

# What is climate change?

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WHILE you are reading this, you are probably in a room powered by electricity. You might be reading this on a piece of paper, and you read it by the light of a lamp. You might be reading this from the screen of a computer. Either way, you are reading this thanks to electricity entering your home or office probably from the power grid.

Depending where you are, the energy that powers your devices probably comes from the burning of fossil fuels like coal, oil, and natural gas. According to a 2013 statistics, around 73 percent of the energy produced in the Philippines comes from fossil fuels.

The modern, industrial world we live in was built using energy from burning fossil fuels. From the clothes we wear to the electronic gadgets we use, many of the things surrounding us were made using fossil fuel energy. Even most of the ways we go from one place to another, from buses to airplanes, burn fossil fuels to do their work.

When fossil fuels are burned, they release heat, carbon dioxide, and other materials. In power plants, this heat is converted to electricity, which is then fed to the grid to power our homes and businesses. The carbon dioxide and other materials, meanwhile, get released into the atmosphere.

Carbon dioxide is a natural component of air. It is transparent and allows sunlight to pass through. However, when solar radiation bounces off the Earth's surface, carbon dioxide can trap this reflected energy and keep it in the atmosphere as heat. Because of this ability to trap heat, carbon dioxide is called a greenhouse gas (GHG). Methane is another example of a GHG.

Without GHGs in the atmosphere, all of the sunlight bouncing off the Earth's surface would go out into space. GHGs keep our planet warm and livable.

However, the burning of fossil fuels that people have been doing since the Industrial Revolution has caused the amount of carbon dioxide in the atmosphere to increase. This increase in carbon dioxide has led to more heat becoming trapped in the atmosphere. As a result, the Earth is warming up, a phenomenon known as global warming.

But global warming does not mean that all parts of the Earth will experience a rise in temperature. It simply means that the average temperature of the Earth over an entire year is increasing.

The increase might seem slight. Compared to temperatures before the Industrial Revolution, the average global temperature of 2016 is higher by almost 1 degree Celsius. We experience changes in temperature far greater than this in the span of a year. Temperatures in Manila, for example, can range from 22 degrees during some nights in January to 37 degrees during some days in April.

An increase of almost 1 degree in the average temperature of the entire planet should not be compared to the rise and fall of temperature due to weather and seasonal changes. Even a slight increase in the average global temperature leads to a major disruption of the systems that make Earth livable for people and many other forms of life. The average global temperature during the last ice age was only 5 degrees lower than today's. And yet the world was a very different place back then.

The disruption in the Earth's delicate balances because of global warming is what we call climate change. While the Earth's climate has changed many times in the past, there is plenty of evidence that the present climate is changing really rapidly, and the cause of this change is human activity, especially the burning of fossil fuels.

This is where the arc of this story bends back to you and your possible descendants.

Because of the warming of the Earth's surface, there's more heat energy stored in the oceans. The world's oceans then release this energy in the form of typhoons and monsoons.

More energy means stronger and more frequent typhoons. More energy also means heavier rainfall during monsoon season. The effect: more super typhoons and freak monsoons headed our way. But also, they'll be less predictable. They're not the typhoons and monsoons we're used to for thousands of years. They're the manifestation of a new climate.

The changing climate also brings about radical changes in the pattern of rainfall. Rains might now arrive too early, too late, or not at all. When they arrive, they might be too much of it, or too little. Farmers, fisherfolk, crops, and wildlife are all caught off guard.

We've barely scratched the surface of the impact of climate change. In succeeding articles, I will write in greater detail about those impacts, how it affects you directly, and what we can do as ordinary people to adapt to climate change and possibly mitigate some of its most extreme effects.

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