

GH101: Second Place

More Than Just Global Warming: Why We Need to Put a Stop to Carbon Dioxide Emissions

By Ian Stearns

Audience Analysis: The purpose of this paper is to convince its readers that significant efforts should be made to reduce carbon dioxide emissions. It is written for an audience of Americans who are aware of the ongoing debate regarding carbon emissions and global warming but who may not know the various other effects carbon dioxide can have on the world around them. I appeal specifically to an audience of young to middle age voters so that I can effectively appeal to their value of preserving the Earth; these are the people who will have to live with the effects of carbon dioxide emissions and should therefore care the most about stopping them.

Ever since the dawn of the industrial age, humans have been spewing toxins and chemicals into the air around them. It seems as if each technological step forward has brought with it a new environmental consequence to rectify. However, the worst of these consequences has yet to come. Carbon dioxide, a chemical that has been continuously emitted since the 19th century, has the potential to cause terrible, irreversible changes to the Earth. For one, carbon dioxide emissions are correlated with rising global temperatures, a process that will disrupt many facets of human life. While this is by far the most well-known aspect of carbon emissions, it is certainly not its only consequence. In addition to global warming, carbon concentrations are also linked to the acidification of lakes and rivers around the world as well as decreased cognitive abilities in humans. Despite its potential for disaster, however, carbon dioxide has historically not been regarded by the public as a very pressing issue. This is a mindset that needs to be changed immediately, as most professionals agree that if efforts are not made to change the course of carbon emissions soon, its terrible effects may become irreversible. Given all of the negative impacts of increasing carbon concentrations in the atmosphere and the time-sensitivity of the issue, it is imperative that efforts be taken now to reduce carbon dioxide emissions.

The most well-known and potentially most dangerous consequence of carbon emissions is its contribution to the changing of Earth's climate. Carbon dioxide is a greenhouse gas, a type of gas which is defined by its ability to "affect the transfer of infrared energy through the atmosphere" ("Is Climate Change Real" 11). Essentially, its presence in the atmosphere can cause heat to be more readily absorbed, warming the Earth as a result. Although this may seem like an abstract process, this exact phenomenon has been predicted by numerous climatological models (Williams 1). In fact, even despite the varying ways these models can project how the atmosphere will react to an increase in carbon dioxide, it has been consistently shown that

“surface warming increases nearly linearly with the cumulative CO₂ emitted” (Williams 1).

Given that a suite of different models all predict the same increase in global temperatures, it is undeniable that increasing carbon emissions is a major cause of global warming.

The consequences of a warming Earth will be disastrous if they ever come to fruition. The Earth has warmed 0.9°C since the 19th century, and while that may not seem like a lot, if warming continues at this rate, there will be unprecedented changes to our environment (“Is Climate Change Real” 11). For one, increasing temperatures result in the melting of polar ice caps and glaciers. This obviously has a terrible effect on the ecosystems of both the Arctic and Antarctic, the disruption of which will cause trickle-down effects for all marine ecosystems. However, more daunting for humans is the rise in sea level associated with this melt. Sea levels have risen 8 inches in the last century, and that rate is only increasing (“Is Climate Change Real” 11). This continuous rise in sea levels will inundate coastal regions all around the world, displacing potentially billions of people. Additionally, increasing global temperatures are linked to an increase in extreme weather events, including severe storms, rainfall, and temperature extremes (“Is Climate Change Real” 11). These are all just a small set of the many real, tangible effects of a warming globe. Furthermore, it should be made clear that these impacts are not just events that will happen in the far future; we are already observing these changes in the present day. Sea levels are observed to be rising right now, and global ice sheets have already lost a mass of 286 billion tons since 1983 (“Is Climate Change Real” 11). These consequences of global warming are demonstrably terrible, and are directly associated with carbon emissions. They alone should be enough to incentivize a push toward reducing carbon dioxide emissions.

Of course, these motives have not been enough to inspire a push to eliminate carbon emissions. The rather unfortunate reason for this is that many believe that the evidence

supporting anthropogenic climate change is insufficient, or in some way flawed. A common perception regarding the field of climate science is that, while there may be merit to some of its findings, “the most crucial information is the least reliable” (Schiermeier 284). Indeed, regarding whether or not global warming is a result of human activity, there is controversy surrounding the method climate scientists use to gather ancient temperature data called tree ring proxying (Schiermeier 286). On the surface, allegations like this seem to call into question the validity of the conclusion that climate change is a result of human activity. However, a massive flaw with these arguments against climatologists is that they are usually based on small statistical flaws that are exaggerated to make generalizations about the whole field. With regards to the tree ring proxies, even Quirin Schiermeier, a reasonably renowned climate skeptic, concedes that “the tree ring divergence problem is restricted to a few high-latitude regions in the Northern Hemisphere and is not ubiquitous even there” (287). Using these minor discrepancies to make broad assumptions about the field is dangerous, as it gives the impression that climate science data cannot be trusted, when in fact the data is perfectly sound. Ultimately, almost all of academia agrees that there is a “greater than 95 percent probability” that climate change is primarily caused by humans (“Is Climate Change Real” 11). But since most of the rhetoric regarding climate change and CO₂ is not focused on academia, many of these flawed perspectives about anthropogenic global warming still persist in the public consciousness. However, even if all of this evidence is not enough to convince you that global warming is human-caused, there are still many other compelling reasons to strive to reduce carbon dioxide emissions.

One of these many reasons to reduce CO₂ emissions is that it can lead to the acidification of lakes and rivers across the world. The process behind this acidification is a simple one: as carbon dioxide levels go up, large bodies of water will intake a portion of this excess carbon,

resulting in the formation of carbonic acid, lowering the pH of the water (Pearce 1). This process has already been observed in the world's oceans for many years. However, recent research has concluded that the absorption of carbon into freshwater bodies, like lakes and rivers, happens “really quite fast—three times faster than in the world's oceans” (Pearce 1). While ocean acidification was already a really bad thing, that the problem now also encompasses freshwater bodies makes it an even bigger deal as the consequences of water acidification will now be felt more acutely, and quickly, in areas away from the world's oceans. Decreasing the pH of the water will destroy numerous marine ecosystems as many species will simply not be able to adapt to the newly acidic water. Additionally, human drinking water will be heavily affected; you would not want a buildup of acid in your drinking water for the same reason you would not want to put vinegar in it. The potential consequences of acidifying water bodies are vast and devastating, and are directly caused by increasing carbon dioxide concentrations.

Another even more compelling reason to reduce CO₂ emissions is that increased carbon concentrations are directly linked to decreased cognitive abilities in humans. Simply put, carbon dioxide is poisonous to humans, and being exposed to it in any capacity puts our health at risk. To demonstrate this, Russian psychophysicologist D. I. Sidorin performed a study in which school children were instructed to perform cognitive tasks in an environment with high carbon concentrations. His studies show that there is a “significant reduction” in student attentiveness when carbon concentrations reach a level above 2000 parts per million (871). These results are quite alarming, as it suggests that the ability for humans to think coherently, humanity's most valuable asset, is reduced when carbon concentrations increase. It should be noted that 2000 ppm is not very high; it only took a few hours of normal breathing for the carbon dioxide levels to reach that amount in the classroom (871). The global average only creeps closer to this mark

every day we continue to spew carbon dioxide into the atmosphere. This is an unambiguously abhorrent side effect of carbon dioxide emissions and should be a major motivation for everyone to rally against the emission of carbon into our air.

In addition to all of these terrible consequences of carbon dioxide emissions, it is important to understand that this is a time-sensitive issue; if nothing is done to curb the effects of carbon emissions, we will feel the consequences of our inaction within our lifetimes, and by then, it may be too late to reverse them in any meaningful way. The key, however, is that there *is* still time to take action. The process of reducing our carbon emissions will be a long and difficult one, but it should be clear that it is a process one hundred percent worth undergoing. To be okay with complacency regarding carbon dioxide also means being okay with global warming and the myriad of ecosystems and human lives it will inevitably destroy. And even if the overwhelming evidence supporting anthropogenic climate change is not enough to convince you it is human caused, the other formidable impacts of carbon dioxide should still be more than enough to inspire a push towards its reduction. To not do so will mean the acidification of human drinking water, the disruption of nearly all marine ecosystems, and a worldwide reduction in the ability of humans to think. It should be obvious which path we need to follow regarding the emission of CO₂. The question is: will we take it in time?

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