What Is Global Warming?

Global warming and are terms we often use interchangeably. But they're actually *not* the same thing. So, what is global warming? And should we say "global warming" or "climate change" when discussing the need for sustainability?

While this topic can seem confusing, the difference between climate change and global warming is simple. We're here to help you get a better understanding between the two in order to be the best planet champion you can be.

First, let's establish some definitions. Climate change is a shift in usual weather patterns. Weather is temporary (as in, today it's raining), but climate is (usually) fixed. When the typical weather patterns start changing—such as more extreme rain, heatwaves, and out-of-the-ordinary winter storms—the entire climate is changing.

Climate change *can* happen naturally. Think of the Ice Age. However, today's climate change is the result of global warming. Global warming is the long-term heating of the Earth's climate system. Starting in the Industrial Period (which is when large-scale fossil fuel burning began), the Earth's average global temperature has increased by 1 degree Celsius (1.8 degrees Fahrenheit).

For all of human existence, we've stayed within this range. Now, not only have we surpassed the maximum of this range, but the Earth's temperature is now increasing by 0.2 degrees Celsius per decade. Based on current and historic trends, scientists estimate that an increase to 2 degrees Celsius could change life as we know it. The IPCC climate report estimates we will reach this threshold in 20 to 30 years if we don't make serious changes.

Global warming is driving climate change because the heating of the Earth is disrupting weather patterns. But the question still stands: should we talk about global warming or climate change?

Today, it's more acceptable to refer to them interchangeably. In the past, there has been controversy over the terms because people believed the Earth couldn't be warming if winters were getting colder. However, colder winters are another product of climate change. Large-scale weather patterns are creating more extreme weather in *all* seasons.

So, climate change is a product of global warming. Considering the extraordinary heatwaves occurring around the world, more people are recognizing that global warming and climate change go hand-in-hand.

Still, a general rule of thumb: If you're talking about changing weather patterns, it's climate change. If you're talking about rising temperatures, it's global warming. But what actually *causes* global warming?

Why Is the Earth Warming?

Global warming, and subsequent climate change, started in the late 1800s. Not-so-coincidentally, this was the start of the Industrial Revolution. Burning fossil fuels releases copious amounts of carbon dioxide into the atmosphere. These emissions have heat-trapping abilities.
As the CO2 collects in our atmosphere, it's more difficult for heat to escape Earth. That's why CO2 emissions are called greenhouse gases: They trap the heat in the atmosphere, warming the planet, just like greenhouses keep your plants warm in the winter.

However, trapping heat on Earth does more than just keep us warm. Our climate is dependent on a careful combination of the right temperatures, ocean currents, and atmospheric trends, so changing the temperature disrupts this balance.

How Is Global Warming Impacting the Planet?

We now know global warming causes climate change, which causes extreme weather and other associated consequences. However, global warming also has direct effects. What does that mean? Will it just get really hot?

Let's clarify what global warming is doing to the planet. It's important to remember: These effects may be relatively immediate or could take decades to fully manifest. This means we have time to stop these harmful changes from happening.

1. Rising Sea Level

Rising sea levels were the first obvious effect of global warming. As the Earth warms, the ice sheets melt. As the thawed water empties into our oceans, the ocean's volume increases, and sea levels rise.

Since 1880, the global mean sea level has risen about 8 to 9 inches, and about a third of that occurred in the last 25 years. That number will also continue to increase. By 2100, sea levels may increase approximately 3 feet—some of which will be caused by runoff from melting ice in Greenland and West Antarctica.
Not only does a rising sea level put coastal regions at risk, but elevated sea levels also make tropical storms and hurricanes more severe, as seen with Hurricane Sandy in 2012.

2. Dangerous Heat and Humidity

As temperatures rise, cities across the world experience heatwaves that cripple infrastructure and put many at risk. The "wet-bulb temperature" is a critical number for quantifying the risk of heatwaves.

Wet-bulb temperature is the lowest temperature a damp surface can have. Once the temperature rises, the surface will start to evaporate and dry. Humidity increases this temperature, meaning a surface doesn't evaporate as easily when it's more humid.

When the wet-bulb temperature exceeds about 95 degrees Fahrenheit, the human body cannot exchange heat with the environment fast enough to cool down, leading to dangerous overheating.

3. Drought and Food Scarcity

Perhaps the most detrimental and immediate effect of global warming will be its impact on food and water. Scientists have found that global warming will lead to fewer but stronger storms. This means flash flooding could be a problem in some regions, potentially threatening clean water supplies.
At the same time, warmer temperatures will increase the likelihood of what scientists call "megadroughts," which can deplete water supplies and impact farming. Scientists have estimated that rare agricultural losses (i.e. famine) could become more regular, especially in regions where food and water scarcity are already more common.

How to Address Global Warming

Even though floods, heatwaves, and megadroughts are all scary prospects, climate change can be slowed and, to an extent, stopped.

Burning fossil fuels predominantly causes global warming; therefore, we must reduce greenhouse gas emissions. According to the scientists behind the IPCC report, we can significantly limit global warming with "strong and sustained reductions in emissions of carbon dioxide (CO2) and other greenhouse gases."

Immediate and comprehensive action to reduce CO_2 emissions would mitigate the worst effects of climate change.
Big companies need to make changes in order to lower their carbon footprint. Many have already gone carbon neutral (like Google) or are pledging to by 2050 or sooner. We can also address our own carbon footprints. After all, reducing carbon dioxide emissions requires large-scale change.

Where can you make your carbon footprint smaller? Here are some recommendations.

1. Create an Energy-Efficient Home

Our homes use a lot of energy. From electrical appliances to water heating to lighting, most of our daily comforts run on fossil fuels. Switching to renewable energy is ideal (and becoming cheaper across the world), but this isn't accessible to everyone—especially for those who don't own their homes. Fortunately, there are some very simple actions you can take to reduce your daily footprint, which adds up over time.
Compact fluorescent light (CFL) or light-emitting diode (LED) bulbs use 75% less energy than regular bulbs. If 20 million light bulbs are changed to CFLs, it would cut down greenhouse gas emissions equal to that of more than 150,000 cars each year. And don't forget to turn off the lights when you're not in a room and unplug unused appliances (like your phone charger or toaster). These actions may seem small, but they can save a lot of energy over time.
Additionally, your home's energy consumption mostly comes from heating and cooling. By turning your thermostat to 68 degrees Fahrenheit in winter and 78 degrees Fahrenheit in summer, you can save 10 to 15% on your energy bill and 2,000 pounds of carbon dioxide annually.

2. Take a Walk (or a Bike or Bus)

According to a 2017 study, one action people can take to mitigate climate change is living car-free. Almost one-fourth of an individual's emissions come from driving. While going 100% car-free isn't realistic for everyone, reducing how often you drive can still cut your emissions down significantly.
Consider taking public transportation, carpooling, or asking your job if you can work from home occasionally. If the distance is short and the weather is nice, walk or bike to your destination. Leaving your car at home just two days a week can save up to two tons of greenhouse gases a year.

3. Plant a Tree

Other than burning fossil fuels, destroying carbon sinks (like trees) is one of the most detrimental human behaviors causing global warming. Trees absorb carbon dioxide, which reduces greenhouse gases in the atmosphere. Without carbon sinks, carbon collects in the atmosphere, trapping heat on Earth.

The U.S. Department of Energy reports planting three shade trees can save homes hundreds in energy costs annually. This saves you money and makes your home more energy-efficient.

4. Reduce Your Meat Consumption

The cattle industry creates a surprising amount of carbon emissions. In fact, the aforementioned 2017 study found a plant-based diet is one of the top ways individuals can help mitigate climate change.
However, you don't have to be 100% vegetarian or vegan to make a difference. By cutting your consumption of animal protein in half, you can reduce your diet's carbon footprint by more than 40%.

5. Exercise Your Right as a Citizen and Consumer

This is arguably the most important action item on the list. According to the recent IPCC report, limiting climate change will require large-scale changes from governments and corporations. Only 100 companies create 71% of carbon emissions.
IPCC scientists urge individuals to put pressure on their governments and on companies to implement necessary changes. This can manifest in myriad ways: voting for climate-friendly legislation, contacting your representatives about climate change, boycotting high-polluting companies, voting with your dollar, and joining or supporting environmentalist organizations.

However you feel most comfortable using your voice, call for change on a societal level.

The Takeaway

Global warming is a serious (and sometimes scary) concept. But it's important to remember that we can stop it. It's caused by human activity, so it can be stopped by human activity. By focusing on strategies to reduce your (and your community's) carbon footprint, you can be part of the solution.

There is no one-size-fits-all solution to global warming. Everyone's carbon footprint is caused by different activities, so everyone will need to take different actions to reduce it. While it's impossible to have *no* carbon footprint, we can do is our best to make it smaller.