Climate Change 101 Quick Facts

Climate Change Basics

- **Anthropogenic**: Refers to environmental change caused or influenced by people, either directly or indirectly[1]
- **Weather**: According to the EPA, weather is the atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season[3]
- **Climate**: According to the EPA, climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years
- **Fossil Fuels**: Non-renewable energy sources made from the carbon-rich deposits formed from buried, decomposed million-years old life-forms[5]
  - » Three types of fossil fuels: oil, coal, and gas
  - » They currently fuel about 80% of the world's energy
- **Greenhouse Effect:** As shown in Figure 1 below, the greenhouse effect occurs naturally, but when there are too many heat-trapping gases, such as carbon dioxide in the atmosphere, not enough radiation is released. This results in the Earth heating up more than it would naturally[7]

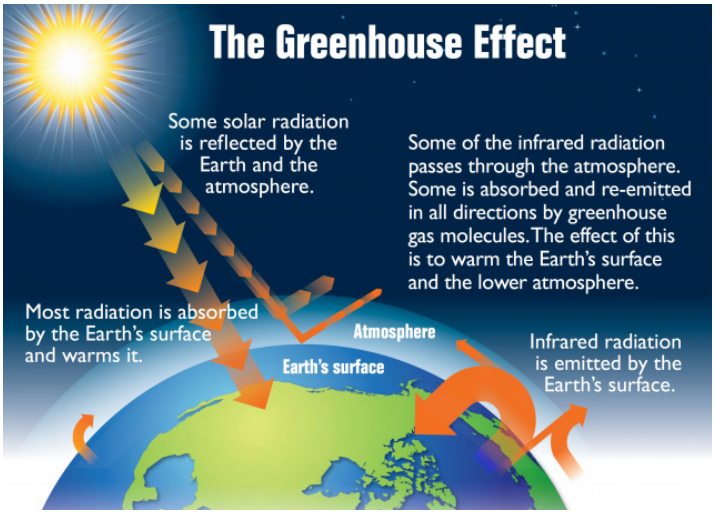

Figure 1: Greenhouse Effect Infograph
From https://www.epa.gov/climatechange-science/basics-climate-change

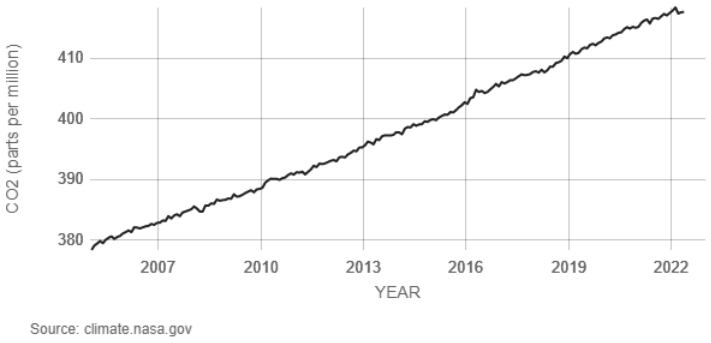

Figure 2: Monthly measurements of CO_2 from Mauna Loa Observatory
From https://climate.nasa.gov/vital-signs/carbon-dioxide/

Key Greenhouse Gases

Key greenhouse gases are emitted through both anthropogenic activities and natural causes.

- **Carbon Dioxide (CO_2):**
  - » CO_2 is considered the most significant heat trapping gas and the primary gas behind climate change
  - » CO_2 is primarily released during anthropogenic activities, like deforestation and the combustion (burning) of fossil fuels. It is also released during natural processes such as volcanic eruptions and respiration[6]
  - » Figure 2 shows the measured carbon dioxide levels during recent years at the Mauna Loa Observatory, Hawaii, with the average seasonal cycle removed
- **Methane (CH_4):**
  - » Methane is emitted through wetlands naturally
  - » It is also released by landfills, agricultural practices, the meat and dairy industries, and the extraction and transportation of fossil fuels[7]
- **Nitrous Oxide (N_20):**
  - » Nitrous oxide is mainly produced through agricultural activities and natural biological processes[7]
  - » The main sources of human-produced nitrous oxides come from the burning of fossil fuels and from industrial processes

What Causes Climate Change?

- Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer[7]
  - » This can mean longer summers, harsher winters, worse storms, and other general disruptions in normal weather and temperature for a region
- Increased greenhouse gas concentrations and escalation of the greenhouse effect are the biggest contributors to climate change. The more greenhouse gases we release, the stronger the greenhouse effect takes place — creating a cycle

Climate Change Impacts

- **Environmental Impacts**
  - » Climate change can have a wide variety of effects, and depending on where you live in the world, these effects might look different. Southern California and the Southwest United States are projected to have more intense and longer droughts and heat waves
  - » The global sea level is expected to rise between 1 to 8 feet by 2100
  - » It is predicated that the length of the frost-free winter and corresponding growing season will continue to increase, affecting food productivity[6]
  - » Animals are going extinct about 1000 times faster than they would without climate change. Climate change causes many animals to lose their habitats and food sources, leading to mass extinction[8]
- **Social Impacts**
  - » Climate change can also affect our health, ability to grow food, and access to housing and work. The most vulnerable communities are those living in small island nations, developing countries, BIPOC (Black, Indigenous, People of Color), and low-income people in the United States[2]
  - » Climate change can also directly impact human health by decreasing the quality of air and water, increasing the spread of certain diseases, and exacerbating extreme weather events
  - » Climate migration is another impact of climate change. It is expected that 143 million people from Latin America, sub-Saharan Africa, and Southeast Asia will migrate by 2050 due to climate change.[9] In the United States, 13 million near the coastline are expected to migrate[9]

What is Climate Action?

- "Climate action is any policy measure, or program that reduces greenhouse gases, builds resilience to climate change, or supports and finances those goals"[10]
- The UN introduced Goal 13 as a call for nations to address climate change through a variety of actions. You as an individual can adopt some of these goals in your everyday life. A big impact on climate change is thinking globally but responding locally[11]
- UN recommendations of actions you can take now to help fight climate change:[11]
  - » Save energy at home
  - » Walk, bike, take public transportation
  - » Eat more veggies
  - » Consider the emissions of your travels
  - » Throw away less food
  - » Reduce, reuse, repair, recycle
  - » Change your home's source of energy
  - » Switch to an electric vehicle
  - » Choose eco-friendly products
  - » Speak up

Benefits of Composting & Recycling

- When you think of recycling, what do you picture? Throwing away a bottle in the recycling bin? Well, it can be a lot more than that! Depending on local rules and your waste hauler, you can recycle materials such as car oil, cans of paint or food waste. Some of the benefits of recycling can include:
  - » Saving energy in the processing of materials for industrial and consumer use
  - » Reducing the flow of materials — especially food and other organic wastes — into landfills where anaerobic decomposition produces methane[12]
- Recycling plastic can be confusing when compared to other materials. A good rule of thumb is to recycle plastics by shape: bottles, jars, jugs, and tubs are recyclable
- Recycling aluminum can reduce 90% of the energy necessary to create new aluminum items[13]
- Composting is another good way to reduce the amount of GHG produced in landfills. Composting food waste such as veggies, fruits, and yard waste can produce a nutrient-rich soil amendment that you can use in a garden or on your house plants

Sources

1 EarthWord: Anthropogenic

2 UN Climate Action: What is Climate Change?

3 EPA Vocabulary Catalog: Weather

4 EPA Vocabulary Catalog: Climate

5 Client Earth: Fossil fuels and Climate Change: The Facts

6 NASA Vital Signs: Carbon Dioxide

7 EPA Basics of Climate Change

8 The Climate Inititative: Species Extinction

9 The Climate Inititative: Climate Migration

10 Action LAC: Climate Action

11 UN Sustainable Devlopment Goals

12 North Carolina Environmental Qualilty: Recycling and Climate Change

13 University of Colorado Boulder: Recycling and Climate Change