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### Global Warming And Its Consequences

In this paper, I will describe what global warming is and prove that it exists and is caused by human activity and Carbon Dioxide output. I will do this by first explaining what the scientific community believes as stated by the Intergovernmental Panel on Climate Change (IPCC) and how this organization analyzed the data to get their results. Secondly, I will explain the major criticisms against global warming, namely that the climate is always changing, the sun causes global warming, global warming isn't bad enough to concern us, and there is no scientific consensus that it is actually happening. Thirdly, I will rebuttal these major criticisms by explaining the flaws in each specific argument.

Global warming is the belief that there is a gradual increase in Earth's temperature. It is generally attributed to human activity and the greenhouse effect cause by an increased level of Carbon Dioxide and other pollutants. Because of the potential concerns this provokes, the government established an organization whose purpose was to provide objective, unbiased, and expert science on the topic of climate change, and to explore the socio-economic implications. (Paliewicz). This organization was called the Intergovernmental Panel on Climate Change (IPCC). The IPCC published the *Fourth Assessment Report* (AR4) in 2007. This report stated explicitly, "Global GHG (Greenhouse Gas) emissions due to human activities have grown since preindustrial times, with an increase of 70% between 1970 and 2004." It also stated, "Global atmospheric

concentrations of [carbon dioxide], methane, and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed preindustrial values determined from ice cores spanning many thousands of years.”(IPCC Fourth Assessment Report) Both of these quotes make it clear that global warming is an issue and that it is caused by human activities and greenhouse gas emissions. But how bad is it actually? The IPCC report continues on to state that if the climate rises 3°C or more, any further mitigation efforts would be futile because climate damage will be irreparable. (Paliewicz)

However even with this scientific data and conclusions, some people still do not believe in global warming. In fact, as of March 2012, 37% of Americans believe that global warming is not caused by human activity. (Americans’ Global Warming Beliefs) There are four major arguments against climate change:

1. The climate has changed before. This is nothing different.
2. The Sun is causing the increase in temperature.
3. Global warming is not bad enough for us to be concerned.
4. There is no scientific consensus that global warming is caused by human activity.

More specifically, the most widespread theory against global warming (1) is that this climate change is just part of the Earth’s cycle because it has happened before. The claim is that the Earth has gone through ice ages and warm periods in the past where the temperatures were higher than they are now despite CO<sub>2</sub> levels being lower. There is some data and calculations to support this. (Resisting Climate Hysteria) The second major argument is that the Sun is causing an increase in temperature. The data supporting this is a correlation in the past between an increase in the number of sunspots and an increase in the global temperature. Currently, there has been a lot of solar activity. Therefore the Sun

must be the cause of global warming. (Whitehouse) The third most popular theory against global warming is that it is not bad enough for us to be concerned about it. The argument is that even though it is caused by gas emissions, it does not have enough ramifications in the near future to make global warming a high priority. There are so many other things that are wrong with the world and with societies. We should focus our energy on these because they are more important and demanding of our attention. (500 Scientists) And lastly, the Petition Project stated, "There is no convincing scientific evidence that human release of carbon dioxide will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere." 31,000 scientists signed this statement. (Global Warming Petition Project)

All of these arguments against global warming are wrong in some fundamental way, though. Firstly, the natural climate change in the past provides us with evidence that the climate is sensitive to energy imbalance. This shows that if the planet accumulates heat, then temperatures will rise. The raised amounts of carbon dioxide emissions producing the greenhouse effect are effectively creating an energy imbalance. Thus making Earth more vulnerable to climate changes. This actually helps our claim that the climate's sensitivity to carbon dioxide is causing global warming. (Climate Science Glossary) Secondly, according to scientists and data of the Sun's TSI records for the past few decades, the sun is actually cooling slightly. (Data) Which means that climate change and sun temperatures have been going in opposite directions. This disproves the claim that the sun causes global warming. Also, global warming is very serious. Thirdly, as previously stated above, the IPCC predicts in their *Fourth Assessment Report* from 2007, that an increase in temperature of no more than 3°C will cause irreparable damage. (IPCC Fourth Assessment Report) An increase to as much as 4°C will potentially be catastrophic. Lastly, there is most definitely a consensus

within the scientific community about the causes of global warming. To be more exact, there is a 97-98% consensus from surveys of peer-reviewed scientific literature and the experts, in favor of humans causing global warming. (Climate Science Glossary)

In conclusion, I explained that global warming is problematic and is caused from human activity and excess emissions of carbon dioxide. I explained why we should be concerned about this and some of the consequences that global warming can have on the world. I laid out the arguments against this claim, namely that the climate has changed before, the sun is causing it, global warming is not serious, and there is no consensus. I then followed by explaining why each of these arguments are wrong by stating that the carbon dioxide is causing an energy imbalance which makes the climate more sensitive, the sun has gradually been cooling for the past 35 years, the consequences of climate change can be catastrophic with as much as a 4°C warming, and that 97-98% of scientific literature and experts believe that global warming is caused by human activities.

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