Good-Media Academy Scrips

1.2\_Climate Fundamentals

We are currently facing the greatest threat our species has ever faced: the climate crisis. For a long time, climate change was something that scientists were predicting would happen in the future, but that is no longer the case. Our climate is now changing faster than anyone imagined would be possible, and at the current rate of warming, we risk a devastating future.

So what do we mean when we say climate change? Our planet's temperature changes all the time, and it is completely natural, as has been the case since the Earth was formed 4.5 billion years ago. However, things are now changing too fast. Since the Industrial Revolution in the 1800s, global temperature has increased much faster than it ever has before, so much so that 20 of the warmest years on record have happened in the last 22 years. Our planet has an incredible ability to adapt to changes, but now our planet is changing too fast, and we cannot adapt quickly enough.

Remember when the weather used to be that boring update at the end of the news? Well, now it is the news headline. Every single day our planet experiences extreme weather events that are having catastrophic effects worldwide. When scientists first discovered this warming trend, no one could be sure what was causing it. But four decades of research later, the evidence is unequivocal. This warming trend cannot be explained by natural factors. It is no coincidence that these two graphs follow the same pattern. Humans have caused this uncontrollable temperature increase through our use of fossil fuels.

From the moment you wake up and check your phone to the moment you go to bed and plug it into charge, we are continuously drawing energy. Fossil fuels like oil and gas are finite resources formed on our planet, and burning them releases greenhouse gases, also referred to as GHGs. This describes a collection of gases that live in our atmosphere and keep us at a stable temperature for life as we know it. GHGs are a normal part of our planet's chemistry. They effectively form a blanket around the planet to stop heat escaping. Without this blanket, the Earth would be on average 30 degrees colder—basically like the Moon—and this is what is called the natural greenhouse effect.

So, what is the problem? Well, the problem is we are generating too much of it, and our planet's blanket is getting too thick. Essentially, the more greenhouse gases in our atmosphere, the less heat can escape and the hotter our planet gets, displacing our natural process and damaging our environment. There are many different kinds of GHGs in our atmosphere. Even water vapor is a greenhouse gas, but the two that get the most attention are methane (CH4) and carbon dioxide (CO2). CO2 is the most abundant greenhouse gas on our planet and has contributed more to climate change than any other greenhouse gas, putting us at the greatest risk of irreversible change.

Once CO2 is emitted into the atmosphere, 40% of it will remain for the next 100 years, 20% will remain for the next 1,000 years, and the final 10% will take 10,000 years to fully dissipate. So, carbon being emitted today will be around for another 10,000 years. Before we started to burn fossil fuels, the amount of CO2 in our atmosphere was around 280 parts per million. It's now over 400 parts per million, and it is continually increasing.

But what about CO2e? Often, we pop that little 'e' on the end, and it's super important. Most carbon estimators will produce results with a CO2e figure, and this stands for carbon dioxide equivalent. It represents all the greenhouse gases into one figure, and it's achieved by calculating the amount of warming a gas would create relative to one ton of carbon dioxide over a 100-year time scale. So, basically, that 'e' means that we haven't forgotten about all the other greenhouse gases.

Okay, let's talk about warming and degrees of warming. The first thing to know is that the planet has already warmed up. From pre-industrial times, before we started burning fossil fuels in the 1800s, we have already heated up the planet by around 1 degree Celsius. You've likely heard the numbers 1.5 and 2 degrees associated with global warming and climate change. These two numbers outline the average global increase that we are striving for, and these two numbers became important in 2015 at the United Nations Climate Summit in Paris, where, for the first time ever, almost every country in the world came to an agreement to slow down climate change.

1.5 degrees is the most ambitious and stringent target. To limit global warming to just 1.5 degrees hotter would significantly reduce the risks and impacts of climate change, particularly for vulnerable ecosystems and vulnerable communities. Achieving this goal would require aggressive efforts to reduce greenhouse gas emissions, transitioning to renewable energy sources, and implementing various climate mitigation and adaption measures.

2 degrees of warming from pre-industrial levels was the initial target set in the Paris Agreement, aiming to prevent catastrophic climate change. A 2-degree increase is associated with substantial impacts, such as severe heatwaves, extreme weather events, rising sea levels, and disruptions to ecosystems and biodiversity. The Intergovernmental Panel on Climate Change (IPCC) has provided scientific assessments highlighting the difference in impact between 1.5 degrees of warming and 2 degrees of warming.

Efforts to limit global warming involve a combination of mitigation (reducing emissions) and adaptation (adjusting to the changes now already occurring), which is a huge challenge as it will involve contribution from every part of our economy. 2 degrees hotter than pre-industrial levels doesn't sound like much, but we're already 1 degree warmer and we are seeing impacts from that around the world.

Earth's ice, frozen for millennia, is now melting. Antarctica is losing 151 billion tons of ice every year. That's the equivalent in weight to the rock that makes Mount Everest. The Greenland ice sheet is losing five times as much ice today as it was 25 years ago. This melting ice has only one place to go: the ocean. Sea levels have risen by 20 centimeters in the last 100 years. Some models predict up to a meter rise by the end of the century. The homes of 200 million people will be below sea level in 70 years. 200 million people in the world—more than three times the UK population—will live below the tideline by the end of this century if sea levels continue to rise. That could lead to potentially overwhelming numbers of climate refugees.

These effects are having a very uneven distribution across the world. In the United States, Louisiana is on the front line of the climate crisis. It's losing land at one of the fastest rates on the planet, about the rate of one football field every 45 minutes. We've seen a tripling in the extent of wildfires in the western United States. 8% of all species are currently under threat of extinction due to climate change. Species exist in interconnected webs, so the loss of just the smallest organism can destabilize and ultimately collapse entire ecosystems.

And that's all just from one degree of warming. Imagine what two degrees of warming could do. As these temperatures rise, the threats we face multiply.