

# What is Climate Change?

**Climate Change** - is the long-term shift in worldwide weather driven by a global increase in average temperatures.

## What is the Difference Between Weather and Climate?

**Weather** refers to short-term changes in the atmosphere.

**Weather** is what we experience today.



*Weather is what you are wearing today*

*Climate is what is in your wardrobe*



**Climate** describes what the weather is like over a long period of time in a specific area.

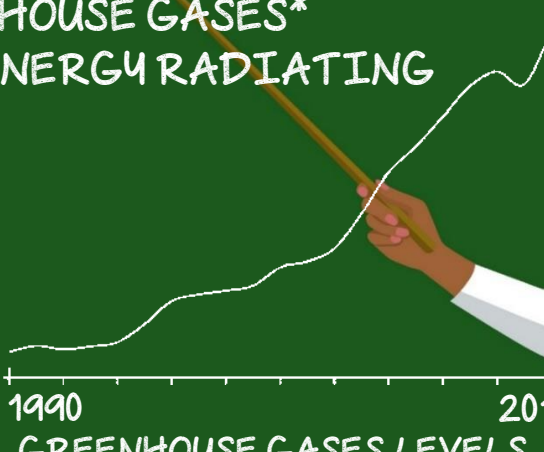
**Climate** is the likelihood of the weather we'll have.

## What is Causing Climate Change?

THE CLIMATE CHANGE WE FACE TODAY IS CAUSED BY THE **GREENHOUSE EFFECT** - WARMING FROM GREENHOUSE GASES\* TRAPPING INFRARED ENERGY RADIATING FROM EARTH.

\*GREENHOUSE GASES HAVE BEEN INCREASING IN OUR ATMOSPHERE SINCE THE INDUSTRIAL REVOLUTION.

1990 2010  
GREENHOUSE GASES LEVELS.



## Earth's Infrared Energy

When sunlight strikes the Earth, it warms the surface and becomes heat energy – or **infrared energy**. This infrared energy then radiates back towards space.



## The Greenhouse Effect

Our atmosphere is made up of both **Non-Greenhouse** and **Greenhouse Gases** gasses.

**Non-Greenhouse Gases** do not react to visible light, nor infrared light. That means both sunlight and infrared energy pass through them unaffected, allowing Earth's heat energy to radiate into space.

**Greenhouse Gases** also do not react to visible light, however, they **DO** react to infrared energy, trapping Earth's heat energy and reflecting it back, warming the Earth.

Global Levels of **Greenhouse Gas:** in Parts Per Million (ppm)

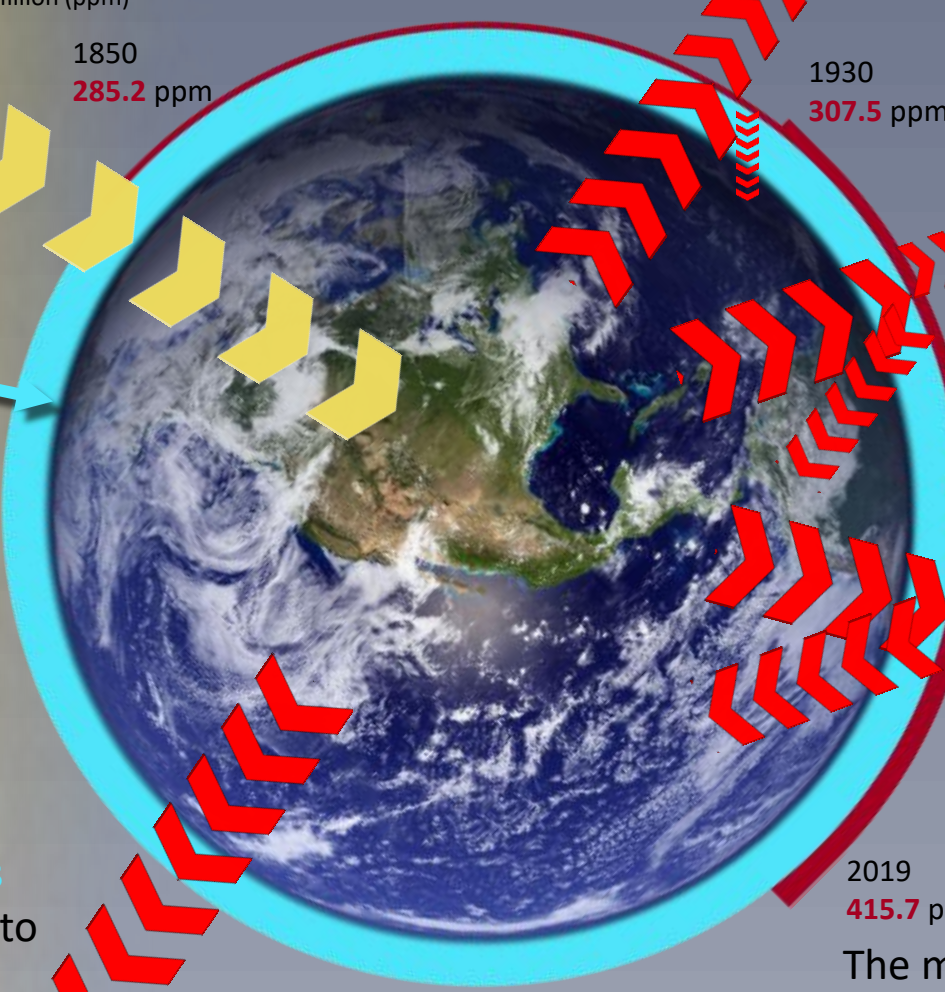
1850 285.2 ppm

1930 307.5 ppm

**Greenhouse Gases** trap Earth's heat energy and reflecting it back, warming the Earth.

- Non-Greenhouse Gases**
- Nitrogen (N<sub>2</sub>)
- Oxygen (O<sub>2</sub>)
- Argon (Ar)

**Non-Greenhouse Gases** allow Earth's heat energy to radiate into space



- Greenhouse Gases**
- CO<sub>2</sub> Carbon Dioxide
- CH<sub>4</sub> Methane
- N<sub>2</sub>O Nitrous Oxide
- H<sub>2</sub>O Water Vapor

1975 331.4 ppm

2019 415.7 ppm

The more **Greenhouse Gases** in our atmosphere, the more global warming we experience.

## Earth is Not Alone With The Greenhouse Effect

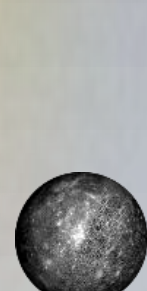
We can see the **Greenhouse Effect** at work throughout our solar system:

Mercury +333° F

Venus +867° F

Earth +59° F

Mars -85° F



Venus's atmosphere is over 96% Greenhouse Gas and its average surface temperature is 867° F.

The **Moon**, with no Greenhouse atmosphere, has an average surface temperature of 0° F.

That's three times hotter than **Mercury**... which is half its distance to the sun.

**Earth**, with its Greenhouse Gas atmosphere, has an average temperature of 59° F

## Where Do Greenhouse Gases Come From?



Transportation 29%



Electricity 28%



Industry 22%



Buildings 11%



Agriculture 9%



References:  
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