Unit 1- Climate Change & Fossil Fuels

Objective: Students will be able to define climate change and analyze the various ways in which human activities contribute to its progression

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What is Climate Change?

"Climate change doesn't just raise temperatures. It can make winters colder and storms more intense. It heats the ocean; it leads to flooding and more wildfires. It kills animals, plants, humans and much more." (Christensen, 2019)

According to the United Nations and NASA, climate change is referred to as "long-term shifts in the temperatures and weather patterns" or "long-term change in the average weather patterns that define earth's local, regions, and global climates". In other words, climate change is the changing Earth's natural climate cycles. Some of these changes look like extreme droughts and heatwaves, flooding, hurricanes, and wildfires.

Causes of Climate Change

Global warming caused by human activities (Turrentine, 2022)

Humans are the primary driver of climate change as we are responsible for burning fossil fuels to create energy. These actions have increased the presence of greenhouse gasses.

The Main Greenhouse Gasses:

1. Carbon Dioxide
2. Methane
3. Nitrous Oxide
4. Water Vapor (not a direct cause to climate change)

When we release too many of these gasses into the atmosphere it creates an overload of the greenhouse effect. This effect is what "traps" heat to make Earth livable. The problem with an overload is it causes global warming because excess heat cannot escape back into space. It becomes a domino effect of events. Humans burn non-renewable energy; releasing an excessive amount of CO2 into the atmosphere; raising the Earth's temperature and causing global warming; prolonged global warming creates extreme changes in the climate. Climate change impacts everybody but it affects everyone in different ways.

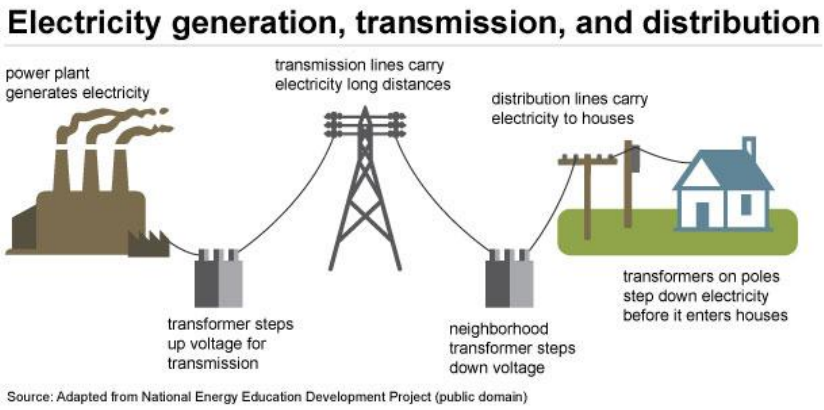
There is no conversation on climate change without understanding what fossil fuels are.

What are Fossil Fuels?

These are non-renewable energy resources that were formed over millions of years from living organisms. These include:

- Coal
- Oil
- Natural gasses: methane gas

US Electricity & Fossil Fuels



Humans drill into the Earth to mine the resources and burn them to create energy that is commonly used for supplying electricity to our homes, heating and transportation. Most of our energy is produced in a power plant facility. It is vital that we recognize that humans burning fossil fuels are the main source of global warming emissions (Union of Concerned Scientists). According to the US Energy Information Administration, in 2023 about " 60% of this electricity generation was from fossil fuels—coal, natural gas, petroleum, and other gasses."

Questions to Consider in Class

- Where does the majority of the energy we use go towards?
    - Homes and transportation: Lights in the house, powering your fridge, almost everything is connected
    - Electronics: Encourage students to think about where their energy comes from and consider renewable options, like solar panels, for a cleaner, sustainable future

- What countries burn the most fossil fuels and who is the most impacted by these actions?
    - How are marginalized communities AND developing countries affected by those in power?

Sub-units: (Denchak, 2022)

- ★ What each of the fossil fuels are used for in today's society
- ★ Other disadvantages of using fossil fuels
    - Impacts on the environment such as land degradation and water pollution

References

Christensen. (2019). Is it Climate Change or Global Warming?: How science and a secret memo shaped the answer. CNN. *https://www.cnn.com/2019/03/02/world/global-warming-climate-change-language-scn/index.html*

Delivery to consumers - U.S. Energy Information Administration (EIA). (n.d.). *https://www.eia.gov/energyexplained/electricity/delivery-to-consumers.php*

Denchak. (2022). *Fossil fuels: The Dirty Facts*. NRDC. https://www.nrdc.org/stories/fossil-fuels-dirty-facts#sec-whatis

Fossil. (n.d.). Energy.gov. https://www.energy.gov/fossil

Fossil fuels. (n.d.). Union of Concerned Scientists. https://www.ucsusa.org/energy/fossil-fuels

Turrentine.(2022). *What are the causes of climate change?*. NRDC. https://www.nrdc.org/stories/what-are-causes-climate-change#natural

Use of Energy Explained- Energy Use in Homes. (n.d.). U.S. Energy Information Administration (EIA). https://www.eia.gov/energyexplained/use-of-energy/homes.php

What is U.S. electricity generation by energy source? (FAQs) - U.S. Energy Information Administration (EIA). (n.d.). https://www.eia.gov/tools/faqs/faq.php?id=427&t=3