sure to consult the operation manual.
- Always look for the EnergyStar® logo when buying new appliances.



Smart Strip

## DO-IT-YOURSELF

### Home Energy and Water Savings Toolkit

Major appliances may account for a quarter of your household energy costs, and your refrigerator is likely to be the single biggest plug load in your home. Using the Kill-A-Watt® meter, you can compare the energy use of your appliances to the average use as outlined in the table on page 6. Then follow the tips below.



## STEP #2: MEASURE THE REFRIGERATOR TEMPERATURE



Use the Refrigerator Thermometer to help set optimum temperatures for your refrigerator and freezer:

1. Place thermometer in refrigerator between several food items. After 20 minutes, check thermostat reading.
2. Look and test for cracks in the door seal using an incense stick:  
<https://goo.gl/isMCVb>
3. Repeat these actions with the freezer.
4. Adjust temperatures if they are outside the target range:
  - 36-40°F for refrigerator
  - 0-5°F for freezer

### TIPS:

#### REFRIGERATOR

- Regularly clean the coils on your refrigerator.
- Leave your refrigerator plugged into a Kill-a-watt meter (included in the kit) for 24 hours.
- Keep contents organized so you can quickly get what you need; minimizing the amount of time the doors are open will save energy.
- If you have a second refrigerator, consider donating it or having it properly disposed of by your waste hauler, and you may be eligible for a PG&E rebate!

#### WASHER & DRYER

- Wash full loads and use short wash cycles for mildly dirty laundry.
- Use cold water whenever possible.
- Use the washer's high spin cycle to reduce drying time, and try a clothesline instead of the dryer, which is a big energy user.
- Clean the lint trap after every use to ensure safe, efficient drying.

#### HEATING & COOLING SYSTEMS

- Do not rely on space heaters, which are very inefficient.
- Clean and replace filters regularly.
- Set your winter heating temperature at 68°F; set your summer cooling temperature at 78°F.
- Use window coverings to prevent heat gains during the summer and heat loss during the winter.
- Circulate air with ceiling or portable fans.
- Replace older A/C units (more than 10 to 15 years) with EnergyStar® appliances that could reduce your costs by 20 to 40 percent!

### Did you know?

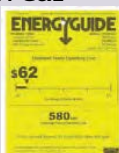
You Can Save With EnergyStar® Appliances!

EnergyStar® appliances typically use up to 50 percent less energy and water than standard models. Look for the EnergyGuide label; it provides an estimated yearly operating cost and the range of operating costs for similar models.



### Rebates! Rebates!

Check with PG&E for rebates on your EnergyStar® appliance purchase. PG&E may also pay to pick up your old refrigerator or A/C unit. Call 1-800-299-7573 or visit <http://goo.gl/jTb2Vq> for eligibility and pickup.



# REDUCING ENERGY USE: LIGHTING

Lighting represents as much as 22 percent of your home's electrical use. You can reduce your energy bill significantly by switching to energy-efficient lighting. The LEDs provided in this kit use roughly 10 percent of the energy of an incandescent bulb and last 25 times longer. While LEDs are slightly more expensive than incandescent, they more than pay for themselves over time because of the savings on your energy bill.



## STEP #3: SWITCH LIGHTBULBS TO LEDs

LEDs screw into place the same as incandescent bulbs. Follow these steps as you set out to switch over to LEDs:

1. When shopping for LEDs, choose an LED with the same amount of lumens as the old bulb. You should be able to find how many lumens on the packaging.
2. Read the packaging to see where the bulb should be used; not all Energy Star qualified LEDs are designed to work in every socket.
3. First replace the incandescent bulbs in fixtures that have the highest use; this will result in the greatest savings for you.



LED Light Bulb

### TIPS:

- If you want a dimmable light, look for the "Dimmable" label on your LED.
- Pay attention to the color you are getting. LEDs are available in a variety of colors from warmer to cooler as indicated on the package. The higher the temperature listed on the bulb, the cooler the light.
- Make sure to dust your bulbs at least every six months; a dirty bulb is an inefficient bulb.

1,000 Kelvins

10,000 Kelvins

### Next Steps

- As your less efficient lightbulbs burn out, replace them with LEDs. You can find LEDs in many sizes and shapes at any major hardware store.
- Replace your outside lights as well. LED flood lights are available.

## HOW TO HANDLE A BROKEN BULB



### Incandescent

1. Turn off and unplug the fixture.
2. Put on protective work gloves.
3. Grip metal lip of the bulb with pliers or wrench.
4. Turning counterclockwise, gently unscrew the bulb base.
5. Place bulb and broken glass in a paper bag and place in the trash.

### LEDs

LEDs can go in your garbage. They are not currently recycled in Sonoma County.

### Fun Fact:

Broken incandescent bulbs can be removed from the socket using a potato. Simply cut the potato in half, push the flesh into the broken section of the bulb, and twist counterclockwise.



VIDEO: Removing Broken Incandescent Bulbs  
<http://goo.gl/eOPnh>



### CFL

1. Turn off and unplug the fixture.
2. Open a window or door to the outside environment and leave the room, letting it air out for 10 minutes to let the hazardous chemicals from the bulb dissipate.
3. While continuing to air out room, carefully scoop up glass pieces and powder using stiff paper or cardboard; place into a thick plastic bag.
4. Use sticky tape to pick up remaining fragments (**DO NOT VACUUM**).
5. Wipe area clean with a damp paper towel; dispose of towel in the trash.
6. Place each CFL in a separate, clear, and sealed plastic bag; bring to a hardware or lighting store that recycles CFLs (typically this service is provided free of charge).
7. For CFL recycling locations, visit [earth911.com](http://earth911.com).



TIPS: Cleaning Up Broken CFLs and Disposing of Spent CFLs  
<http://goo.gl/tnFx9>

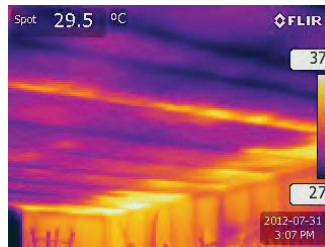
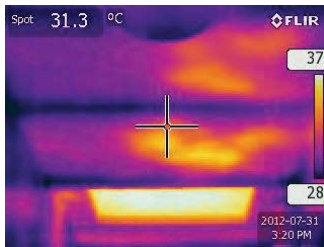
# REDUCING ENERGY USE: HOME ENVELOPE

Sealing cracks, gaps, and leaks and improving the insulation in your home can save up to 20 percent of your heating and cooling costs. The Infrared Laser Thermometer will help you detect where you may be losing or gaining heat through windows, lighting fixtures, outlets, vents, door jambs, and heating and cooling systems.



## STEP #4: USE THE INFRARED LASER THERMOMETER

The Infrared Laser Thermometer detects heat gain and loss. Turn on and point the thermometer at potential trouble spots in your home. Note any temperature fluctuations that may be caused by air leaks.



These images (taken from an infrared camera) show examples of a home with a poor thermal envelope. The spots in yellow are places where little or no insulation are present. On a warm day, heat is being conducted through the ceiling and walls, making these areas hot.

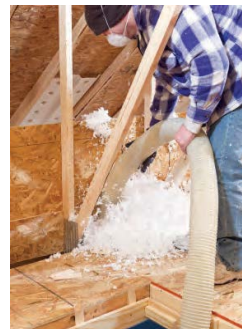
**Instructional Video:** How to Use an Infrared Laser Thermometer. Scan the QR code with a smart phone to view the video or visit: <http://goo.gl/bDJj2>



## TIPS:

Heating and cooling can account for up to 50 percent of home energy use; a properly insulated home will reduce this cost and keep your home more comfortable — cooler in the summer and warmer in the winter. Take these steps to reduce leakage in your home envelope:

- Caulk windows (video below).
- Schedule a professional audit or contact a local contractor to address insulation needs around your light fixtures, vents, or other spots. Energy Upgrade California is an excellent resource for this; visit [www.energyupgradeca.org/home\\_upgrade](http://www.energyupgradeca.org/home_upgrade) for information.
- Insulate ceilings, walls, attics, floors, crawl spaces, and basements to recommended standards for optimum savings.
- Common types of insulation are fiberglass, cellulose, rigid foam board, and spray foam.



**Instructional Video:** How to Caulk Windows. Scan the QR code with a smart phone to view the video or visit: <http://goo.gl/pdRsj>



## DO-IT-YOURSELF

### Home Energy and Water Savings Toolkit

You pay for heating your home, so don't just let that heat leak out through gaps in your doors, windows, and outlets. Follow these steps to stop those leaks!



#### STEP #5: INSTALL WEATHERSTRIPPING

Use weatherstripping to seal gaps in your doors and window jambs.

1. Check for drafts around external doors and window jambs. Use the Infrared Laser Thermometer, or if you can see light or slide a piece of paper through an area, then it needs weatherstripping. The entire door or window usually doesn't need weatherstripping focus on the sections where you feel air or can see light.
2. Clean the application area to ensure a good seal.
3. Cut a length of weatherstripping to match the length of door or window where the strip will be applied. Peel back adhesive strip and apply.
4. Please return whatever you do not use in the toolkit.



Weatherstripping

**Instructional Video:**  
How to Apply  
Weatherstripping.  
Scan the QR code with a  
smart phone to view the  
video or visit:  
<https://goo.gl/FgQw3g>

#### TIP:

A door without weatherstripping may not look like a problem, but the amount of exposed area from different locations can add up to a big hole! Consider installing a door sweep to help keep out drafts; you can pick one up at your local hardware store.



#### STEP #6: INSTALL OUTLET GASKETS

Outlet gaskets help prevent air leaks that can result from poor wall insulation.

1. Identify exterior walls with the most exposure to draft.
2. Choose an outlet or switch plate to upgrade, preferably on an external wall.
3. Carefully loosen the face plate screw with a screw driver (not provided) and remove faceplate.
4. Place gasket over internal area. If necessary, trim the gasket to fit around the outlet.
5. Replace faceplate cover and tighten screw.
6. Repeat for other outlets or switches throughout your house.

**Instructional Video:** How to Install Outlet Gaskets. Scan the QR code with a smart phone to view the video or visit: <http://goo.gl/HQ4YW>



Outlet Gaskets

# INTRODUCTION TO WATER USE

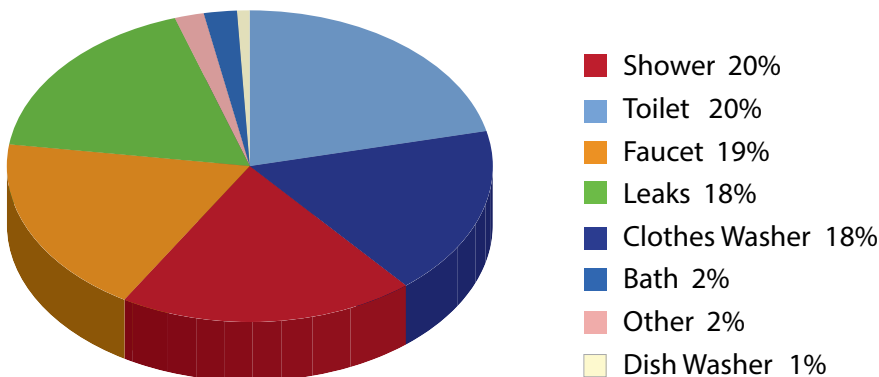
As a necessity for life itself, water is one of our most precious natural resources. In Sonoma County, we get most of our primary water supplies from the Russian River watershed, which includes the Russian River, Lake Sonoma, and Lake Mendocino. But with a changing climate and growing populations, our water resources have been shrinking year by year. While state and local leaders continue to work on long-term solutions to our water challenges, saving water on a daily basis helps stretch supplies and can save you money.



## When you save water, you also save energy.

That's because a good chunk of California's electricity (20 percent) and natural gas (30 percent) consumption is used simply to pump, transport, and treat water around the state. Up to 49 percent of a typical home's gas usage goes to heating water. Therefore, reducing water use can help lower your energy bills.

Indoor Water Use in a Typical Single Family Home



**Fun Fact:** On average, U.S. residents use 69 gallons of water a day per person for indoor use. That's 25,000 gallons a year per person — enough to fill an average home swimming pool!



# REDUCING WATER USE AT THE TAP



## STEP #7: MEASURE THE FLOW RATE OF FIXTURES

Using the water flow rate bag, you will measure the rate that water flows from your faucets and showerheads.

1. Determine if your existing fixture is already low-flow; this should be printed on the side of the device. Low-flow fixtures are marked as follows:

Bathroom sink: 0.5 gpm

Kitchen sink: 1.5 gpm

Showerhead: 2.0 gpm



Water Flow  
Rate Bag

If the existing fixture is not marked as above, continue with the following steps.

2. Turn on faucet to the extent you normally do and fill water flow rate bag for 5 seconds.
3. If the flow rate is greater than noted in the 1st step, then install one of the Toolkit fixtures (see below).
4. Test the flow rate again after the installation and note your findings.
5. Dry the bag with a towel before putting it back in the Toolkit.

\*Think before you dump leftover water; make the most of it by giving it to your indoor or outdoor plants.



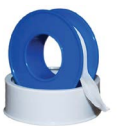
## STEP #8: REPLACE THE AERATORS — VIDEO ON NEXT PAGE

Check the imprint on the aerator for flow rate, or use the flow rate bag to measure. If the faucet flows at more than 0.5 gpm (bathroom) and 1.5 (kitchen), then you should replace the current aerators with the aerators provided. Note: Some kitchen faucets are custom sizes and cannot be replaced with the toolkit's aerator. You can still measure the flow rate and seek alternatives at a local hardware store or online.



Faucet  
Aerator

1. Close or plug your drain.
2. Unscrew old aerator counterclockwise; if needed, use the pliers supplied in the Toolkit to loosen the aerator. Wrap the teeth of the pliers with a rubber band or a towel to avoid scratches to the existing equipment.
3. Clean and dry water pipe threads (grooves at end of faucet).
4. Wrap provided pipe thread seal tape around pipe thread.
5. Screw on new aerator clockwise by hand.
6. Turn on faucet to test for leaks, and tighten with pliers if necessary.



Pipe Thread  
Seal Tape



Pliers

# REDUCING WATER USE: BATHROOM



Low-Flow Showerhead



## STEP #9: REPLACE THE SHOWERHEAD

Check the imprint on the showerhead for flow rate, or use the flow rate bag to measure. If the showerhead flows at more than 1.5 gpm, then you should replace with the showerhead provided.

### Instructions: Identical to Step #8

**Instructional Video:** Use your smart phone to follow these QR codes for videos on how to change your faucet aerator and showerhead.

Faucet Aerator



<http://goo.gl/ZHDeo>

Showerhead



<http://goo.gl/qkcxB>



## STEP #10: USE THE TOILET LEAK DETECTION TABLETS

Leaking toilets can contribute to high water bills if undetected. The Detect-A-Leak Toilet

Tablets are a simple and inexpensive way to test for leaks on a regular basis.

1. Carefully remove tank lid.
2. Drop 1-2 tablets into exposed tank.
3. Wait 20-30 minutes. Do not flush the toilet during this time.
4. If blue color appears in the toilet bowl you have a toilet flapper leak. Typically, a leaky flapper is the cause for toilet leaks and needs to be replaced.



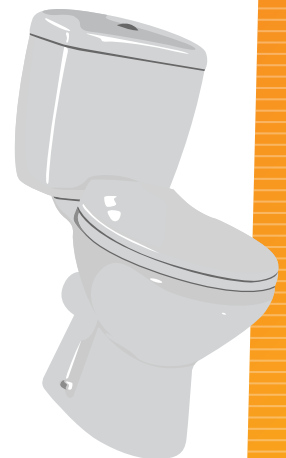
Toilet Leak Detecting Tablets



This is relatively simple and inexpensive and may not require a plumber.

### WATER SAVINGS TIPS

- Avoid running water while brushing your teeth and shaving.
- A constantly running toilet can waste up to 200 gallons of water per day. That can cost you \$250 over the course of a year! Contact your city's public works department to find out what free water audit services might be available to you.
- Upgrade your old, inefficient toilet (3.5 gallons per flush or more) to a high-efficiency or dual flush toilet.
- Make use of a shower timer, which helps you use less water and save energy at the same time. Try to set it for five minutes or less.



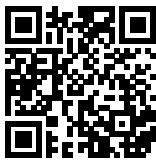
# REDUCING WATER USE: WATER HEATER

Heating water typically accounts for up to 49 percent of the natural gas use in your home.



## STEP #11: ADJUST THE WATER HEATER

1. Locate your water heater.
2. Locate adjustment dial and mark current setting with a pencil or masking tape.
3. Locate the faucet closest to the water heater.
4. Run water until hot and capture a cupful in a mug. You can catch cold water in a bucket for outdoor use while waiting for the water to get hot.
5. Insert thermometer and wait for it to reach its highest point.
6. Adjust setting so that your hot water runs at 120°F. If your water heater does not have specific temperature settings, this step might take a few tries.



**Instructional Video: How to Adjust Your Water Heater Temperature.** Scan the QR code with a smart phone to view the video, or visit this link:  
<https://www.youtube.com/watch?v=klaeTqH3eWE>

### TIPS:

- Insulate the hot water pipes leading from the water heater. This helps conserve energy.
- Set your water heater to “Vacation Mode” when you are away for long periods of time to conserve energy.
- Check the EnergyGuide sticker when purchasing a new hot water heater. It provides the estimated cost to run the equipment.

Low Flow Indicator



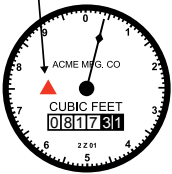
Odometer

## How to read your water meter

Water meters in the U.S. typically measure volume in gallons or cubic feet. One cubic foot = 7.48 gallons and 100 cubic feet = 748 gallons. Water charges are typically based on 100 cubic feet or on 1000 gallon units. Finding your water meter can be a challenge. Look for it near the sidewalk or even in the sidewalk. The cover is often labeled “Water.”

# LOOKING FOR LEAKS

Straight-Read  
w/leak detector



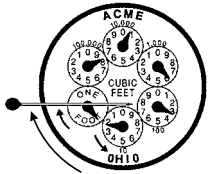
You may routinely put new washers in the faucets and fix any leaks you can see, inside the house and around the yard but do you have any invisible leaks? It's time to check inside your meter box. It's usually in front of the house near the curb. Lift the cover aside to expose your water meter. Flip open its hinged lid. You'll find either a straight-reading or round-reading dial.

Straight-Read  
Tooth Pick



On straight-reading meters, the large needle on the dial is used for testing. On round-reading dials, the test dial will either be labeled "one foot" or will have no markings.

Round Dial



With all of the faucets (inside and outside) shut tightly, mark the test-needle by laying a straight-pin or toothpick exactly on top of it.

- A half hour later, check the dial again. If the test needle has moved – and no one has used any water – you probably have a leak and should do some more investigating.

Straight Pin

- To determine if the leak is inside or outside the house, locate the main shut-off valve (usually at the front of the house underneath an outside faucet). If the dial moves while the main house valve is turned off, you may have an underground house line leak. Inspect along a straight line between the meter and the house valve for surface water or a wet or super-green spot.

## Leaks can hide outside

### Look for Bright Green or "Soft" Areas

Whatever irrigation equipment you have – manual, sprinkler or drip – be aware that not all leaks are obvious. First check for overly green or soggy spots, where broken spray heads or bubblers or underground pipe cracks will tell on themselves. Buried pipes, hoses or drip lines leaking into sandy, porous soil may not show up clearly. Automatic sprinkler and drip systems that generate a hissing sound are likely leaking. Also, remember to check drip systems for damage from foot traffic or gnawing pets or pests. Got leaky hoses? Repair them with waterproof tape. Dribbling spray nozzle connection? Wrap the hose threads with Teflon tape.

**Read Your Meter – Often!** One way to find out the 'why' of high water consumption is to determine the 'what' and 'when' consumption is occurring. Read your meter every day or every week and keep a log of the readings. Is your consumption consistent or is it higher on some days? If your sprinkler system has a timer, read the meter the day before and the day after an irrigation cycle. How much water is going into the garden? How does that compare to the days without irrigation?

## Intermittence

Leaks that may occur intermittently (like a running toilet, irrigation system leak or faulty swimming pool fill valve) will not always continuously register at the meter. These are all early steps you can take to locate the problem yourself before calling a plumber or leak detection specialist.

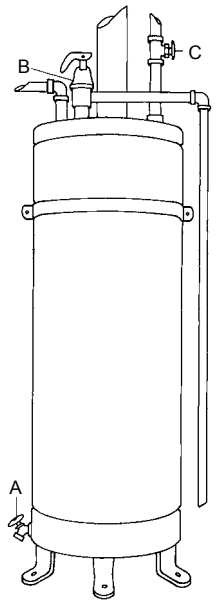
## Water heater leaks

### Little Leaks Can Mean Big Problems

Most people visit their water heaters only if the hot water stops. Check yours. If you notice a puddle of water around the bottom of the tank, it probably indicates a leak caused by corrosion – a sure sign of old age, and the most common reason for replacing the tank. If the tank wall is corroding, more problems are coming, and it's time to retire the tank and get a new energy saving model.

Water heaters last about 15 years with proper care. To clear out any sediment, flush a few quarts of water from the drain valve at the bottom of the tank into a bucket about every six months – maybe when you change fire alarm batteries around the house. Also operate the pressure-relief valve at the top of the tank. Don't worry if a little water leaks out; that means it's working. Also close and reopen the cold-water inlet valve at the top, so you're sure it's easy to operate in an emergency.

A: Drain Valve; B: Pressure relief valve;  
C: Cold-Water inlet valve



## Shower diverter leaks

### An Overlooked Water and Energy Waster

If you have water coming out of a tub spout when the shower is running, your diverter is no longer working properly and you have a leak. This wastes both water and the energy used to heat water.

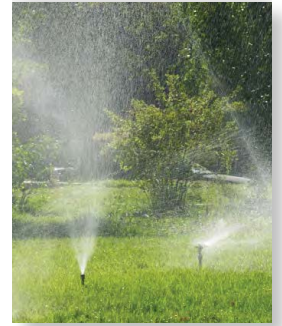
Studies have shown that 34% of the diverters leak more than 0.1 gallons per minute (gpm). Some diverter leaks can be as high as 3.0 gpm. The average diverter leak, 0.8gpm can waste 7,200 gallons annually per family of three (8 minute showers). If you add the cost to heat the water, diverter leaks can cost up to \$100 per year. Check with your local hardware store or your plumber for a replacement. This may require a plumber or handy person.



# REDUCING WATER USE: OUTDOOR

## WATER SAVINGS TIPS

- Regularly check for and fix leaks in your irrigation system; leaks can waste thousands of gallons of water annually. Run each station of your automatic irrigation controller and do a visual inspection. Water shouldn't be running into the gutter and should only be spraying the landscaping.
- Consider switching to a drip irrigation system to save water.
- Water between sunset and sunrise when temperatures and wind are the lowest; this reduces evapotranspiration and allows water to soak deeper into your landscaping.
- Pool filters are energy intensive. Consider reducing your filter times in the fall and winter and set timers to avoid peak utility rates. Using a pool cover will save even more energy and water.
- To view water-saving tips and rebates, visit [www.savingwaterpartnership.org](http://www.savingwaterpartnership.org).
- Change your irrigation schedule with the season and with local weather conditions. Better yet, consider upgrading to a weather based irrigation controller.
- Make sure sprinklers are pointed at landscape and are not watering concrete.
- Consider a switch to drought tolerant landscaping.



## Car Washing

A home car wash uses 80-140 gallons of water whereas most commercial car washes use 30-45 gallons. Washing your car on your driveway or in the street sends dirty water, soap, heavy metals, oil, and grease into the gutter, which flows to local creeks and waterways. If you wash your car at home, park it over the lawn or a gravel area.

## Rebates!

Rebates may be available for water-efficient fixtures through your local water provider. Visit [www.savingwaterpartnership.org](http://www.savingwaterpartnership.org) or call (707) 524-1165 for more information.



# COOKING AND EATING

Kitchen activities often require large amounts of energy. Use these tips to reduce energy use:

## Efficient Cooking Habits

- Thaw frozen meats and seafood in the fridge to reduce cook times.
- Double your recipe, freezing half for later.
- Heat only as much water as needed.
- Cover pans to reduce cook time and energy.
- Use fewer pots to reduce dish washing needs.
- Use your toaster oven or microwave for small items; unplug appliances when not in use.
- Avoid opening the oven door.



## Efficient Dishwasher Habits

- Dishwashers use less water than washing by hand
- Scrape, don't rinse, dishes.
- Use the short cycle.
- Air dry dishes by turning off the heat setting and opening the door.
- Upgrade to an EnergyStar® model, saving up to \$10 per year. Visit <http://goo.gl/slvjF> for more information.
- Use during non-peak utility rate times.



## Eating Habits That Help the Planet and Your Health

- Rethink your drink. Avoid sweetened beverages—one 20-ounce soda contains 17 teaspoons of sugar.
- Look in your refrigerator first. In the U.S., 40 percent of our food goes uneaten. Eat what you have before shopping for more. Take the EPA's Food Recovery Challenge. Visit <http://goo.gl/AZAU4G> for more information.
- Eat locally. Reduce the miles your food travels and support local farmers.
- Opt for organic. Avoiding pesticides is better for the environment and your health.
- Try the veggie option. Meat production uses an enormous amount of water and energy. On average, it takes 28 calories of fossil fuel energy to produce one calorie of meat, versus 3.3 calories of fossil fuel energy to produce one calorie of protein from grain. Similarly, it takes 4,200 gallons of water daily to support a meat-based diet, versus 300 gallons to support a vegan diet. Going meatless once a week will make a difference.
- Prepare balanced meals. Provide meals loaded with fruits and veggies to promote healthy eating habits for you and your kids.



# TRANSPORTATION

## Get Better Gas Mileage

- Regularly maintain your vehicle — a happy car is a more efficient car.
- Under-inflated tires will decrease your miles per gallon, so check the tire pressure when filling your tank. Proper tire pressure levels can be found on the inside of the driver's side door.

## Or, Ditch the Car!

- Consider using alternative transportation at least a couple times a week.

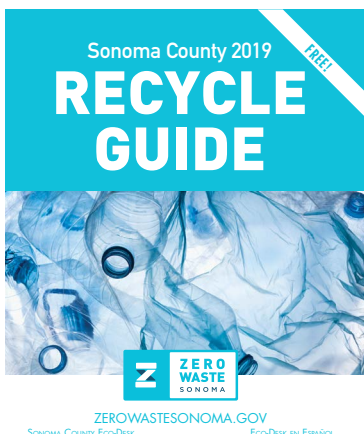
- Walk or bike whenever possible.
- Try public transportation. Visit [www.sctransit.com](http://www.sctransit.com) for local routes and schedules.
- Safe Routes to School — teach your kids to cut fossil fuel use on the commute to school by walking, biking, scootering, or taking the school bus. Visit [www.sonomasaferroutes.org](http://www.sonomasaferroutes.org) to learn the ways to create a fun, healthy, and safer way to get to school.

## Switch to an Electric Vehicle

- Reduce your greenhouse gas emissions.
- Save money on fuel costs and maintenance
- Enjoy a quieter and cleaner ride

## Compost and recycle

Composting not only provides healthier soil and plants but can save you money by not having to buy soil conditioners, mulch, and fertilizer. Home composting also reduces yard trimming collection and processing; keeps kitchen waste out of the landfill; and turns organic material into a valuable product for gardens and house plants.



For information about recycling programs for each city in Sonoma County, visit <https://zerowastesonoma.gov/>. This site includes a recycling guide and information about disposing of toxics, reducing junk mail, drop-off recycling locations (buy-back), the carryout bag ordinance, and much more.



# FINAL STEPS

## Return the DIY Toolkit to the Library

Now that you've used the Toolkit and accomplished the steps to a more energy-efficient home, you have just a few things left to do:

1. Make sure all tools (see list on page 2) are in your kit before returning it to the library. Please return the Toolkit as soon as you can so other library patrons can make use of it.
2. Want more energy saving tips? Contact the Sonoma County Energy and Sustainability team at [www.sonomacounty.ca.gov/energy](http://www.sonomacounty.ca.gov/energy) or call (707) 565-6470.
3. Want more water saving tips? Contact the Sonoma – Marin Partnership at [www.savingwaterpartnership.org](http://www.savingwaterpartnership.org) or call (707) 524-1165.
4. Want more information on switching to an EV? Visit [DriveEV.org](http://DriveEV.org).
5. Consider amplifying your savings through the whole home performance approach of Energy Upgrade California—visit [energyupgradeca.org](http://energyupgradeca.org) to learn more and get started.
6. Thinking about going solar? Energy efficiency steps should be done first, enabling you to drive down your total energy demand so that you don't buy a bigger solar system than you need. Visit [gosolarcalifornia.org](http://gosolarcalifornia.org) to learn more about solar options for your home or contact the Sonoma County Energy and Sustainability Office for a free and unbiased solar consultation at (707) 565-6470.
7. Spread the word about this DIY Toolkit.
8. Enjoy the savings from all of your DIY actions!



