

Electrical Consumption Worksheet

Name: _____

1. Use a Kill a Watt device to investigate electricity consumption of appliances around your home.
2. Pick one item to investigate and complete the following table using a data from the Kill a Watt device and a calculator:

| | | |
|---|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| | Item Name: | |
| A | Energy Consumption Reading (kWh) from Kill a Watt device | kWh |
| B | Elapsed Time Recorded by Kill a Watt device (press "KWH/Hour" button to get to clock) | Hours |
| C | Average Hourly Consumption (Divide Answer for A / Answer for B) | kWh/hr |
| D | Average Annual Energy Consumption (Answer for C x # hours used per day X 365) | kWh |
| E | Price of a Kilowatt Hour August 2017 | \$0.09345 per kWh <i>Duke Energy Carolinas</i> \$0.08903 per kWh <i>Duke Energy Progress</i> |
| F | Annual Operating Cost (Answer for D x E) | \$ /year |

3. Visit EPA's *Power Profiler* at <http://www.epa.gov/energy/power-profiler> and enter your zip code to determine what energy sources ("fuel mix") are used for electricity generation by your energy provider. *Depending on your zip code, you may be asked to indicate your utility.* What two fuels are responsible for most of the electricity generated by your provider? _____ (%) & _____ (%)

4. You'll see from the graph that in your region (SERC Virginia/Carolina) **coal provides ~32% of the energy** used to generate the electricity. In the Southeastern US, approximately 1 pound of coal is required to generate 1 kWh of electricity*. Calculate the amount of coal required to power the item above for one year.

| | | |
|---|--------------------------------------------------------|---------------|
| G | Pounds of coal used (Answer for D from above x .32) | lbs coal/year |
|---|--------------------------------------------------------|---------------|

5. Calculate the amount of emissions* that result from burning this coal by completing the table below.

| | | |
|---|-------------------------------------------------------------------------|---------------------------|
| H | Pounds of CO ₂ emitted/year (Answer G from above x 1.4lb) | lbs CO ₂ /year |
| I | Pounds of SO ₂ emitted (Answer G from above x 0.006lb) | lbs SO ₂ /year |
| J | Pounds of NO _x emitted (Answer G from above x 0.003lb) | lbs NO _x /year |

*Source: *Kilowatt Ours* Companions Curriculum

6. The second graph of EPA's *Power Profiler* shows the air emissions associated with this fuel mix profile.
 - a. Describe your observations as you compare regional and national CO₂, SO₂, and NO_x emissions from power plants.
 - b. How do these emissions impact the environment and human health?
 - c. What other pollutants of concern are emitted from coal-burning power plants?
7. List ways to reduce the amount of electricity consumed by this item (e.g., only plug it in when you need it).

Central AC
3500 kWh/yr



Central AC – Energy Star
1850 kWh/yr



Clothes Washer
173 kWh/yr



Clothes Washer – Energy Star
135 kWh/yr



Clothes Dryer
193 kWh/yr



Clothes Dryer – Energy Star
149 kWh/yr



Residential Lighting (Interior & Exterior)
1700 kWh/yr



Toaster Oven
60 kWh/yr



Laptop Computer (8 hours/day)

146 kWh/yr



Desktop Computer (8 hours/day)

282 kWh/yr



Coffee Maker

42 kWh/yr



Refrigerator/Freezer

1752 kWh/yr



Refrigerator/Freezer – Energy Star

606 kWh/yr



AC Window Unit

1926 kWh/yr



AC Window Unit – Energy Star

706 kWh/yr



Ceiling Fan

324 kWh/yr



Microwave Oven

90 kWh/yr



Hot Water Heater

4879 kWh/yr



Hot Water Heater – Energy Star

4622 kWh/yr



42" LCD TV (6 hours/day)

187 kWh/yr



42" LCD TV (6 hours/day) – Energy Star

122 kWh/yr



Oven

624 kWh/yr



Dishwasher

468 kWh/yr



Dishwasher – Energy Star

199 kWh/yr

