

Name: .....

ID: .....

Section

--	--	--

# Global Warming Source Texts

## Problem and Solution Essay



Figure 1. Global Warming in Our Hands (Science Daily, 2010).

### Essay Prompt:

**It is argued that global warming is the most important environmental issues. Discuss the problem of global warming and evaluate two possible solutions.**

# Text 1: Global Climate Change

Global warming and climate change have dominated environmental news since the mid-1980s. Evidence suggests that the 20th century was the warmest century of the last 1000 years. Furthermore, average global temperatures indicate that the planet has warmed by 1 degree Celsius since 1905. Warming of the climate is also evident from increases in ocean temperatures, melting of snow and ice caps and rising sea levels. The vast majority of scientists agree that global warming is the greatest environmental challenge.

The current global warming problem is a result of the strengthening in the greenhouse effect. This is widely believed to be due to human activities. The greenhouse effect is the process by which gases in the atmosphere absorb heat. This causes average global temperatures to rise. The most significant factor in the increase of the greenhouse effect is pollution from greenhouse gases. These gases include; carbon dioxide (CO<sub>2</sub>), sulphur dioxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>).

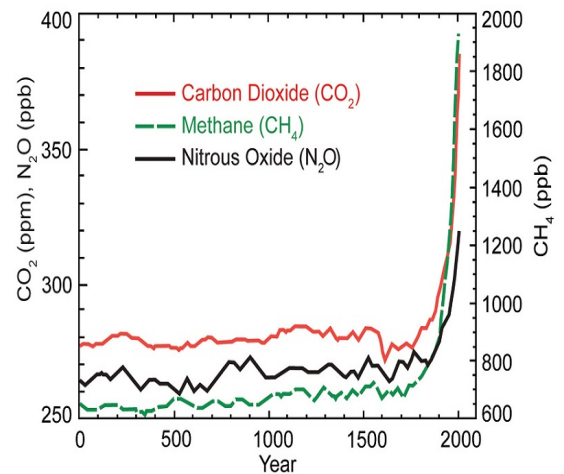
Over the last 200 years, human activity has dramatically increased the amount of greenhouse gases in the atmosphere. For example, levels of CO<sub>2</sub> have risen by 25% over the last 100 years. Half of this increase has been in the past 25 years. The most significant cause is the burning of fossil fuels to create energy for industry, transport and urban growth. Global CO<sub>2</sub> emissions from burning fossil fuels are responsible for more than 75% of the increase in CO<sub>2</sub> levels since pre-industrial times. Levels of methane (CH<sub>4</sub>) have increased 170% since 1750 because of agricultural growth. Methane is a much more powerful greenhouse gas than CO<sub>2</sub>.

As well as this, deforestation also leads to increases in CO<sub>2</sub>. Burning trees adds CO<sub>2</sub> to the atmosphere, and the reduction in the number of trees means less CO<sub>2</sub> is absorbed from the atmosphere. Deforestation contributes to between 12 and 17% of global greenhouse gas emissions.

Using more renewable sources of energy can reduce the emissions of greenhouse gases. Many people believe that a 100% renewable energy system is possible on a national scale using existing technologies. Denmark has kept its energy consumption stable for 35 years while maintaining economic growth. It could become completely reliant on renewable energy by 2050.

A report published by the International Energy Agency predicts that renewables will grow rapidly in the next five years. Wind, solar and other renewables sources are expected to increase their share of global electricity from 25% in 2017 to 30% by 2023. Solar power is expected to increase dramatically over the next 5 years. In 2023 China is expected to have 40% of the world's solar power capacity.

Figure 2. Atmospheric Greenhouse Gases (ACS, 2015).



Source: Middleton, N. (2013). *Global casino*. Abingdon, England: Routledge.

## Text 2: The Potential Consequences of Global Warming

Climate scientists have stated that global climate change is taking place as a result of human activity. This is mainly the result of the burning of large amounts of fossil fuels – coal, oil and natural gas. When these fuels are burned, carbon is released into the atmosphere as carbon dioxide (CO<sub>2</sub>). CO<sub>2</sub> levels in the Earth's atmosphere have increased significantly since the industrial revolution. They have risen about 40% between the mid-1700s and the present. These increased gas emissions are the result of economic and population growth.

If present trends continue, the amount of CO<sub>2</sub> in the atmosphere is expected to be double the preindustrial level by 2100. According to the latest Intergovernmental Panel on Climate Change (IPCC) report, that will lead to an increase of 3.7 to 4.8 degrees Celsius in average global temperature before the end of the century.

As a consequence of global warming, the intensity of 'extreme weather events' such as hurricanes/cyclones, violent thunderstorms, winter storms, and windstorms, are expected to increase. In North America, between 2005 and 2015, some of the most devastating storms in modern times occurred. These included major hurricanes causing billions of dollars of damage in the US cities of New Orleans and New York.

Another probable effect of the warming of the Earth's climate is the levels of the oceans will rise between 20 to 80 centimeters by the end of the twenty first century. This could lead to the evacuation of some coastal cities around the world. Sixteen of the world's largest cities with populations of over 10 million are located in the coastal regions.

The rich countries will be able to build sea walls to protect their cities, but poor countries such as Bangladesh cannot afford to do so. Island nations such as the Maldives in the Indian Ocean and the Marshall Islands in the Pacific Ocean could be completely flooded and even disappear.

Also of concern is food production. It is very hard to predict how climate change will affect agriculture in a specific area. However, it is clear that overall food supply will be severely disrupted by climate change. A recent study by the US National Academy of Sciences concluded that even a 1-degree Celsius increase in temperature would lead to a 10% decrease in corn, wheat and rice yields.

Studies have shown that since the 1960s spring has come earlier and winter later for the higher latitude areas in the northern hemisphere. However, even as the growing season is extended, there has been an overall reduction in crop yields. Climate changes will affect wheat and corn production across the globe, causing increases in the price of food and cereals.

Few scientists doubt that future climate change will have an impact on the way all humans live.

**Source: Seitz, J. L. & Kristen, A. (2012) *Global Issues*. Oxford, England: Blackwell.**

## Text 3: The Renewable Future

The possibly disastrous effects of global warming have convinced many that the only solution to this problem is to use 100% renewable energy for total energy supply. Renewable energy is created from renewable resources, such as solar power, wind power and hydropower.

Energy from the sun is collected using solar panels and converted into electricity. Windmills have been used for hundreds of years to convert wind power into useable energy. Today, enormous wind turbines are used to generate electricity. These turbines are often placed together in wind farms in areas with strong winds. These farms can be on land or at sea. When water is used to generate electricity, it is called hydropower. Most hydropower plants use a dam on a river to create a reservoir to store water. As water is released from the reservoir it activates a generator that produces electricity.

Renewable energy systems are rapidly becoming more efficient and cheaper. Their share of total energy is increasing. Growth in consumption of coal and oil could end by 2020 due to increased use of renewables and natural gas.

At least 30 nations around the world already have renewable energy contributing more than 20% of their total energy supply. In total, renewables contributed 23.7% to global energy consumption in 2015. Worldwide investments in renewable technologies amounted to more than US\$286 billion in 2015. Countries like China and the United States are heavily investing in wind, hydro, and solar power.

Some regions and at least two countries, Iceland and Norway, already generate all their electricity using renewable energy, and many other countries aim to reach 100% renewable energy in the future. For example, in Denmark, the government has decided to switch the total energy supply to 100% renewable energy by 2050.

According to the International Energy Agency (IAE), solar power may produce most of the world's electricity within 50 years, reducing the emissions of greenhouse gases that harm the environment. David Evans, senior analyst in the renewable energy division at the IEA said: "Photovoltaic and solar-thermal plants may meet most of the world's demand for electricity by 2060 with wind, hydropower and biomass plants supplying much of the remaining generation".

In 2014, global wind power capacity expanded 16%. Yearly, wind energy production is also growing rapidly and has reached around 4% of worldwide electricity usage, 11.4% of total EU usage, and it is widely used in Asia, and the United States of America.

**Source: Protecting the Planet. (n.d.). Retrieved from <https://www.qld.gov.au/environment/>**

## Text 4: Can Governments Save the World from Climate Disaster?

Melting polar ice caps, rising sea levels and increased incidents of extreme weather are all of growing concern. These effects of global warming make it clear that economic development based on the burning of fossil fuels is not a sustainable form of development. In order to effectively address global warming, there must be a significant reduction in the amount of greenhouse gas emissions. One way to achieve this, and solve the problem of global warming, is through international agreements and laws to reduce the burning of fossil fuels.

The first attempt at this was the United Nations 1992 Rio Earth summit. 150 governments signed a voluntary agreement to reduce CO<sub>2</sub> to 1990 levels. Following this, in 1997, the Kyoto Protocol attempted to force countries by law to make reductions. It also added more greenhouse gases such as methane, nitrous oxide and hydrofluorocarbon to the agreement.

However, the Kyoto Protocol was only in place until 2012. When it came time to extend it to 2020, several developed countries declined to agree to targets for reduction of greenhouse gases. The Kyoto Protocol technically remains in force, but its targets cover only a small fraction of global greenhouse gas emissions, and there is no expectation of new future targets.

The Paris Agreement of 2015 obtained commitments from nearly every nation on earth to act on climate change. The commitments cover emissions from 190 countries—97% of all global greenhouse emissions. The agreement secured, for the first time, commitments from all key countries—including China, India, Mexico, Europe, Japan, and the USA—to reduce their emissions. However, in 2017, President Donald Trump announced his intention to withdraw the United States from the Paris Agreement. Despite this, the USA will continue negotiating the Paris rules and may remain in the agreement under revised terms.

**Source:** Flannery, T. (2014, August 1). *Can governments save the world from climate disaster? The Guardian*. Retrieved from <http://www.the-guardian.com>



## Text 5: Global Temperature Changes: An Uncertain Future

Global warming is an observed increase in the average temperature of the Earth's atmosphere and oceans. The National Academy of Sciences states that the average global temperature has risen 1 degree Celsius since the end of the 19<sup>th</sup> century. Some of the increase may be natural, but scientists suggest that during the past 50 years, most of it has been caused by humans. The increase in greenhouse gases, caused by deforestation, agricultural changes and other human activities, has contributed to the problem.

Climate change will mean that sea levels could rise 0.5 meters by 2050. This change will lead to an increased risk of floods in large coastal cities between now and 2050. Most of the world's major cities are in coastal regions. Currently 80% of the world population live within 100km of the coast.

It is estimated that the global cost of flooding in 100 of the world's largest coastal cities, could increase to US\$52 billion by 2050. The cities most 'at risk' today are in both developed and developing countries and include; Guangzhou, New York, Ho Chi Min, Mumbai, Petersburg, Shenzhen, and Vancouver.

In Asia, global warming and climate change are affecting food production. In 2011 a severe drought in China increased food prices worldwide. In southern China, droughts have replaced rainy seasons, and this has affected the production of rice. The National Academy of Science expects basic food supplies to decrease significantly around the year 2030.

As a result of climate change, many African countries already experience longer and more severe droughts and floods. A study by the UN suggests crop production across sub-Saharan Africa may decline 5-22% by 2050. Both of Africa's main crops, maize and sorghum, are expected to be badly affected by increasingly extreme temperatures. Droughts are expected to become more frequent. Studies suggest that up to 200 million people will be seriously affected by changes in food production and food prices by 2050.

These worrying effects demand solutions. However, at present international agreements intended to reduce global greenhouse gas emissions seem to be having little effect. After levelling off between 2014 and 2016, carbon emissions increased 1.4% in 2017. This is a result of global economic growth. All governments seem to believe that this growth must be based on increased energy consumption, and most of this comes from burning fossil fuels. If these fuels continue to be used for more than 80% of world energy, CO<sub>2</sub> emissions will increase 300% by 2050.

**Source: National Research Council. (2012). *Reconciling Observations of Global Temperature Change*. New York, NY: Pergamon.**