

Climate Change Research Paper

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MECH-420-01

Spring 2022

Amongst many of the world's issues, climate change is the one that more people should be concerned about. The main reason for this is due to the fact that humans have nowhere else to go once the planet is destroyed by our hand. Many different popular and powerful organizations have started to collaborate with each other to help stop this crisis. In order to properly stop something, one must first know what causes it, along with how bad it actually is.

In order to properly realize the climate change crisis is happening, it is overwhelmingly important to look at the evidence that is produced by reliable sources. A very well credited and reliable source, such as NASA, has vast amounts of evidence proving that this situation is even worse than most people even know. Another very well known source would be that of the United Nations, however they are more oriented towards a plan to fix and change it, they still have some evidence to prove that it is happening. Starting with NASA, the facts are overwhelming, they state several different types of evidence, such as the global temperatures rising, the warming of the oceans, shrinking ice sheets, glacial retreat, decreased snow cover, sea level rise, the declining of the Arctic Sea's ice, extreme weather events, and oceanic acidification (NASA). On top of the listed items, NASA also has several satellites that are extremely advanced and collect various data relating to greenhouse gasses, surface temperatures, and various other quantifiable changes. To elaborate more on some of these points, starting with the global temperature rising, NASA has collected data that states "The planet's average surface temperature has risen about 2 degrees Fahrenheit (1 degree Celsius) since the late 19th century, a change driven largely by increased carbon dioxide emissions into the atmosphere and other human activities. Most of the warming occurred in the past 40 years, with the seven most recent years being the warmest. The years 2016 and 2020 are tied for the warmest year on record" (NASA). Using the previously mentioned satellites, NASA was able to calculate the averages of the surface temperatures based on years before today starting from the year 2020 and going all the way back to 1880. The main reason for the year being 1880 is due to that year being the first year that a modern version of temperature logging started. After they were able to calculate the averages over time, they were able to then create a visualized rendering of the warming based on year. Moving into the warming of the ocean's part of the evidence, NASA states "The ocean has absorbed much of this increased heat, with the top 100 meters (about 328 feet) of ocean showing warming of more than 0.6 degrees Fahrenheit (0.33 degrees Celsius) since 1969. Earth stores 90% of the extra energy in the ocean" (NASA). This evidence is the main supporting reason that some of the coral reefs in the shallower parts of the ocean are dying. This is largely due to the fact that the life that is within the reefs are unable to handle the temperature difference and cannot adapt and end up tragically dying. The shrinking ice

sheets that NASA mentions involve decreasing in mass. “Data from NASA’s Gravity Recovery and Climate Experiment show Greenland lost an average 279 billion tons of ice per year between 1993 and 2019, while Antarctica lost about 148 billion tons of ice per year” (NASA). The previously stated numbers are gigantic in the grand scheme of things. Especially considering that the scale of it is per year and the measured ice is in that of tons. Doing some quick calculations, the amount of ice in Greenland, based on averages, lost per second in pounds is 17,694,063, which is equivalent to 1,539 average male grown elephants. These pieces of evidence definitely help prove that the effects of climate change are not good in terms of the grand scheme of things.

Shifting gears to look at the several different potential methods to fix this widespread issue, there are plans that are in place from major corporations and organizations. Starting with the United Nations plans, they have a couple that have been stated both recently and a while ago. The first major plan was called the Kyoto Protocol, this plan was proposed in 1995 and it involved “legally [binding] developed country parties to emission reduction targets. The Kyoto Protocol’s first commitment period started in 2008 and ended in 2012. The second commitment period began on 1 January 2013 and ended in 2020. There are now 197 Parties to the Convention and 192 Parties to the Kyoto Protocol” (UN). The main goal of this protocol is to become stricter on emissions, most specifically, Carbon Dioxide, Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons, and Sulphur hexafluoride. This is done by having a specific assigned amount for each of the gasses. Switching back to NASA, they have an entire list involving sustainability objectives. This list includes, “increase the use of renewable energy, eliminate waste, prevent pollution, increase proper use of recycling” and many others (NASA). The most basic of these solutions would be to lessen the amount of pollution. This also goes hand in hand with the recycling and the waste points that were made within the list. If the amount of objects are recycled properly in conjunction with the lessening of the amount of trash that is on the street or in the oceans then the pollution will get better in terms of less emissions and less of this waste getting everywhere and ruining the environment. My fellow engineering student and I both agree that the mass production of Electric Vehicles will only end up hurting the environment more in the long term. This is due to the lack of recyclability of the battery packs after they are no longer usable. Not only that, the mining that goes into making said battery packs is harmful to the earth. We think, instead of focusing on the electric vehicle market, more research should be done in hybrids, or better yet, Fuel Cell vehicles. The main reason for this is that fuel cell vehicles do not produce any waste that would be harmful to the environment. The main exhaust is none other than water, and that is not bad at all for the

environment. Not only that, the primary fuel source is pressurized Hydrogen, which occurs naturally. In the future, it would be smart for the fuel cell companies to use electrolysis to reuse the hydrogen from the water that is exhausted. All in all, the main focus of helping the climate change crisis would be to listen to the UN about the emissions, along with the plans stated that NASA is going to take, with the Fuel Cell proposal we have laid out, this disaster should improve over time.

In conclusion, climate change is something that impacts a lot about our daily lives. Looking at the overall history of climate change, more recently these issues have become more relevant. That is why it's important for people to realize their direct impact on the environment. With the way society is run today, there is a lot of opportunity for people to become connected to the environment in an indirect way (if not disconnected from the environment entirely). With all of this considered, it is important to take seriously some of the guidelines organizations like the UN have laid out for global pollution levels. More directly, it is important for the future generations of engineers (just like us) to do what we can, such as focusing on more environmentally friendly technologies (fuel cells) to make our social environment more respectful of our natural environment.

References

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