

# WORK BOOK

# Dear student,

The following workbook is to be used with the ten-session curriculum. Each activity corresponds to a session in the curriculum.

All the activities are from *Low Carbon Diet* by David Gershon (Empowerment Institute, 2006), with the exclusion of “Personal Energy Survey” and “Monitoring Your Electric Meter.” Those two are from the *Kilowatt Ours* curriculum compiled by Jennifer Barrie.

Sincerely,  
Egan Marie Connor Short  
You Advisory Council  
Georgia Interfaith Power and Light





# Personal Energy Survey

Circle the most accurate response for each of the questions below.

**> People in my home wait until they have a full load of clothes before doing laundry.**

- [1] Never
- [2] Sometimes
- [3] Often

**> I close the refrigerator door quickly after I decide what I want to eat.**

- [1] Never
- [2] Sometimes
- [3] Often

**> The thermostat in my house during winter is set near**

- [1] 80° Fahrenheit
- [2] 70° Fahrenheit
- [3] 65° Fahrenheit

**> When I leave a room, I turn the lights off.**

- [1] Never
- [2] Sometimes
- [3] Often

**> My family uses low-wattage light bulbs or compact fluorescent lights when possible instead of incandescent light bulbs.**

- [1] Never
- [2] Sometimes
- [3] Often

**> During the summer, the thermostat in my house is set near**

- [1] 65° Fahrenheit
- [2] 72° Fahrenheit
- [3] 78° Fahrenheit

**> I close the windows and doors when the heat or air conditioning is on.**

- [1] Never
- [2] Sometimes
- [3] Often

**> When no one is home for four hours or more, I adjust the thermostat.**

- [1] Never
- [2] Sometimes
- [3] Often

**> I turn off or unplug the TV, CD player, computers and other appliances when no one is around or not using them.**

- [1] Never
- [2] Sometimes
- [3] Often

**> When possible, people in my home dry their clothes outside on a clothesline instead of in the clothes dryer.**

- [1] Never
- [2] Sometimes
- [3] Often

**> I use fans to help cool my home during the summer.**

- [1] Never
- [2] Sometimes
- [3] Often

**> People in my home wait until they have a full load of dishes before using the dishwasher.**

- [1] Never
- [2] Sometimes
- [3] Often

> **We recycle in our household (metal, plastic, glass, cardboard and paper).**

- [1] Never
- [2] Sometimes
- [3] Often

> **When it is cold in the house, I put on a sweater or hat to help stay warm.**

- [1] Never
- [2] Sometimes
- [3] Often

> **In our home we wash our clothes in cold water instead of warm or hot water.**

- [1] Never
- [2] Sometimes
- [3] Often

> **I take showers for about**

- [1] 20+ minutes
- [2] 10 minutes
- [3] 5 minutes

> **We set our water heater between 120° and 130° Fahrenheit.**

- [1] Never
- [2] Sometimes
- [3] Often

> **When my family leaves the house for more than one day, we adjust the temperature on the hot water heater, thermostat, and refrigerator.**

- [1] Never
- [2] Sometimes
- [3] Often

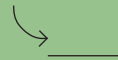
> **I know how to read the electric and gas meters at my home.**

- [1] No
- [2] I think so
- [3] Yes

> **I look at my electric and gas bills each month to keep track of my household's energy use.**

- [1] Never
- [2] Sometimes
- [3] Often

ADD UP THE TOTAL  
SCORE OF YOUR  
RESPONSES HERE.



**27 OR LESS** You have lots of room for improvement! You can start to make changes to save energy and money. There are many simple actions you can take, beginning with the ideas in this survey and at [kilowattours.org](http://kilowattours.org).

**28 TO 51** You have made a great attempt to save energy, but you can still improve your habits to save even more.

**52 TO 60** Congratulations! You have done an excellent job with energy conservation! Keep it up!

# Monitoring Your Electric Meter

An electric meter consists of five round dials which are numbered zero to nine. Read the dials from left to right. If the dial points directly to a number, record that number. If it lies between two numbers, always record the smaller number. If the pointer is between nine and zero, record nine, because zero represents ten. If the pointer is between zero and one, record zero, because zero represents zero.

Read your meter at the same time every day for seven days to find out how much electricity your household uses. Record the numbers in the following log.

DATE	TIME	kWh READING	kWh USED

- > To calculate how much energy your family is using each day, use the following equation: **day 2 reading – day 1 reading = total kWh used for day 1**
- > To calculate how much energy your family is using each week, use the following equation: **day 7 reading – day 1 reading = total kWh used for week**
- > Multiply this by four to get how much energy you use each month. Convert that to coal burned. **kWh used each month = pounds of coal used each month**
- > Multiply that number by 1.4 to get how many pounds of CO<sub>2</sub> you emit each month. **pounds of coal per month • 1.4 = pounds of CO<sub>2</sub> emitted per month**
- > To calculate your annual carbon footprint, multiply that by twelve. **pounds of coal per month • 12 = pounds of CO<sub>2</sub> emitted per year**
- > To calculate your monthly sulfur dioxide footprint, multiply how many pounds of coal you use per month by .0006. For your nitrogen dioxide footprint, multiply the pounds of coal by .003.

**WRITE THAT NUMBER VERY LARGE ON THIS PAGE**





# Q&A

## compact fluorescent bulbs

### What is a compact fluorescent light bulb (CFL)?

A compact fluorescent light bulb (CFL) is fluorescent lighting designed to be used in a standard (incandescent) light bulb socket. Fluorescent lighting works by passing a current through a gas-filled tube. Incandescent light works by heating up a metal filament until it is white-hot. Incandescent bulbs produce mostly heat, which is why a fluorescent using only 13 watts of electricity can produce light comparable to an incandescent hogging 60 watts.

### How does a CFL benefit the environment?

Each 13-watt CFL, over the expected 10,000 hour life of the bulbs, will save 470 kilowatt-hours (kWh) of electricity as compared to a 60-watt incandescent bulb. This translates to a global warming-fighting reduction of over 730 pounds of carbon dioxide. It also means a reduction of 1.6 pounds of nitrogen oxides (which contribute to ozone and acid rain) and 4.3 pounds of sulfur dioxide (which contributes to haze and acid rain), and makes significant reductions in other impacts of coal-produced power such as mercury pollution and destruction of forest and stream habitats in mining areas.

### Where can I use CFLs?

A standard 13 watt CFL is only ½ inch longer than a standard bulb. Though thicker near the base, it is smaller in maximum diameter. Therefore, it will physically fit almost anywhere an old bulb would. However, it cannot be used in a fixture that is recessed and enclosed, on a dimmer, or anywhere it would be exposed to moisture, without greatly shortening its lifespan. Desk, table, and floor lamps are ideal locations as are many indoor ceiling fixtures. There are now CFLs made especially for dimmers, three-way applications, outdoor fixtures, recessed fixtures, and other specialty applications. Visit [www.shopipl.org](http://www.shopipl.org) to find out more.

### Don't CFLs cost more?

Although a single CFL costs more initially, over the life of the bulb you actually save money. See the chart on the next page for a comparison of costs between a 60 watt incandescent and a 13 watt CFL based on 10,000 hours of light (nearly 7 years if the light is on 4 hours per day).

	CFL	INCANDESCENT
ENERGY OUTPUT [watts]	13	60
LIGHT OUTPUT [lumens]	810	830
USEFUL LIFE [hours]	10,000	1,500
NO. OF BULBS FOR 10,000 HOURS	1	6.7
BULB COSTS [for 10,000 hours]	\$3.50	\$2.14
ELECTRICITY USED [killo watt hours]	130	600
ELECTRICITY COST [8¢ per kWh]	\$10.40	\$48.00
TOTAL COST [electricity + bulb]	\$13.90	\$50.14

> Cost saving in a CFL over its lifetime = \$36.24 or 72%

### What criticisms have been leveled against CFLs?

#### **No use in recessed and enclosed, dimming, or outdoor fixtures**

> There are now CFLs suitable for use in a wide variety of applications.

You can find many of them at [www.shopipl.org](http://www.shopipl.org).

#### **“Cooler” light spectrum of older fluorescents**

> Most modern CFLs produce “warm white” light comparable with that of an incandescent.

#### **Do not live up to claims of longevity**

> The blue EnergyStar logo identifies bulbs tested for efficiency and longevity. All bulbs used by GIPL are EnergyStar rated.

#### **Lag time after the light switch has been turned on**

> Modern CFLs delay less than a second.

#### **“Flicker” in traditional fluorescent bulbs**

> GIPL’s CFLs are described as “flicker-free.”

#### **Mercury present in all fluorescent bulbs**

> The mercury in each CFL is less than one percent of that in a mercury thermometer. It is also less than the amount of mercury the CFL spares the environment because of coal not burned. All products containing mercury should be disposed of by appropriate methods. So, after the long, long useful life span of a CFL is over, we recommend recycling your bulbs. You can find a recycler in your area by visiting [www.earth911.org](http://www.earth911.org). You can even get boxes to send in bulbs for recycling at [www.shopipl.org](http://www.shopipl.org).

# Dumping on Garbage

The average US household produces about 4.5 pounds of solid waste per day. About a third of it is packaging used only to get the item to your home. Producing this waste requires energy for extraction of the raw materials, manufacturing them into various goods, and transportation throughout the whole process. Every pound of solid waste that goes to the landfill generates 1.5 pounds of greenhouse gases. These come from- transporting and land-filling the waste and from the natural decomposition that occurs in an anaerobic environment.

> On this week's garbage collection day, record how much garbage you put on the curb in the first of the charts below. Try to reduce your waste by one garbage can size in time or the next garbage collection day. Record how much garbage you throw away the second week.

WEEK ONE	SIZE OF BAG OR CAN	NUMBER
TOTAL GALLONS		

WEEK TWO	SIZE OF BAG OR CAN	NUMBER
TOTAL GALLONS		

> Credit yourself according to the table below depending on how much you reduced your garbage from week one to week two.

WEEK ONE AMOUNT	WEEK TWO AMOUNT	CO <sub>2</sub> REDUCTION
90 GALLONS	60 GALLONS	3,000 POUNDS
60 GALLONS	35 GALLONS	2,650 POUNDS
35 GALLONS	20 GALLONS	1,350 POUNDS

Circle your CO<sub>2</sub> reduction.

Note: If you reduce your waste by more than one level, add the reductions together.

> Add this reduction to the log in the front.

# Better a Sweater

During cold weather, many people set their home thermostat a little warmer than necessary. Home heating accounts for over a quarter of your energy bill. You can turn down your thermostat and still be quite comfortable.

- > During the day when people are home, set your thermostat at “sweater” temperature: between 65° and 68° degrees.
- > Before going to bed at night or when everyone is out of the house, set the thermostat to “blanket” temperature: between 55° and 58°.
- > Consider installing a programmable thermostat so you make sure the heat is always at the temperature you wish. This can reduce your heating bill by up to 20 percent.

If you changed your thermostat habits by setting your thermostat to 65 to 68° when someone is active in the house and 55° to 58° at night, add 1,400 pounds to the log in the front.

## WHEN IT'S WARM OUTSIDE

- > Set your thermostat at “short sleeve” temperature: 78°. If the temperature outside is the same or cooler than that, just open the windows. For every degree you raise the thermostat, you save three to five percent of your cooling costs.
- > Install a programmable thermostat or timer on your air conditioner so you don't have to leave it on when it's not needed. It pays to turn off your air conditioner when you will be gone for more than an hour.
- > Keep your shades or curtains drawn during the heat of the day and plant trees on the western, southern, and eastern sides of your house. A home's indoor temperature can rise as much as 20° if the windows are not shaded.

If you raise your thermostat by four degrees or up to the next highest setting, you will reduce your CO<sub>2</sub> settings by 20 pounds per month. Multiply this by the number of months that you use your air conditioning during the year and add these savings to the log in the front.

# Water, Water, Everywhere

**> STEP ONE** Many people spend ten minutes or more in the shower. Heating hot water for a ten-minute shower can generate as much as four pounds of CO<sub>2</sub>. A bath can use up to twice the amount of hot water you need for a five-minute shower. Use an efficient shower to get clean, and a bath or occasional long shower for relaxation.

- > Reduce your showering time to five minutes.
- > If you can, install low-flow shower heads.

For each person in your household who reduces their shower time to five minutes, add 175 pounds of CO<sub>2</sub> to the log. For each low-flow shower head you install, credit yourself with 250 pounds in savings.

**> STEP TWO** Each time you run the dishwasher, you produce approximately two pounds of CO<sub>2</sub>. Hand washing dishes inefficiently can use up to 15 gallons of hot water or almost 3 pounds of CO<sub>2</sub> per dish-washing. Through greater dishwashing efficiency, you can reduce your CO<sub>2</sub> footprint in this area by 25 percent or more.

- > Run your dishwasher only when you have a full load. Scrape off food, but don't rinse dishes before loading. Air dry dishes rather than using heat dry.
- > Hand wash dishes in a tub of hot soapy water. Fill a second tub for rinsing dishes.

If you reduce your dishwasher use by one load per week, credit yourself with 175 pounds of saved CO<sub>2</sub>. For minimizing hot water use in hand dish washing, credit yourself with 125 pounds of saved CO<sub>2</sub>.

CONTINUED NEXT WEEK!

## PART TWO

# Water, Water, Everywhere

**> STEP THREE** Typical electric clothes washers and dryers generate five pounds of CO<sub>2</sub> per washer/dryer cycle.

- > Wear clothes until they are actually dirty. Hang them up after each wearing to let them air out naturally.
- > Use an iron to touch up creases or a wet cloth and a little soap to get a spot out when the rest of the garment is clean.
- > When you wash your clothes, be energy-efficient by doing full loads and using cold water for washing and rinsing.
- > Dry full loads or use a clothesline instead.
- > Separate loads for fast- and slow-drying clothes and use moisture or automatic settings rather than the timer.

If you switch one load of laundry each week from hot to cold water, credit yourself 275 pounds of CO<sub>2</sub>. If you eliminate the need for one dryer load each week, credit yourself with 200 pounds.

**> STEP FOUR** Your water heater represents about 20 percent of the CO<sub>2</sub> emissions of your home.

- > For maximum water heater efficiency, set your water heater thermostat to 120°.
- > Put water setting to “off” or “pilot” when you go on a trip.
- > If your water heater was manufactured before 1989, install an insulating blanket.
- > Insulate the first five feet of hot water pipes with foam sleeves (but make sure the foam does not touch the exhaust on gas water heaters).

If you set your water heater thermostat to 120° (between the “low” and “medium” settings), credit yourself with 150 pounds of CO<sub>2</sub> saved annually.

If you install an insulating blanket, credit yourself with 175 pounds.





At the end of the week, add up the commute and non-commute miles traveled by you and the other members of your household. Project this over a year, including any trips you normally take that didn't fall into this week period.

Create a plan to reduce your household's single occupancy vehicle miles traveled by 20 percent or more over the next year. Following are some examples of how you could achieve your goal.

> **COMMUTE TRIPS** Telecommuting, carpooling, walking, or biking one or more days a week can reduce your VMT by 20 percent or more.

> **NON-COMMUTE TRIPS** Food, shopping, and household errands: Making a list of all items you need, buying in larger quantities, combining with other trips on the way, and asking other household members if they need anything when you go on an errand can reduce VMT in this category by as much as 50 percent a week.

> **NON-COMMUTE TRIPS** Children's school and after-school activities: carpooling with other parents could reduce this category of VMT by 20 percent to 80 percent.

## DRIVE EARTH SMART

### **BEFORE YOU EVEN PULL OUT OF THE DRIVEWAY**

- > If your household has more than one vehicle, drive the more fuel-efficient model when you have a choice.
- > Plan your route, including commutes to work. The best route may not be the shortest, but the one that prevents idling in traffic. In city driving, up to one-third of your fuel can be wasted through idling.
- > Rid your car of unnecessary weight. You lose one percent fuel efficiency for every extra 100 pounds.

### **WHEN DRIVING ON THE HIGHWAY**

- > Maintain a steady speed, using your cruise control device if you have on. For most vehicles, 55 is the most fuel efficient highway speed and will save you up to 20 to 30 percent in fuel costs compared to driving at 75 miles per hour. It's also safer.

### **WHEN DRIVING ON SECONDARY ROADS**

- > Anticipate stops and slowdowns, decelerating steadily to save gas.
- > When appropriate, drive between 45 and 55 miles per hour, the most fuel efficient range.
- > Turn off your engine if you stop for a minute or two, such as at railroad crossings. It's a myth that it's more fuel-efficient to leave your engine running for a few minutes than to turn it off and restart it later.

- > Have your car serviced on a regular basis. A tuned car improves fuel efficiency as much as 30 percent.
- > Inflate your tires to the pressure that is printed on them.

**ADD UP THE SCORE FROM THE LOG IN THE FRONT.  
WRITE THAT HERE. THEN SUBTRACT THAT FROM  
THE FIRST VERY LARGE NUMBER IN THIS BOOK AND  
WRITE THAT.**