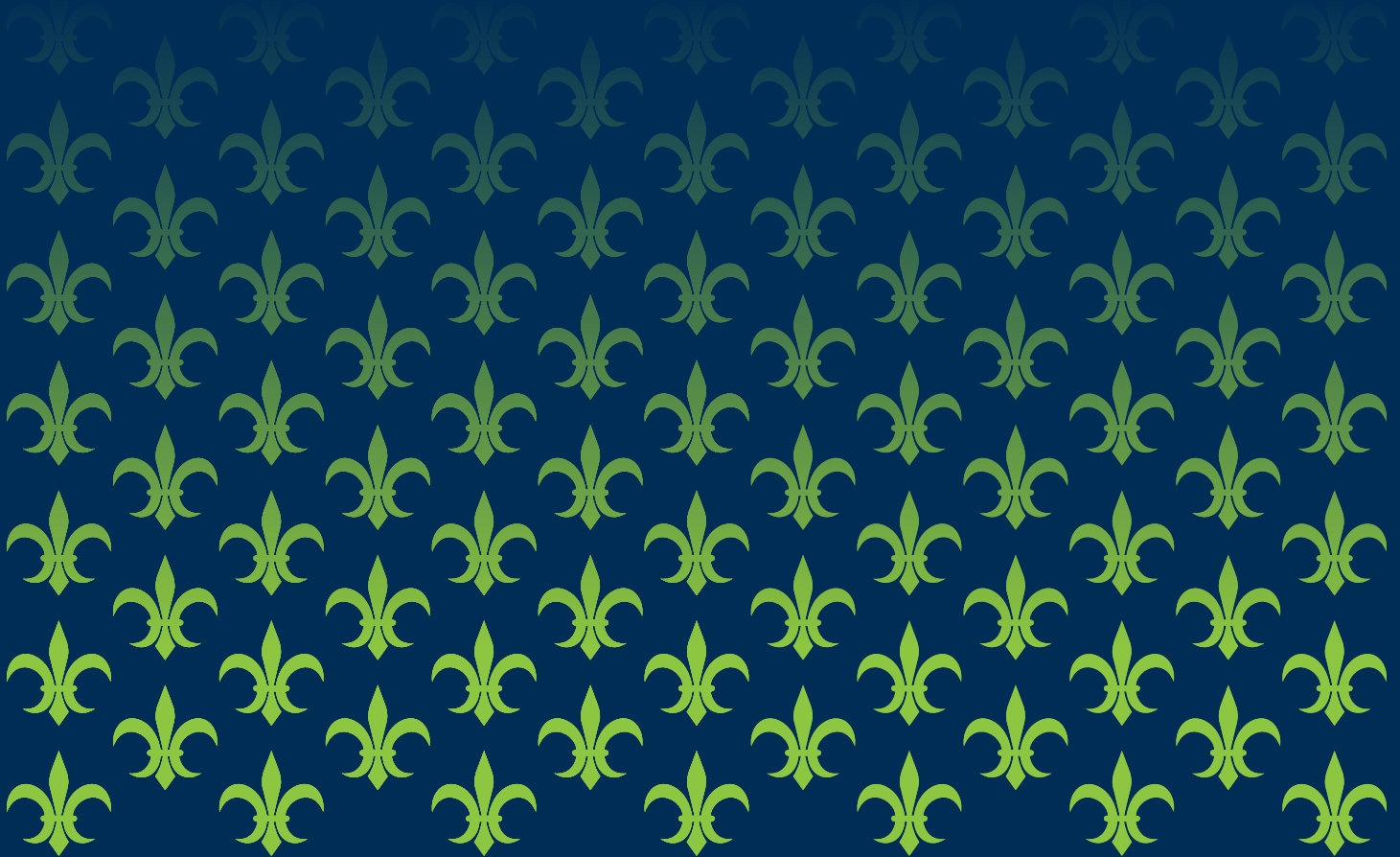


Appliances and the Energy They Use



Energy Smart is a comprehensive energy efficiency program developed by the New Orleans City Council and administered by Entergy New Orleans, LLC.
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APPLIANCES AND THE ENERGY THEY USE

Today we are going to examine one of the most important resources in our lives. It's the resource that allows our homes to be comfortable and bright, gives us a level of convenience never seen before in history, and makes its way into almost everything we do. That resource is energy.

Energy is, as scientists say, the ability to do work. Any time something is moving, heating up, making noise, growing, or changing in any other way, energy is present. Usually, we don't think about energy unless we suddenly can't use it. Mostly, adults think about energy use when they have to pay bills. So let's give it some thought, shall we?

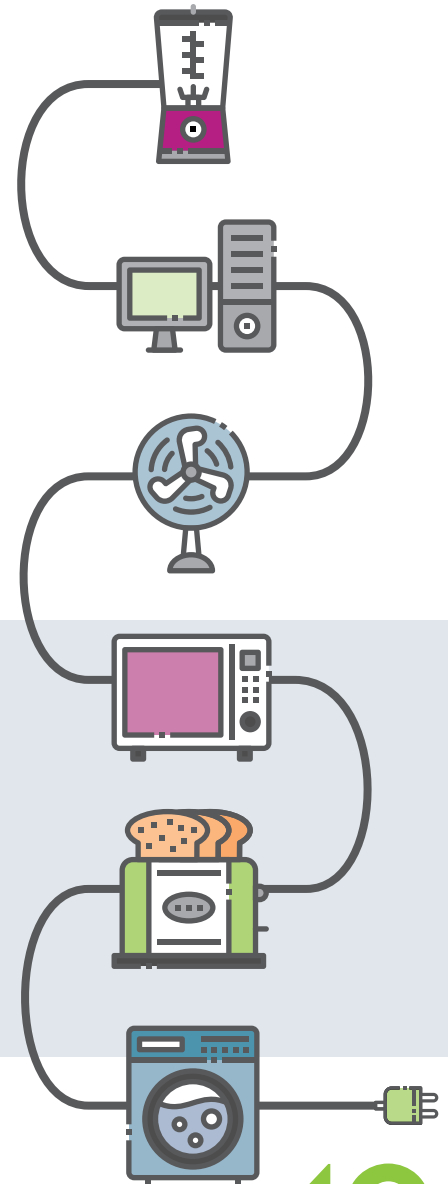
Energy efficiency is the process of using energy more wisely – in other words, doing more work while using fewer resources.

In this packet:

In this packet, you'll find interesting activities about one major area of home energy use: Appliances. Electronic appliances are anything that needs to be plugged in at some point in order to work, including items that need to be charged, like phones. The average American household has 40 appliances. Together, they account for about 15% of your home energy use.



But what appliances do you have, and how does your family use them? Could you save money by using them differently?



40

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ACTIVITY 1 • Essential Questions

Let's see what your thoughts are on some of these. You can look up the answers or take your best guess and test your knowledge.

How many appliances do you think you use in a day?

Is it better for your appliances to turn them off or leave them on?

How does your behavior reflect in your energy bill?

What is a phantom load?

K • W • L

You're about to do what's called an "audit." Basically, that means you're going to investigate what's going on. Right now, our audit is focused on the appliances in your home, which you probably haven't given much thought. Before you begin, fill out the first two parts of this KWL chart to figure out where you are in terms of lighting knowledge.

What I Know	What I Want to Learn	What I Learned
K	W	L



ACTIVITY 2 • Home Appliance Audit

Search your whole home for every appliance you can find.

The goal is to get as accurate an inventory as possible. Include chargers that are plugged in even if nothing is being charged. Those are called phantom loads, and we'll get to them later.

Remember to include items with plugs that you can't see, like your refrigerator.



Use this table to keep track. Place a checkmark in the last two columns if they apply.

Item	Room	In Use?	Plugged In?

ACTIVITY 2 • CONTINUED

How many appliances does your family have? _____

Let's think about them a little more closely:

1. Of the items that are plugged in, which ones should always be plugged in?
2. Which ones could you conveniently unplug?
3. Which of these items get used every day?
4. Which ones get used at least once a week?
5. Which ones get used at least once a month?
6. Which ones get used only a few times a year?
7. Look at your “plugged in” list. Which items that are plugged in have a light or clock on them while they're off or are warm to the touch?
8. How many of the items are used for cooking?
9. How many are for personal grooming?
10. How many are toys?
11. How many are not what you would call toys but are primarily for entertainment?
12. How many are for medical purposes?
13. How many don't fit into any of those categories? Could you create new categories for them?

What are your thoughts right now on your family's set of home appliances?



ACTIVITY 3 • Phantom Loads

Also called phantom charges, these are items that continue to use electricity even when they're off or otherwise not in use. Pretty much all of the items on your "plugged in" list but not on your "in use" list have a good chance of being phantom loads. Read the following articles to learn more.

Are Phantom Loads Adding to Your Electric Bill?

Written by Erin Huffstetler for thespruce.com, Updated 11/25/18

Phantom load, also known as standby power or vampire power, is the electricity consumed by an electronic device while it is turned off or in standby mode. It is the power that maintains your TV settings and keeps the clock going on your VCR and microwave, but this power comes at a price. A joint study between the U.S. Environmental Protection Agency and several other environmental agencies around the globe puts that price at a full 10% of your monthly energy bill!

Are phantom loads contributing an extra 10% to your energy bill? Refer to this list of common phantoms to find out:

TVs

VCRs, DVD players and DVRs

Cell phone chargers (and any other battery chargers)

Clock radios

Computers and printers

Coffeemakers

Power strips

Microwave ovens

Answering machines

Any device with a remote control

Any device with a clock

Any device that is programmable

Any device with a power light or standby indicator light



Have some of these phantoms in your home? If so, here are some simple changes that you can make to eliminate them.

HOW TO REDUCE PHANTOM LOADS

1. Unplug things, like chargers, which continue to draw energy when not in use.
2. Consider leaving your microwave and DVD player unplugged until you need it. It'll mean a few less clocks in your life, but that might actually be nice.
3. Plug all of your computer components into a power strip. Then, flip the strip off when you're done using your computer. Do the same for your TV, DVD player, and other home entertainment devices.
4. Set your computer to go into sleep mode when it's not in use.
5. Invest in Smart Strip power strips, which will automatically cut power to devices that aren't being used.

How to Save Energy by Eliminating Phantom Loads

Written by Greg Seaman for Eartheasy.com, February 9, 2010

AS LONG AS THEY'RE PLUGGED IN, ALL ELECTRONIC DEVICES - ANYTHING WITH A CLOCK, TIMER, ADAPTER, MEMORY, OR REMOTE CONTROL - CONTINUE TO DRAW POWER EVEN WHEN THEY'RE NOT IN USE.

Since most homes today have multiple electronic devices, the energy loss from phantom loads, also referred to as “vampire loads” or “standby power,” can be significant.

Electronics which remain on standby mode, where capacitors are filled with energy and ready to turn on the TV, etc., can use almost as much energy as being fully on.

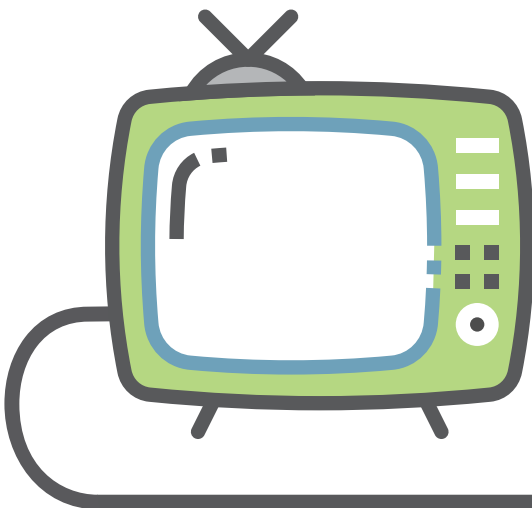
According to the U.S. Department of Energy, 75% of the electricity that powers home electronics is consumed while these devices are turned off! Most home electronics use “standby power” even when they're switched off.

Here are five easy but effective ways to reduce your phantom load:

1 Use “smart strips” or power bars.

Plug all your related electronics, like your TV and DVD player, satellite TV box, computer, modem, and printer, into a single power bar; then switch them all off at once from the power bar when you're not using them. A newer type of power strip called the smart strip can make this even easier. Use one with your computer or TV, and it turns off all the peripheral devices automatically. When you turn on your computer or TV, the peripherals will all turn on.

Another option, if you do not have a power bar, is to simply unplug any electronic device which is not in use.



2 Identify the prime sources of phantom loads.

Some electronic devices, especially those which have remote control and digital displays, use more energy when switched off than others. Inexpensive home power meters, such as the Kill-a-Watt, will identify which electronic devices are the biggest energy drains when switched off.

Another method for finding phantom loads is turning off all lights at night and looking for any small LED lights which are glowing in the house. Also, any device that requires resetting after a blackout or power surge is a likely cause of phantom load.

3 Unplug charged electronic devices.

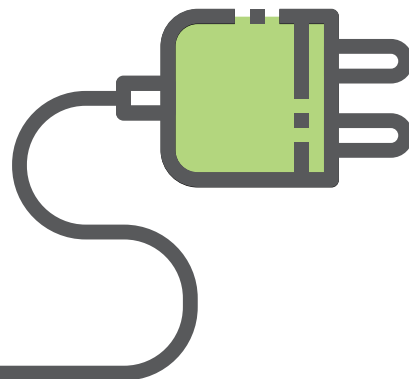
Unplug your cell phone, camera, and any other chargers as soon as the battery is fully charged. Unplug any remote charging stations, such as those used for recharging batteries used in digital cameras and small electronics.

4 Use “sleep” mode instead of a screensaver.

Contrary to popular belief, the screensaver on your computer does not save energy. If you’re leaving your workstation for more than a few minutes, enable the “power-save” or “sleep” mode on your computer.

5 Buy electronics and appliances with the Energy Star® label.

If you’re in the market for a new TV or other electronic device, look for one with the Energy Star label. They use up to 50% less energy than less-efficient models, while providing the same performance.



By eliminating phantom loads in the home and office, you can save up to 10% on your energy bills. And the process of identifying phantom loads increases awareness of overall energy efficiency in the home.

Calculating Phantom Loads



Go back to #7 in the list of questions. That is the list of phantom loads in your home. Here's a list of approximately how much each of those items uses each day while it sits plugged in. Mark the ones you have. This is by no means a complete list.

CATEGORY	<input checked="" type="checkbox"/>	DETAIL	ESTIMATED ENERGY USAGE*	ESTIMATED ENERGY COST**
Heating		Space heating, electric		
		Portable heater	(1,500W)1.5 kWh per hour	\$0.17 per hour
		Baseboard heater (six-foot unit)	(250 W/foot)1.5 kWh per hour	\$0.17 per hour
		Heat pump	10 kWh per hour	\$1.10 per hour
		Electric furnace	10.5 kWh per hour	\$1.16 per hour
Cooling		Window/wall (18kBtu) (240V)	1.8 kWh per hour	\$0.20 per hour
		Central (3 ton-12) SEER	3.0 kWh per hour	\$0.33 per hour
		Portable fan	0.03 kWh per hour	Less than \$0.03 per hour
		Ceiling fan	0.075 kWh per hour	\$0.01 per hour
Water Heating		Electric water heater	380-500 kWh per month	\$41-\$55 per month
Kitchen		Oven	2.3 kWh per hour	\$0.25 per hour
		Microwave oven	0.12 kWh per 5 min	\$0.01 per 5 min
		Coffee maker	0.12 kWh per brew	\$0.01 per brew
		Coffee maker/brew, warmer on	0.4 kWh per hour	\$0.04 per hour
		Dishwasher: normal cycle (not including hot water)	1-2.17 kWh per load	\$0.11-\$0.24 per load
		Dishwasher: Energy-saver cycle	0.5 kWh per load	\$0.06 per load
		Toaster (2 slices)	0.04 kWh per use	\$0.01 per use
		Toaster oven	0.75 kWh per hour	\$0.08 per hour
Refrigerator/ Freezer		Older units	150 kWh per month	\$16.50 per month
		Newer Units - Energy Star Refrigerators	34.5 kWh per month	\$3.80 per month
Electronics		Television		
		> 50" Plasma	0.48 kWh per hour	\$0.05 per hour
		40"-49" Plasma	0.4 kWh per hour	\$0.04 per hour
		> 50" LCD	0.016 kWh per hour	Less than \$0.01 per hour
		40"-49" LCD	0.012 kWh per hour	Less than \$0.01 per hour
		> 50" DLP	0.24 kWh per hour	\$0.03 per hour
		40"-49" DLP	0.2 kWh per hour	\$0.02 per hour
		30"-36" Tube	0.12 kWh per hour	\$0.01 per hour
	25"-27" Tube	0.09 kWh per hour	\$0.01 per hour	



CATEGORY	DETAIL	ESTIMATED ENERGY USAGE*	ESTIMATED ENERGY COST**
Electronics (cont.)	Recording/video playing devices		
	DVR (Tivo)	28.8 kWh per month	\$3.17 per month
	VCR	0.02 kWh per hour	Less than \$0.01 per hour
	DVD player	0.03 kWh per hour	Less than \$0.01 per hour
Gaming	Nintendo Wii	0.02 kWh per hour	Less than \$0.01 per hour
	Xbox 3600	15 kWh per hour	\$0.02 per hour
	Play Station	30.21 kWh per hour	\$0.02 per hour
Computers	Desktop computer	0.06-0.25 kWh per hour	\$0.01-\$0.03 per hour
	Desktop computer on sleep/standby mode	0.001-0.006 kWh per hour	Less than \$0.01 per hour
	Laptop	0.02-0.05 kWh per hour	Less than \$0.01 per hour
	Monitor - 17" CRT	0.08 kWh per hour	\$0.01 per hour
	Monitor - 17" LCD	0.04 kWh per hour	Less than \$0.01 per hour
Other	Speakers (25 Watts x 2) normal volume	0.05 kWh per hour	Less than \$0.01 per hour
	Stereo	0.05 kWh per hour	Less than \$0.01 per hour
	Radio, CD player	0.02 kWh per hour	Less than \$0.01 per hour
	Clock	2-4 kWh per month	\$0.22-\$0.44 per month
	Nightlight (4w on 12 hours/day)	1.44 kWh per month	\$0.16 per month
	Electric blanket	0.5 kWh per night	\$0.06 per night
Lighting	Incandescent bulb (40 W)	0.04 kWh per hour	Less than \$0.01 per hour
	Incandescent bulb (60 W)	0.06 kWh per hour	\$0.01 per hour
	Incandescent bulb (100 W)	0.1 kWh per hour	\$0.01 per hour
	Compact fluorescent (CFL) (11 W) equivalent to 40 W incandescent	0.01 kWh per hour	Less than \$0.01 per hour
	Compact fluorescent (15 W) equivalent to 60 W incandescent	0.015 kWh per hour	Less than \$0.01 per hour
	Compact fluorescent (27 W) equivalent to 100 W incandescent	0.027 kWh per hour	Less than \$0.01 per hour
Cleaning	Clothes dryer (light load vs. heavy load)	2.5-4 kWh per load	\$0.28-\$0.44 per load
	Washer, hot wash, warm rinse	6.3 kWh per load	\$0.69 per load
	Vacuum cleaner	0.75 kWh per hour	\$0.08 per hour
	Iron	1.08 kWh per hour	\$0.12 per hour
Bathroom	Hair dryer	1.5 kWh per hour	\$0.17 per hour
	Curling iron	0.05 kWh per hour	\$0.01 per hour



How much money do you spend each month on appliances and phantom loads?

STEP 1 We measure the energy we use at home in kilowatt hours (kWh). Examine your energy bill to find out how many kWh you use. The entire bill isn't just the energy you use; it also includes other fees and expenses. The amount of energy you use is listed in two places and circled in red:

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Service Location
xxxx xxxxxxxxxx
xxxxxx, xx xxxxx

Customer Service: 800-388-3749 (800-ENTERGY)
Residential: 7a-7p; Business: 9a-6p; Non-Fri
Power Outage or Safety Concern, 24 hrs/days
800-988-6243 (800-9OUTAGE)

Billing Period	Billing Cycle	kWh Used	Avg kWh Per Day
01/01/2020	30	1000	33.3

Amount Due by 01/15/2020: \$100.00

Account Detail	Amount
Previous Balance	100.00
Less Payment Charge	30.00
Payment Received	(100.00)
Payment Received	(100.00)
Remaining Balance	\$0.00

Current Charges	Amount
Energy Charge	100.00
Storm Restoration Offset	(0.00)
Fuel Adjustment	30.00
Federal Mandated EAC Rider	3.00
Municipal Franchise Fee	3.00
Total Metered Charges (Contract xxxxxxx)	\$100.00
Storm Restoration Charge	30.00
Current Month Energy Charges	\$100.00
Total Amount Due	\$100.00

Meter Reading (Contract xxxxxxx)	Value
Meter # xxxxxxx	Rate: LA_MS
Total Days (30)	
Current Meter Reading	1000
Previous Meter Reading	0
kWh Metered	1000

STEP 2 Appliances use about 15% of your total energy use. What is 15% of your total number of kWhs?

15% x your kWhs = _____

STEP 3 Each kWh costs 10.5 cents. To find out how much you spend on appliances, multiply the number of kWh you use on appliances by 10.5 cents.

10.5 cents x the answer of step 2 = _____

That's the amount of money you spend on appliances, including your phantom loads.

STEP 4 If 15% of your bill is for all your appliance costs, and 10% of your bill is just for phantom loads, that means that two-thirds of what you spend on appliances is pure waste. You spend twice as much money on appliances when you're NOT using them as you spend on appliances when you ARE using them.

How much do you waste on phantom loads in a year?
(There are several ways to find that number. You choose!)

What would you do with that money instead if you cut back on your phantom loads?

Have a conversation with your family. Which actions will you take to reduce your phantom loads?

APPLIANCES AND THE ENVIRONMENT



So much of our environmental impact is from the energy we use at home. Our local air quality and the effect we have on global climate change are both affected by our city's choices for energy sources.

We measure the energy we use in our homes in kilowatt hours (kWh). Because most of our energy comes from natural gas and other fossil fuels, each kWh we create emits about 3 pounds of greenhouse gas into the atmosphere. How many pounds of greenhouse gas will you prevent from entering the atmosphere if you eliminate phantom loads?

STEP 2 Look back at your total number of kWhs used. If 10% of those kWhs are wasted on phantom loads, how many kWhs are wasted on phantom loads?

STEP 3 Each kWh represents 3 pounds of greenhouse gas. How many pounds of greenhouse gas are emitted due to the appliances in your house?

Number of kWh x 3 pounds of greenhouse gas = _____

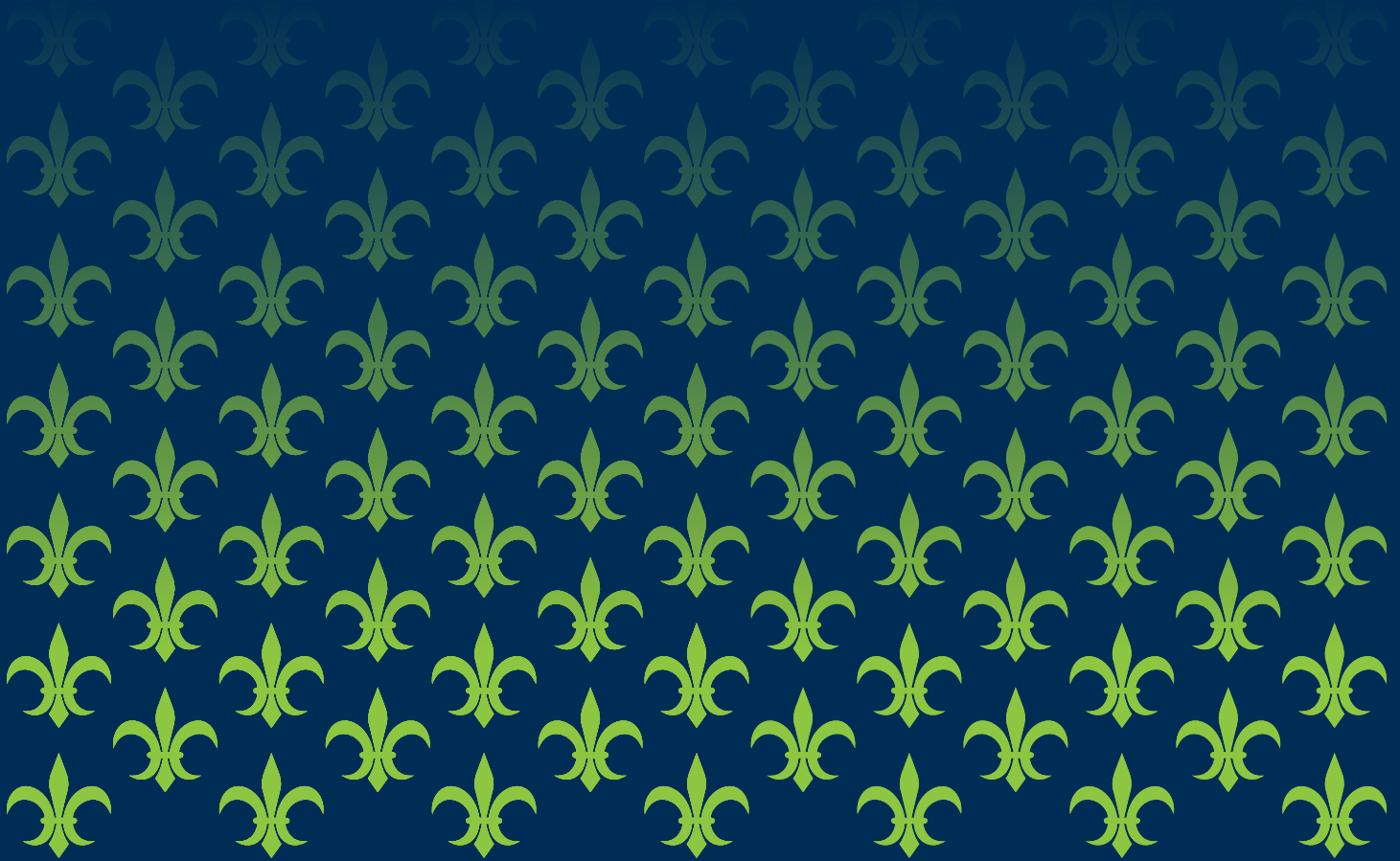
That is the number of pounds of greenhouse gas you will prevent from going into the atmosphere every month by cutting back on your phantom loads.

NOTE: This activity started with STEP 2 as shown above. Should that be STEP 1 or is there a step missing?



You've completed this set of activities on the impact of home appliances on your family and the environment. Return to the K-W-L chart and write out what you've learned.





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REFERENCES www.thespruce.com/are-phantom-loads-adding-to-your-electric-bill-1388205