

NREEd: Energy Use Scavenger Hunt

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Background

In modern times, it is very difficult to go a day without using electricity. Even when out camping, most people take cell phones or GPS devices. Even if they are not plugged in, they are using a battery to provide them with electricity. All of this electricity has to come from somewhere. Currently in the United States, most electricity is produced by burning fossil fuels, which are non-renewable. These sources will eventually be exhausted, therefore it is important to consider other sources for our future energy supply.

NREL studies renewable energy sources and energy efficient technologies. With this focus, we envision a future where most of the electrical energy needs of the world will be met by electricity from renewable energy sources like wind and solar. Even so, we can always consider ways to use less electricity and conserve energy.

How Much Energy Does One House Need?

Go on an energy scavenger hunt. How many things in your house are currently using electricity? Use the list provided as a guide. Use the blanks on the last page to add anything extra you find using electricity. You may or may not fill in all the extra lines but see if you can find things that are not included.

How many lightbulbs does the house have? _____

How many of them are turned on right now? _____

How many TVs does the house have plugged into the wall? _____

How many are turned on right now? _____

How many alarm clocks does the house have plugged in? _____

How many chargers does the house have plugged in? _____

How many are charging something? _____

How many appliances are there in the kitchen? _____

How many of the are currently using energy? _____

In the bathroom, how many things are plugged in?

How many toys require electricity?

Remember, batteries are just stored electricity!

In your bedroom, how many things are plugged in?

How many total things did you count?

All the things you counted are currently using energy, even if they are off. You can lower the amount of electricity your house is using by unplugging things that aren't in use. This includes small things like chargers!

The Science!

I counted the light bulbs in my house. I have 46. Each of those lightbulbs takes 13W (.013kW) of energy. The average amount of time a lightbulb runs in my house is about 4 hours (some are on longer, some are on shorter). Using these values, I can quickly calculate how much energy just the lightbulbs in my house use.

$$4 \frac{\text{hours}}{\text{day}} \times 365 \frac{\text{days}}{\text{year}} \times .013\text{kW} = 19 \text{ kilowatt} \times \text{hours (kWh)}$$

$$1 \text{ ton of coal} = 2460 \text{ usable kWh}$$

$$\frac{\text{Used kWh}}{2460 \text{ kWh}} = \text{tons of coal}$$

$$\frac{19\text{kWh}}{2460 \text{ kWh}} = .008 \text{ tons of coal}$$

$$1 \text{ ton} \approx 2200 \text{ lbs}$$

$$.008 \times 2200 = 17.6 \text{ lbs of coal}$$

While that might not seem like that much energy, lights are not the only items in a house that consume energy, and I use energy efficient light bulbs. If a house is still using incandescent lightbulbs, for the same amount of use, the light bulbs would require 81 lbs. of coal. Choosing energy efficient light bulbs and appliances can really lower the amount of energy a house uses. It's also very important to turn off unnecessary lights and appliances and unplug unused chargers.