



Energy Consumption

What uses less energy per hour: The Nintendo Switch or the Xbox Series X?

6th Grade

Wiesbaden Middle school



Energy Consumption

Earth Day



6th Grade

Wiesbaden Middle school



Energy Consumption

PART I

What is energy consumption?



What is energy consumption?

The amount of energy consumed by an individual or organization.

World Energy Consumption is the total energy produced and used by the entire human civilization.

What things do you use daily that consume energy?

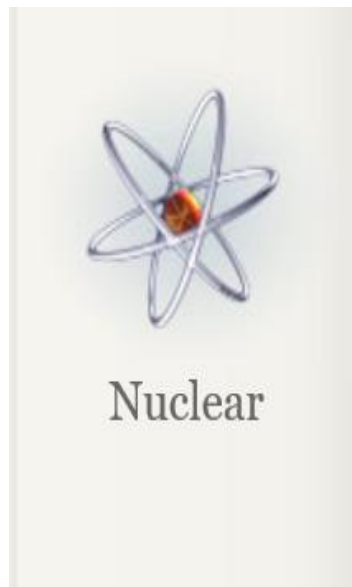
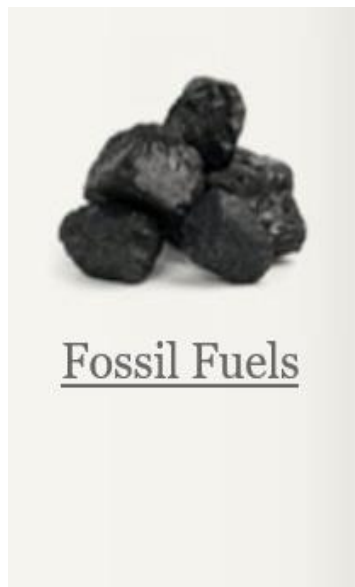
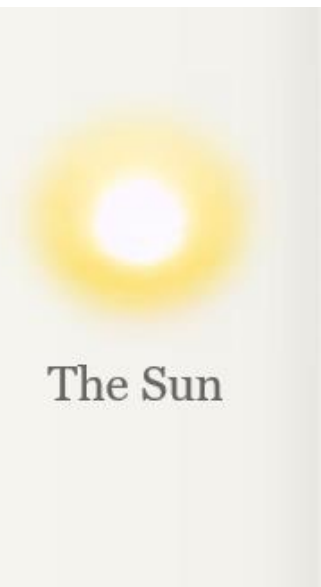


Energy Consumption

PART 2

Where do we get energy from?

Where do we get energy from?





Energy Consumption

PART 3

How do we use energy?



How do we use energy?

1. Residential – Our home
2. Commercial – buying and selling products
3. Transportation – moving people and cargo
4. Industry – making products for people to use



How do we use energy?

With less than 5% of the world's population, the U.S. consumes 17% of the world's energy

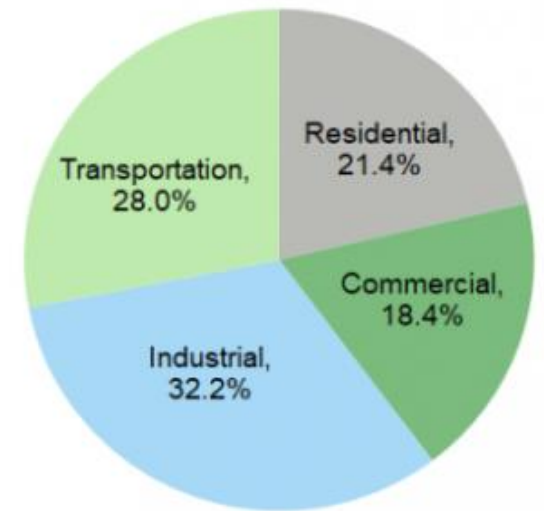
According to the U.S. Energy Information Administration (EIA), the average American monthly consumption of electricity is 914 kWh kilowatt-hours (kWh) per household.

Depending on the size of your family, that is between

10-12 kWh per person per day.

What is a kilowatt hour anyway?????

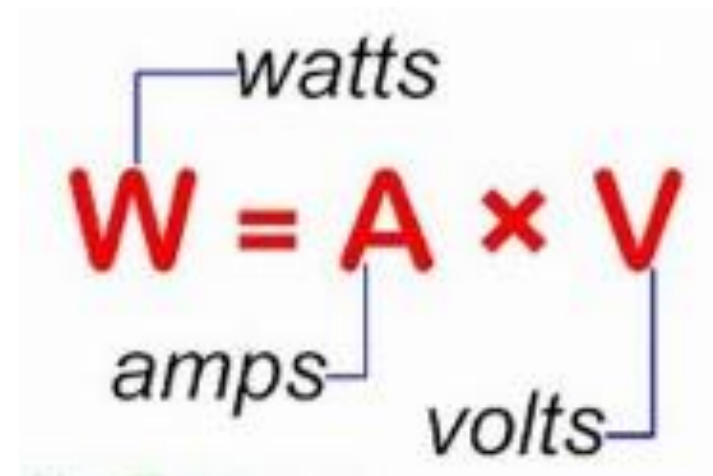
U.S. ENERGY CONSUMPTION BY SECTOR, 2018*



How do we use energy?

It's all about the WATTS!!!!

WATTS = Amps x Volts

A diagram showing the formula $W = A \times V$ in large red letters. A blue line connects the 'W' to the word 'watts' above it. Another blue line connects the 'A' to the word 'amps' below it. A third blue line connects the 'V' to the word 'volts' below it.
$$\begin{array}{c} \text{watts} \\ | \\ W = A \times V \\ | \quad | \\ \text{amps} \quad \text{volts} \end{array}$$



How do we use energy?

Next.... Change your WATTS to kilowatt-hour.

USE THIS CALCULATOR: <https://www.calculatorology.com/watts-to-kwh-calculator/>

A kilowatt-hour, otherwise known as a kWh, is a way to measure how much energy you're using over time.



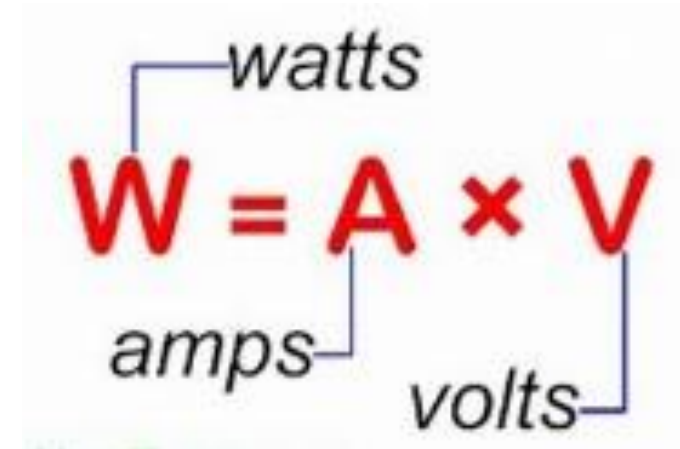
Energy Consumption

PART 4

How much energy do I use?

How much energy do I use?

It's all about the WATTS!!!!

A diagram showing the formula $W = A \times V$ in red. Blue lines connect the letters to their units: 'W' to 'watts', 'A' to 'amps', and 'V' to 'volts'.

A = the amps, you can find this on the back of your electronic device.

V= volts, in Germany we use 220V, in the U.S. we use 110V



How much energy do I use?

Remember earlier in the presentation, I asked you “What things do you use daily that consume energy?”

Lets start by taking a look at the back of those items and find the ampere, also known as amps or A on the back of your electronics

****If your electronic has 2 numbers for amps, choose the smaller number.

This number is the A in the formula: $W = A \times V$
Remember V (volts) in Germany is always 220.

FILL IN YOUR FORMULA!!! THEN SOLVE.

***This number will also tell you what size transformer you need if need a transformer.



How much energy do I use?

Next.... Change your WATTS to kilowatt-hour.

USE THIS CALCULATOR: <https://www.calculatorology.com/watts-to-kwh-calculator/>

You could complete this for all of the energy you use during the day and add it up.

Do you use between 10 -12 kWh per day like the average American?



Energy Consumption

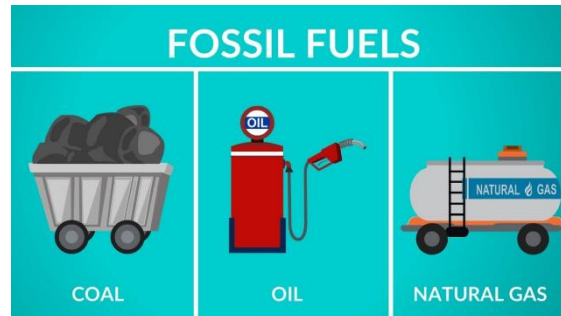
PART 5

Effects of Energy Consumption

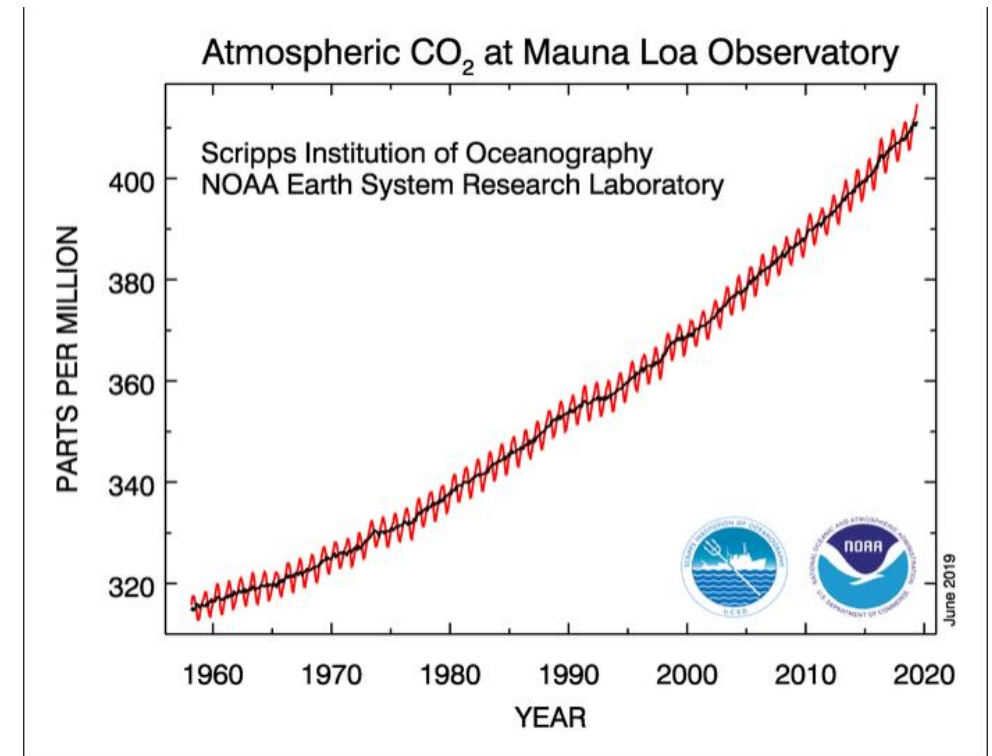
Effects of Energy Consumption

Some Environmental Impacts -

Fossil Fuels –



- The use of fossil fuels releases carbon dioxide (CO₂) and many other greenhouse gases which is the primary cause of global warming.
- By current estimates, 79% of U.S. energy will come from fossil fuels in 2050.
- Nearly all climate scientists agree that increases in atmospheric CO₂ (fossil fuel use) is to blame for the rising global temperatures.



Effects of Energy Consumption

Some Environmental Impacts –

Wind Turbines –

- alter landscapes in ways some find unappealing and can increase bird and bat mortality



Nuclear Power–

- radioactive waste and a high energy requirement to build the plants and mine the uranium



Hydroelectric Power Plants–

- cause habitat degradation and kills fish



Effects of Energy Consumption

WE ALWAYS WANT MORE!!!

The International Energy Agency estimates that the worldwide energy demand will increase by 30% by 2040.

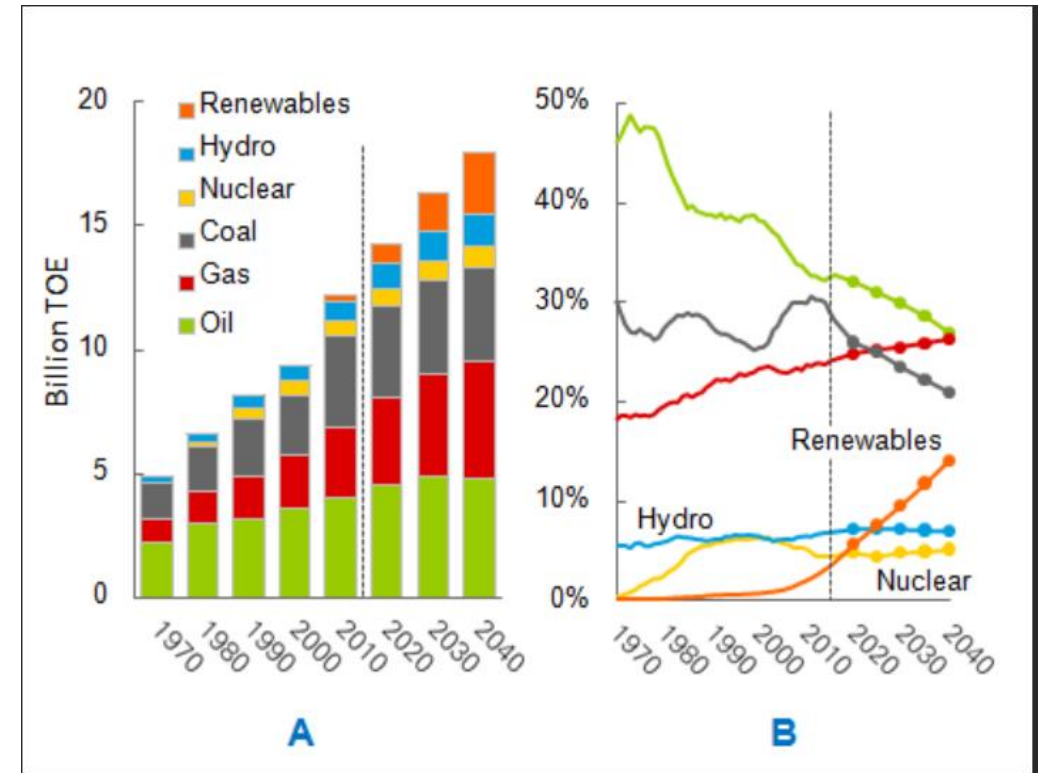
Things to think about:

Will we run out of energy?

What countries supply the most energy sources?

Could the United States provide its own energy without the aid of other countries?

What is renewable energy anyway?



A) Worldwide primary energy consumption, by fuel, 1970-2040; B) Share of primary energy consumption, by fuel, 1970-2040. From BP 2018 Energy Outlook.



Energy Consumption

PART 6

What can I do to conserve energy?



What can I do to conserve energy?

1. Turn off the light when you leave your room.
2. Sleep your computer when you are not using it.
3. Turn your video games off when your are done playing.
4. Shower with a timer one so you don't waste water. It take energy to heat the water.
5. Put more clothes or blanket on when it's cold.
6. Turn off and unplug appliances when not in use.
7. Dry your clothes in fresh sunshine.
8. Watch less TV – Read a book.
9. Go outside and PLAY!!! YAY!!!



Energy Consumption

PART 7

How has COVID-19 affected energy consumption?

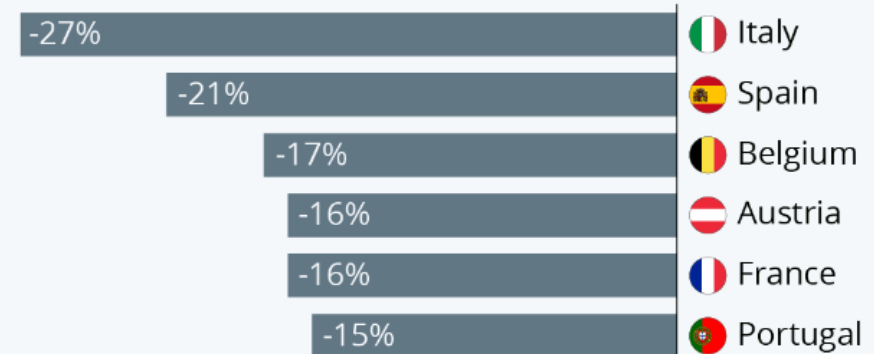
How has COVID – 19 affected energy consumption?

With schools, offices and factories closed across Europe as a response to the coronavirus pandemic, the energy requirements of most countries are currently considerably lower than usual.

While those now working from home will notice an increase in their energy costs, the overall story is one of reduction.

How Covid-19 is affecting electricity consumption

Change in electricity consumption in selected countries on 8 April 2020 compared to 2019*



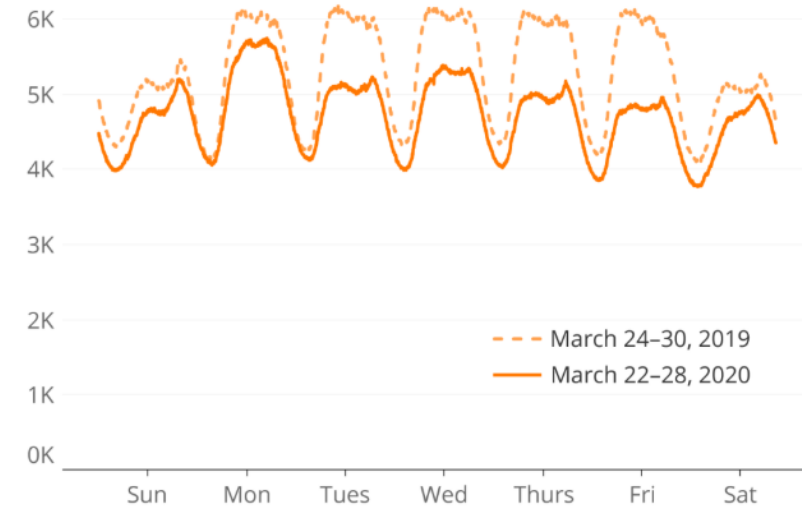


How has COVID – 19 affected energy consumption?

Energy usage in America has fallen to a 16-year low.

Powering down

New York City load, megawatts

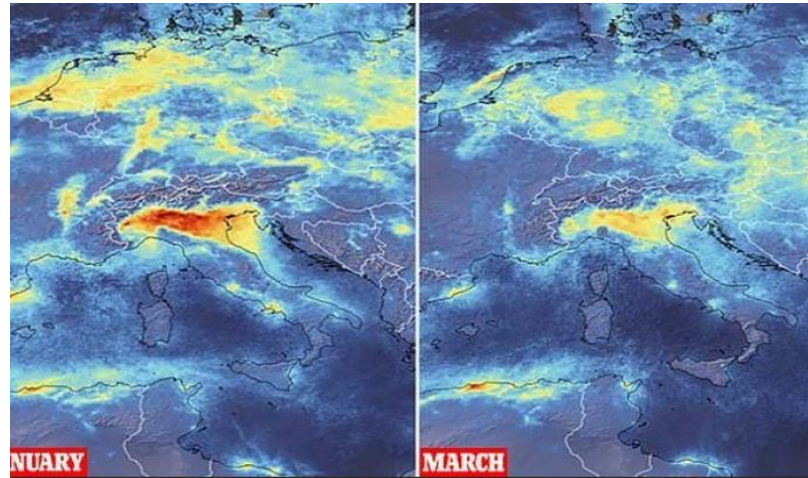


Source: New York Independent System Operator

grist

How has COVID – 19 affected energy consumption?

Global air pollution has declined. This satellite image shows lower NO₂ levels over Italy.



<https://www.youtube.com/watch?v=pFfqU1nKoqA>

<https://www.youtube.com/watch?v=bhctp3RQAkA>



Questions/Fun facts?

Fun Fact:

Amazon Echo, Telling a Joke = 4 watts per joke

What uses less energy per hour: The Nintendo Switch or the PS4 Pro? If you can figure out how many watts each uses, you can use the consumption calculator to figure this out.....



Sources (Energy Consumption)

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