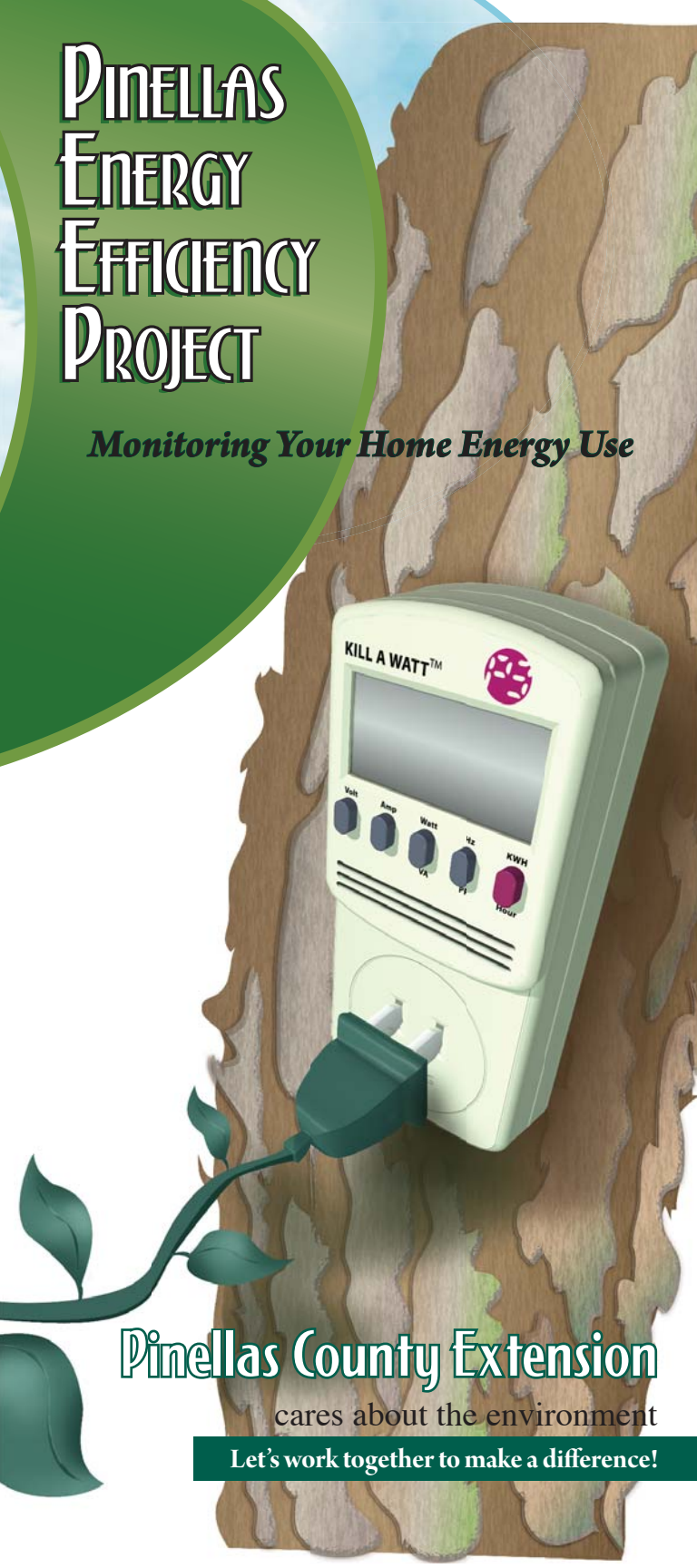
Pinellas Energy Efficiency Project

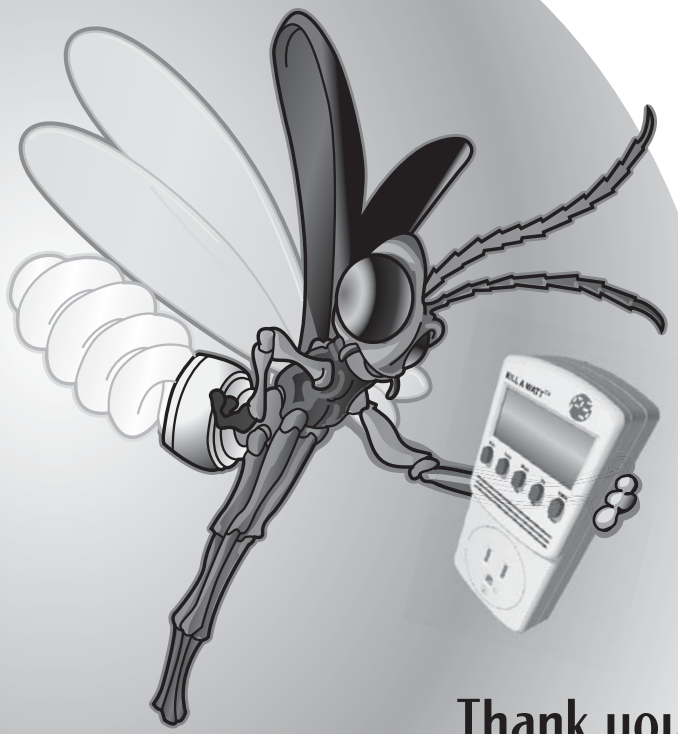
Monitoring Your Home Energy Use



Pinellas County Extension

cares about the environment

Let's work together to make a difference!



Thank you!

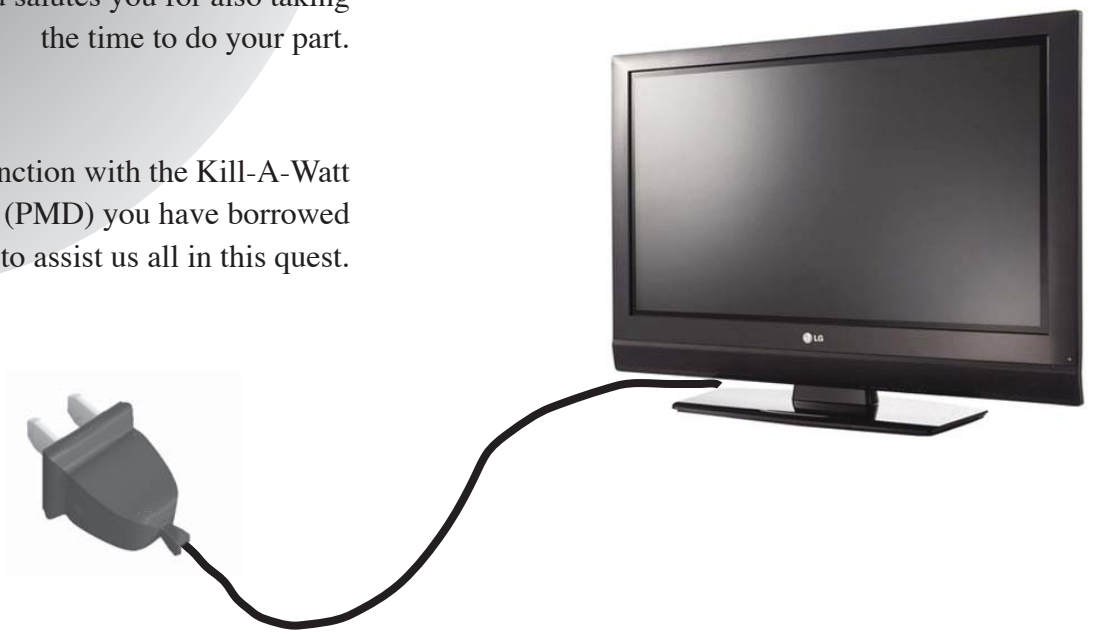
Pinellas County Extension cares about the environment and salutes you for also taking the time to do your part.

This booklet in conjunction with the Kill-A-Watt power monitor device (PMD) you have borrowed is meant to assist us all in this quest.

How much energy does your TV use?

This device is a simple way to see how much energy all your plugged in electronics use. You can track where your energy dollars are being spent by using a simple power or energy monitor. A PMD can indicate the efficiency of an older appliance and can reveal how much energy is being used when some devices are "off!"

Power usage by electronics in the home has increased dramatically in the past decade. Our homes are full of devices that have chargers, power adaptors and stand-by lights even when they are not being used. Stand by lights and power adapters consume electricity round-the-clock., Stand-by electronics also produce heat, putting more stress on your air conditioner.



What does it do?

You can use a power monitor to find a base-line of your electricity consumption for most of your electronics and appliances in the home. **The air conditioner/heater and electric drier CANNOT be tested by a PMD.** Home electric outlets carry 120 Volt loads, and those devices draw more than that, and do not have typical "plugs."

You may be very surprised at just how much electricity your other appliances and devices are consuming. After using the PMD you may be inspired to change your usage of some equipment, unplug devices when not in use, replace inefficient appliances or invest in power strips or "smart strips" to make energy saving more convenient. The worksheet at the end of this fact sheet will help you chart your energy consumption and estimate savings if you make changes to your energy use.

To use a power monitor it is important to understand how it works and how energy is measured. The device has several buttons and a display screen. One button measures the **Voltage** of the outlet. This should be around 120—the standard for homes. **Amp** is the measure of the rate of electricity flow, **HZ/PF** which is hertz cycles/second should be around 60, the standard for US homes. These readings are not as important when measuring a home's energy use.

The readings we are concerned with are the **Watts** and the **Kilowatt hours**. This is the measure of actual electricity consumption by any device being monitored.

We are already familiar with Watts, as traditional incandescent light bulbs are sold by their wattage. A 40W light bulb produces less light than a 100W light bulb. But wattage is not the measure of light output; wattage measures energy consumption. Therefore a 40W light bulb consumes 40 Watts of electricity in an **hour of constant use**. A 60W consumes 60, and a 100W consumes 100.

The simple switch to more efficient lighting is the easiest way to realize energy savings almost immediately. By using compact fluorescent lights, LEDs or efficient hybrid lights, you can have the same quality of light at a fraction of the electricity consumption. Incandescent lights produce a tremendous amount of heat. Much more heat, in fact, than light. A 13W compact fluorescent light will provide the same amount and quality of light as a 60W incandescent.

What we pay for on our power bill is the total number of Kilowatt (kWh) hours we consume in a month., **KWh** is the measure of electricity consumption over time. One Kilowatt is 1000 Watts.

An electronic device, let's say an old refrigerator in the garage, that consumes 1000 Watts in an hour uses one kWh of electricity in that hour. **If that device is running non-stop for a month** of 720 hours, that is 720 kWh of consumption. Multiply that by the cost of electricity (which is around 10 cents/kWh at the time of this writing) and you get $7.20 of electricity consumption for that month for that one device.

Home Energy Monitor Worksheet

Device		A		B	A x B	÷ 1000 = kWh	X $0.10 = cost	X 30= monthly total	X 12= yearly total
TV	Watts on		Hours on						
	Watts off		Hours off						
Stereo	Watts on		Hours on						
	Watts off		Hours off						
	Watts on		Hours on						
	Watts off		Hours off						
Game	Watts on		Hours on						
	Watts off		Hours off						
DVD	Watts on		Hours on						
	Watts off		Hours off						
Cable Box	Watts on		Hours on						
	Watts off		Hours off						
Charger	Watts on		Hours on						
	Watts off		Hours off						
Microwave	Watts on		Hours on						
	Watts off		Hours off						
Toaster	Watts on		Hours on						
	Watts off		Hours off						
Alarm Clock	Watts on		Hours on						
	Watts off		Hours off						
Hair Drier	Watts on		Hours on						
	Watts off		Hours off						
	Watts on		Hours on						
	Watts off		Hours off						
	Watts on		Hours on						
	Watts off		Hours off						
Totals						kWh	$	$	$

How to Use the Energy Monitor

Let's start with the refrigerator. This is an appliance found in nearly all Pinellas homes. The refrigerator works just like an air conditioner with a thermostat. When the desired temperature inside is reached, the machine turns off. And when the temperature rises above a certain level, the cooling system turns on again. This is called cycling. Start your monitoring with the refrigerator, as it will need to be monitored for a longer period of time to get an idea of how much energy it consumes.

You may want to use an extension cord so you can easily read the monitor's display screen. Plug the extension cord into the wall, then plug the energy monitor into the cord. If you are using an extension cord, make sure it is a 3-pronged one. Now you can plug the refrigerator's power cord into the plug found on the face of the energy monitor.

If you are using an extension cord, make sure it is tucked safely away to avoid tripping over it while you monitor the refrigerator's energy use for the next 24 hours. After 24 hours, tap the **KWH** button on the energy monitor. It toggles between **KWH** and **HOURS**. You will be able to read how many hours it has been plugged in as well as energy used with this button. Tap this button until you see a number with KWH in the lower part of the screen. This is the kilowatt hour reading. Enter this number on the worksheet under kWh for the refrigerator. If you have a second refrigerator, test it the same way and add that to your worksheet.

Most water heaters, pool pumps, air conditioners and dryers are connected to the home's main power source. **DO NOT** attempt to monitor these. Only monitor those devices that will plug into the front of the energy monitor.

The rest of the appliances and devices, however, are easier to test. You can simply take the watts reading when the device is "on" and again when it is "off." If a device is showing that it is consuming watts when it is "off," that is what we call an "energy vampire." These are devices that use electricity even when you are not using them! Such "phantom" loss of electricity adds up. Nationwide, phantom energy loss costs the US $5 BILLION a year!

Test the television.

With the TV turned off, plug the energy monitor into the wall, then plug the TV into the monitor. Check the watts by pressing the Watt button on the energy monitor until you see a number followed by WATTS. Is the TV using any energy when it is turned off? Record this number on your worksheet in column A next to "Watts off." Now turn the TV on, and take the watts reading again. Big difference? Record this number next to the TV "Watts on." It is important to take watt readings while the energy monitor is plugged into the wall. The readings are not stored and if you unplug the energy monitor without taking the readings, they will be lost.

Now continue around the house, testing anything that is plugged-in. Often an appliance or other device will read "0" when off. That will make the math much easier later on! Check phone chargers, power adaptors, computers, toasters, microwaves, coffee pot, everything you can think of in your home that plugs-in and uses electricity.

Once you have thoroughly inspected your home and taken energy readings,

it is time to work on the worksheet. You will probably need a calculator for this exercise. Go ahead and test the calculator as you do the math!

You will need to estimate the number of hours you use each of the devices every day. Some might be easy, like an electric alarm clock is on 24 hours a day. With others, like the television, you may have to make your best guess on an AVERAGE number of hours per day. In the case of electronics that you use only briefly, like a hair dryer, divide the number of minutes you use the dryer by 60 to convert that duration to hours/day.

Once you have done your basic calculations you will begin to see what bits of electronic equipment use the most energy in your home. You can use the extra columns on the worksheet to learn more. Multiplying the amount of watts used by the number of hours used will give you a daily total for that device. Dividing that number by 1000 will show you the kWh of that device on that day. Multiplying kWh by the current price of energy ($0.10) will tell you how much each device costs to operate each day. You can then multiply by 30 to get a monthly total, and then by 12 for a yearly total.

While you conduct your home energy audit, think of ways you can bring all the numbers down.

- Use electronics fewer hours a day? Instant savings.
- Plug chargers and adaptors into power strips to eliminate phantom energy loss?
- Use the energy-saving settings on computers and laptops?
- Change out inefficient incandescent bulbs?

Do whatever makes sense for you and your family. These simple modifications and behavior changes will help you to realize energy savings throughout the house…

… and once again, thank you!

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Pinellas Energy Efficiency Project

This community-wide project hopes to save more than 3 million Kilowatt hours and 1,800 tons of CO_2 emissions

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