HOME IDLE LOAD SELF-DIAGNOSIS AND ACTION GUIDE

Our homes consume energy all the time, even when we're asleep or away on vacation. This is referred to as a home's Idle Load, and it may represent as much as one-third of a household's total electricity consumption. Fortunately, there are easy ways to diagnose your total idle load, search out energy-wasting culprits, and lower your utility bill.

TYPES OF ALWAYS-ON DEVICES

There are three main categories of devices that contribute to electric Idle Loads:

1. **Electronic devices** that consume energy even when not being actively used. Examples include TVs, cable and satellite set-top boxes, VCRs, computers, game consoles, modems, networking equipment, and "smart" appliances, etc. This is the fastest-growing category. (For more details, see NRDC's Idle Load report _here_.)

2. **Infrastructure and other continuous loads**, including analog thermostats, doorbells, phones, clocks, GFCI (ground fault circuit interrupter) outlets, and continuous hot water recirculation pumps.

3. **Refrigerators**, freezers, icemakers, wine coolers, and anything else that keeps something cold all the time. While these devices need to stay on 24/7 to keep your food or drinks cold, unnecessary second or third fridges that waste a large amount of electricity can be removed, and recent models are much more energy efficient than older ones.

WAYS TO MEASURE YOUR HOME'S IDLE LOAD

The method used to determine a household's total Idle Load will vary based on the type of electric meter installed in your home and the capabilities of your electric utility. The three major scenarios are:

1. Best case: Home has a smart meter and the local utility supports Green Button data

Option 1: Use the free Green Button app www.UnplugStuff.com to find your home's Idle Load in watts. This tool also supports homes with solar photovoltaic (PV) panels installed.

Option 2: If your utility's website provides a chart showing your hourly electric use, you can identify your Idle Load by scanning that chart across a few typical days; look for the lowest value that occurs consistently (if your home has solar PV installed, you will need to exclude daylight hours). The values listed may be displayed in kilowatts or kilowatt-hours; if so, multiply by 1,000 to get watts.

2. Second-best: Home has a digital electric meter (but no Green Button data)

Step 1: Put your home "to sleep." Put all your appliances and lights in the state they are normally in when you sleep (e.g., turned off, in sleep mode, left on). Also temporarily set your fridge(s), freezer(s), heaters, and air conditioners to a temperature setting that ensures they will not come on and interfere with measurements. But don't unplug them or switch them off completely, because they may contribute to your Idle Load. If you have a solar PV system installed, you'll need to either disconnect it or perform this measurement at night when it is not generating.

Step 2: Go to your home's electric meter. The display on most digital electric meters cycles through a number of different readings every few seconds, and one of them is usually kilowatts, labeled kW. This is the current power draw of your house. If nothing is actively being used, then this is your home's Idle Load. Multiply this figure by 1,000 to get your home's Idle Load in watts.

NRDC

3. Worst case: Home has an analog electric meter (with a spinning disk)

Step 1: Put your home to sleep, as described above.

Step 2: Go to this webpage (http://standby.lbl.gov/electrometer.html) by Lawrence Berkeley National Labs for detailed instructions on how to read analog meters.

If the total is more than 185 watts, you're among the half of homes that have the highest Idle Load, and you probably have easy opportunities to reduce it. If it's greater than 282, you're in the quarter of homes that have the very highest Idle Load. In any case, now that you have your total, it's time to figure out the devices contributing to it and determine how you can reduce your Idle Load.

TAKING AN INVENTORY OF ALWAYS-ON DEVICES

Devices that contribute to a home's Idle Load are often referred to as "vampires" for two reasons: they suck energy around the clock, and they are often invisible to us.

It's therefore a good idea to do an inventory of all the electric devices in your home, both those plugged into an outlet and those connected permanently to the building's electrical wiring (like a GFCI outlet or a pool pump).

Do this by walking through each room and noting all electric devices, listing them either in a spreadsheet (see sample *here*) or on a simple sheet of paper. Don't forget to look in bathrooms and closets; under sinks; in the attic, basement, and garage; and outdoors. A few suggestions:

- Write down the model and location of the device (which room?) for easy reference.
- Check whether the device and any associated power adapter (the little black box box connected to the plug) feel warm to the touch. If so, note this in the inventory, because it's usually a sign that they contribute significantly to your home's Idle Load.
- If you discover unknown, forgotten, or unused devices during the inventory, use this opportunity to unplug or get rid of them. (One less item on the list!)

When the list is complete, the next step is to figure out how much each device contributes to the home's Idle Load.

MEASURING ALWAYS-ON LOADS

There are two primary approaches to determining the contribution of devices to a home's Idle Load: measuring the device directly, or identifying the circuit breaker it is on and measuring the impact of turning off that breaker.

Measuring a specific device

Use a Kill A Watt meter or similar power meter. The Kill A Watt is about $30 online, or you might be able to borrow one from your local public library.

Unplug the device you want to measure (shut it down correctly first, if appropriate). Then plug it into the Kill A Watt meter. Make sure the device comes back on, place it in the state it's normally in when your home is unoccupied, and then wait for the "watts" reading to stabilize. Record this reading as that device's contribution to the home's Idle Load.

Using the circuit breaker method

There is little risk in this method, but only those comfortable with electric panels and circuit breakers should attempt it.

This method is required for most 220V devices (electric vehicle chargers, water heaters, clothes dryers, ovens) and for hardwired devices (pool pumps, solar panel inverters, doorbells).

1. Again, make sure your home is in "sleep" mode.
2. Record the current Idle Watts at your electric meter (per the instructions above).
3. Shut off the circuit breaker you want to test. Record the new Idle Watts value. If there are devices on that circuit that contribute to the home's Idle Load, the new value will be smaller.

4. Record the difference between the new value and the previous one as the Idle Load contribution of the particular electric circuit controlled by that breaker. It's important to measure when switching off rather than when switching back on because many devices have a "startup" mode that fluctuates for some time, which may distort readings.

5. Continue shutting down other circuit breakers of interest. Note: once all the circuit breakers are closed, the electric meter should read zero kW.
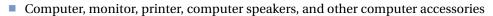
REDUCING YOUR IDLE LOAD

The good news about home Idle Load is that there are many no-cost or low-cost actions that consumers can take to reduce it, ranging from very simple and easy to implement to more time-consuming actions.

Do-It-Yourself Guide to Reduce Your Home Idle Load

- **Unplug** devices that are no longer used or are used very rarely, e.g.:
  - The TV and DVR in the guest bedroom
  - A second fridge when you don't need it. Consider getting rid of it altogether, as the old fridges found in garages and basements are typically energy hogs.
  - The furnace in the summer (switch it off if hardwired).

- Plug devices into a **power strip**, including:
  - TV, speaker bar, and other TV accessories. These can all be switched on and off manually with a power strip. Better yet, use an advanced power strip that automatically turns off the TV, sound bar, and other devices when no one is using them.
  - Computer, monitor, printer, computer speakers, and other computer accessories
  - Internet radio if it uses more than a couple of watts in standby with Internet connection

- Plug some devices into a **timer** (also called a scheduler) so they will go on only during normal times of use. Choose a digital timer over a mechanical one, as digital models typically have lower standby loads. Do this for your:
  - Hot water recirculation pump
  - Instant coffeemaker
  - Towel heater
  - Heated bathroom floor

- **Adjust** power settings:
  - TV quick start: This can use as much as 37 watts 24/7 in some models. Disable this setting if it uses more than a couple of watts.
  - Computer: Set your computer to go to sleep after 30 minutes (or less) of inactivity. Turn it off when you've finished using it.
  - Game console: Disable the "instant on" mode if you don't need it.

Note: Many utilities offer financial incentives for some of these actions, such as recycling an old fridge, buying smart power strips, etc. You can search for these online, or call your utility for information.

GOOD LUCK WITH YOUR IDLE LOAD WASTE REDUCTION PROJECT!