

FUNH5000 Essay 2

Solutions to Climate Change

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1 Introduction of Climate Change

One of the most difficult and urgent issues confronting humanity now is climate change. Science, economics, society, politics, and moral and ethical issues are only a few of the many facets it covers. This is a worldwide problem with regional effects, and its effects will last for millennia. The main greenhouse gas responsible for the recent global warming, carbon dioxide (CO₂), has been present in the atmosphere for millennia. Furthermore, warming has a delayed effect on the Earth, especially its oceans. Therefore, the consequences of climate change and global warming would still affect future generations even if we stopped emitting greenhouse gases right away. Accordingly, people are already “committed” to a certain extent to climate change.

The trajectory of our greenhouse gas emissions and the way the climate system reacts to them will determine how much of a change this represents. Greenhouse gas emissions have been gradually increasing despite increased awareness of climate change. For instance, for the first time in recorded human history, atmospheric carbon dioxide levels surpassed 400 parts per million (ppm) in 2013. Approximately three to five million years ago, during the Pliocene Epoch, when the Earth’s climate was much warmer than it is today, such levels were last attained.

2 Countermeasures to Climate Change

Given that we are already committed to some degree of climate change, addressing this issue requires a dual approach:

1. Reducing emissions of and stabilizing the levels of heat-trapping greenhouse gases in the atmosphere (“mitigation”);
2. Adapting to the climate change already in the pipeline (“adaptation”).

2.1 Mitigation and Adaptation

Mitigation The goal of mitigation is to reduce the amount of greenhouse gases that enter the atmosphere. Either lowering the sources of these gases—such as burning fossil fuels

for transportation, heating, or electricity—or improving the “sinks”—such as soil, forests, and oceans—that absorb and store them will accomplish this. Reducing human influence on Earth’s climate is the ultimate aim of mitigation. As per established frameworks, this entails maintaining food security, promoting sustainable economic development, and stabilizing greenhouse gas levels within a timescale that permits ecosystems to naturally respond.

Adaptation Making changes to existing or expected circumstances is part of adapting to a changing climate. In addition to taking advantage of any potential advantages, like extended growing seasons in some areas, the main goal is to lessen the risks associated with climate-related hazards, such as rising sea levels, extreme weather, and food insecurity.

Throughout history, societies have adapted to changing climates with varying degrees of success. For instance, the emergence and decline of civilizations have been influenced by changes in the climate, especially droughts. Because of Earth’s comparatively stable climate, modern agriculture and society have been able to flourish during the last 10,000 years. Our infrastructure and way of life, however, are designed for this stable climate rather than the warmer and more unpredictable ones that are anticipated in the ensuing centuries. Adaptation gets harder as the climate changes more quickly.

Even though climate change is a worldwide problem, local communities are most affected. An important part of adaptation efforts is played by local governments. Building flood defenses, being ready for heat waves and rising temperatures, installing better-draining pavements for stormwater management, and enhancing water storage and utilization are some of the ways that towns and communities around the world are attempting to solve their unique concerns.

Governments at all levels are progressively integrating climate adaptation measures into their development plans, according to the 2014 report from the United Nations Intergovernmental Panel on Climate Change (IPCC). Managing increasingly frequent and severe disasters, preventing sea level rise along coastlines, enhancing land and forest management, preparing for droughts, creating climate-resilient crops, and preserving vital infrastructure like public buildings and electricity are some of these tactics. To create a future that is more robust, these initiatives are crucial.

2.2 Pressures to government and business

To effectively combat climate change, it is essential to apply pressure on governments and businesses to take decisive actions in the following areas:

Invest in renewable energy. One of the best strategies to reduce dependency on fossil fuels is to switch to clean and renewable energy sources. Greenhouse gas emissions can be considerably decreased by using sustainable alternatives including solar, wind, wave, tidal, and geothermal energy.

Switch to sustainable transport. Transportation is a major contributor to climate change, with petrol- and diesel-powered vehicles, planes, and ships reliant on fossil fuels. In addition to lowering greenhouse gas emissions, promoting the use of electric vehicles, cutting back on automobile use, and decreasing air travel can help enhance air quality.

Improve farming and encourage vegan diets. Reducing meat and dairy consumption—or adopting a fully vegan diet—is one of the most impactful steps individuals can take to mitigate climate change. Simultaneously, businesses can promote sustainable farming practices and expand the availability of plant-based products, making these dietary shifts more accessible.

Restore nature to absorb more carbon. The natural environment plays a critical role in removing carbon dioxide from the atmosphere. The ability of ecosystems to sequester carbon can be improved by actions like planting trees in the right places and putting “rewilding”

programs into place. For instance, carbon dioxide is absorbed by photosynthesizing plants during growth and stored in biomass and soils.

Protect forests like the Amazon. Forests are vital in the fight against climate change, as they act as massive carbon sinks. However, these natural resources are threatened by extensive deforestation for purposes including soy production, animal husbandry, and palm oil plantations. Enacting and implementing stricter environmental regulations to stop the degradation of forests is one way that governments can solve this problem.

Reduce how much people consume. The climate is severely impacted by a number of contemporary lifestyle choices, including food, fashion, and transportation. Companies often overproduce goods, particularly in industries like fashion and technology, encouraging wasteful consumption patterns. Reducing overall consumption, particularly in wealthier nations, can alleviate this pressure on the planet.

Reduce plastic use. Because plastic is made from oil, its production involves a significant amount of carbon. Emissions are also increased by the disposal of plastic, particularly by burning it. According to the Paris Agreement, the manufacturing and disposal of plastic is expected to contribute 17% of the global carbon budget by 2050 due to the fast increasing demand for plastic. Addressing this issue can be greatly aided by reducing the usage of plastic, especially polyester and other plastic-based clothing substitutes.

3 Statement of AI Usage

As shown in Figure 1, I utilize the GPT model to provide about the introduction of climate change, for me to better organize the aspects of answers and solutions to combat climate change in our daily life.

The above generated contents are only used for reference and organizing my thoughts before writing, instead of directly use. Beyond this, I also use grammarly to check the grammar mistakes in this essay report.

Give an introduction about climate change

GPT-4o Poe

Introduction to Climate Change

Climate change refers to long-term shifts in global temperatures and weather patterns, primarily caused by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities release significant amounts of greenhouse gases (GHGs), such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), into the atmosphere. These gases trap heat, leading to a phenomenon known as the **greenhouse effect**, which disrupts Earth's climate system.

Over the past century, human influence has accelerated climate change, resulting in rising average global temperatures, melting glaciers, rising sea levels, and more extreme weather events such as hurricanes, droughts, and floods. According to the Intergovernmental Panel on Climate Change (IPCC), global temperatures have already risen by approximately **1.1°C (2°F)** above pre-industrial levels, with severe consequences for ecosystems, biodiversity, and human societies.

Key Causes of Climate Change

1. **Burning of Fossil Fuels:** Coal, oil, and natural gas combustion for energy and transportation are significant sources of CO₂ emissions.
2. **Deforestation:** Large-scale clearing of forests reduces the planet's ability to absorb CO₂, contributing to higher atmospheric levels.
3. **Industrial Processes:** Manufacturing, cement production, and agriculture release large amounts of greenhouse gases.
4. **Agriculture and Livestock:** Methane emissions from livestock and rice paddies, along with nitrous oxide from fertilizers, play a significant role.

Impacts of Climate Change

1. **Rising Global Temperatures:** Increased heat waves and shifting weather patterns are affecting ecosystems and human health.
2. **Glacial and Polar Ice Melting:** Accelerating ice loss in the Arctic and Antarctica contributes to rising sea levels, threatening coastal communities.
3. **Extreme Weather Events:** More frequent and intense hurricanes, droughts, and floods are damaging infrastructure and ecosystems.
4. **Ecosystem Disruption:** Changes in temperature and precipitation patterns are altering habitats, leading to species extinction.
5. **Human Health:** Rising temperatures exacerbate heat-related illnesses, spread diseases, and threaten food and water security.

Figure 1: Prompt of using GPT to answer "introduction about Climate Change".