Question: I want to save energy at home, but I'm not sure what's really worth it. Should I unplug everything I'm not using? What would really make a difference?

Answer: To save energy at home, most of us have heard rumors of "energy vampires", or been told to turn our computers all the way off when they're not in use and been advised not to leave chargers plugged into the wall. Perhaps you've been given a free LED lightbulb at an event.

A lot of this advice is misleading or simply outdated. It can make you think that leaving your phone charger plugged in is a big problem, and that by removing it, you are saving lots of electricity. It can also lead you to believe that replacing your light bulbs with LEDs is the most important change you can make. None of these things are true.

Modern smartphones go from totally dead to fully charged using the same amount of energy it takes to run a standard 1000-Watt microwave for 45 seconds. If you leave them plugged in after they are charged, they draw so little electricity that standard home meters can't even measure it[1].

1: https://www.howtogeek.com/231886/tested-should-you-unplug-chargers-when-youre-not-using-them/)

The same is generally true for modern laptop computers. If you are a person who uses a laptop computer and a smartphone and maybe a tablet, direct your electricity-saving energy elsewhere and don't bother shutting your devices all the way off or unplugging the cords.

Desktop computers do use considerably more electricity, and there are a few tech appliances – most notably DVRs – that are serious energy hogs[2]. If you have a DVR, definitely consider turning it off!!

2: https://www.howtogeek.com/197733/ask-htg-do-cable-boxes-and-dvrs-really-use-that-much-power/

But even the energy guzzled by a DVR is dwarfed by the energy used to heat hot water, and run a clothes dryer. If you're going to reduce your energy usage at home, THAT is where you should start.

Running even an Energy Star dryer (either gas or electric) uses a ton of energy, about 2.5 kWh. Drying a single load is equivalent to running 2.5 standard microwaves at 100% power for a full hour. Hot water uses even more. Taking a 10-minute shower (not overly hot) in a low-flow shower uses about 5 kWh, or the equivalent of 5 standard microwaves running at 100% power for a full hour. If you wash your clothes in hot water, that uses a lot of energy, too.

Put another way, you would have to go out of your way to unplug 2 laptops, 2 phones, and 2 tablets for about 9,000 hours each (that's a YEAR) to save the same amount of energy as skipping ONE SINGLE DRYER LOAD, or 5 minutes in the shower.

How does this compare to turning off the lights? Well, using an old 60W lightbulb for 1 hour less per day, every day for a year, will save you about 20 kWh per year. That's the same as skipping 8 dryer loads or 2 10-minute showers (or 1 10-minute shower with a high-flow showerhead). That's nothing to sneeze at; you should definitely turn off your lights if you're not using them. If you have LED bulbs, using 1 standard bulb for 1 hour less per day, every day for a year, will save you 2 kWh per year, or 1 dryer load.

So, taking shorter showers, considering showering less often if that works for you, washing your clothes in cold water, and using your dryer as little as possible are important and easy(ish) ways to use less energy!

However, if you really want to get serious about your home energy use, then you should know that the biggest energy hog in your house is almost certainly either heating (if you live in a climate where it gets cold) or cooling (if you live somewhere hot). If you live in the northern half of the US, heating and cooling probably accounts for HALF of your annual energy use! Most people these days have access to a thermostat with some kind of basic scheduling function, so you can avoid heating or cooling fully when you're not at home. Zoned heat is also helpful (heating low-use areas less), and if you don't have it or don't use it, it would be helpful to start. Using these tools, you might be able to significantly reduce your energy use due to heating or cooling without modifying your house or heating systems.

What if you're even MORE serious about reducing your energy use or carbon footprint at home? Let's think about how to keep a house warm. It's going to be the same temperature inside no matter what kind of heating system you have. You could run an oil or gas furnace, an electric furnace, burn wood or pellets, or use a heat pump (either air-source or earth-source). These options differ in cost and in carbon footprint.

An oil boiler will produce about 500 grams of carbon dioxide emissions just to increase the temperature of your home by about one and a half degrees! (Over the course of an average day, not even an especially cold one, that means it would be producing FIFTY POUNDS of carbon dioxide gas!) A gas furnace will produce about 300 grams. An electric baseboard heater, about 250 grams depending on where your electricity is generated. An air source heat pump will produce just 150 grams, and an earth source heat pump even less than that. And the emissions from any method of heat that uses electricity can be further reduced by using clean electricity, whether it's from municipal sources or rooftop solar panels.

This means you can reduce your home heating footprint by 70% if you switch to using a heat pump. That's big!

Now that we've come to the end, you might ask – does it really matter what I do at home? Since even the least efficient oil heater produces only a tiny fraction of humanity's massive carbon footprint, what's the point in making the effort or spending the money? This question doesn't have as clear an answer, but let's do a thought experiment.

1. Residential energy use accounts for 20% of greenhouse gas emissions in the United States. (Of this, heating and cooling, not counting hot water, are about 45%.)
2. Overall, energy use needs to be reduced 45% from 2010 levels in order to avoid warming the earth more than 1.5 degrees C. (Yes, this is for the whole world, not just the US, but stay with me.) The US has already reduced emissions by about 10% since then. We've got about 35% more to go.
3. If everybody reduced their residential energy use by 75%, we would reduce US emissions by about 15%, and we would therefore by more than halfway to the emissions reduction target. It would be a HUGE deal.
4. It is true that not everybody is going to voluntarily choose to reduce residential energy use by 75% or more. However, that does not mean that choosing to do so is a futile or meaningless action. In addition to being a real (if small) reduction in emissions, it will inspire others, help to jump-start the clean energy industry, and reduce the need to do such work at a later date. Nobody can fix this alone, and somebody has to lead!