Forum: Environment Committee
Issue: Climate Change
Student Officer: Rose Vennin

Introduction

1,4 to 5,8 °C : that is the spectrum of the provisional rise of temperatures until 2100 depending on the different scenarios of world evolution which most scientists have agreed upon. This rise in temperatures is part of a more global concept which is climate change, one of the most critical environmental issues that our planet is facing today and will have to deal with tomorrow. Indeed the effects of climate change are well known to many yet controversial as feared and denied by some who refuse to see these consequences by attributing their causes to other factors.

Although climate change can be defined as the adjustments of the climate due to natural phenomenons such as oceanic circulation, variations in solar activity or volcanic eruptions, it has replaced the term of “anthropogenic climate change”, in other words climate change caused by humans. It is therefore commonly used to describe the past, current and future effects of human activity on the planet and includes “major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer”.

Definition of key terms

Climate: usually described as “average weather”, it refers to the state of the atmosphere (wind, rain, temperature) over a long period of time whilst including variations due to extreme weather variations (different from a day-to-day weather)

Carbon Footprint: the total amount of greenhouse gases emitted into the atmosphere due to a certain activity by a person, family, building, company or organization including the ones that are indirectly released (through the consumption of a greenhouse gas emitting good for example)

Global Warming: according the Environmental Protection Agency it is “the recent and ongoing rise in global average temperature near Earth's surface”. Mostly caused by the increase in the concentrations of greenhouse gases, global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change.

Greenhouse gas: any gas that absorbs or emits radiation and acts as a shield by trapping the heat in the Earth’s atmosphere. This is a generic term for a group of gases which includes (between many others) water vapour; carbon dioxide, a naturally occurring gas of which the production has been increased by human activity and is one of the principal human-caused

gases contributing to the greenhouse effect; and methane, a hydrocarbon with the estimated potential of having an effect 25 times bigger than carbon dioxide on global warming.

Greenhouse effect: Trapping and building up heat in the atmosphere - thermal radiation is absorbed by greenhouse gases and re-emitted, keeping the planet warm compared to outer space; if the concentration of these greenhouse gases rise, then the average temperature of the Earth's lower atmosphere will rise too.

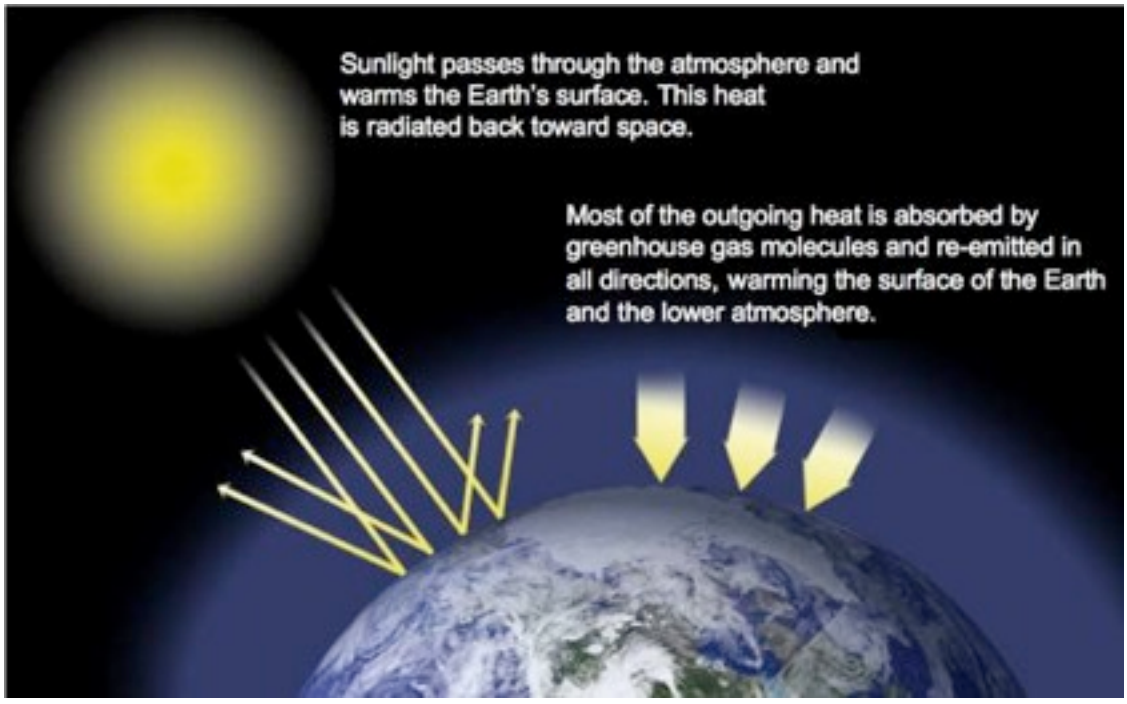

Diagram showing the (simplified) mechanism of the greenhouse effect

Ozone layer: shielding the Earth from dangerous ultraviolet, ozone levels over the northern hemisphere have been dropping by 4% per decade; 5% of the Earth's surface Ozone layer is depleted mostly around the north and south poles in great part due to human activity such as the emission of nitrous oxide, an ozone-depleting substance.

Background Information

Since the first calculations of human induced climate change in the late 1890s, the recognition of climate change and its consideration as a critical issue has drastically changed. Indeed, whilst some in the 1960's denied the warming of the planet was due to human activities, by stating that they were actually cooling the atmosphere, it became clear in the late 1970s amongst scientists that climate change did exist, partly thanks to the serious droughts and other unusual weather patterns which increased scientific and public concern. In the 1990s, with the development of more accurate computer models, a consensus was formed that greenhouse gases played a role in climate change and global warming and Man were contributing to this phenomenon.

There have always been fluctuations in the Earth's climate, yet it is now evolving at an unprecedented rate. Whilst natural phenomenons (called "natural causes") help keep our planet warm and therefore are vital for human life, today human activities are the contributors to unwanted and harmful climate change. **Through the increase in greenhouse gases releases (+70% between 1970 and 2004), the environmental consequences of these human activities enhance the greenhouse effect which in turn is the principal causes for un-natural climate change.** According to the Intergovernmental Panel on Climate Change (IPCC), the three main origins of this rise in greenhouse gases observed over the past 250 years have been fossil fuels, land use and agriculture.

Firstly, the pollution due to the use of **fossil fuels** accounts for 3/4 of the emissions of carbon dioxide. After the Industrial Revolution in the 19th century the use of this energy became a large-scale one and fossil fuels such as oil, coal and natural gas now supply most of the energy needed for human activities such as vehicles, electricity for industries and households, industrial production, heating, etc... The carbon dioxide released consequently (in 2005 energy was the sector emitting the most carbon dioxide with 66.5% of its global emissions, whilst agriculture accounted for 13.8%, land use change 12.2%, industrial processes 4.3% and waste 3.2%) has grown by 80% between 1970 and 2004 (IPCC) and is the most important greenhouse gas.
Human Land use is also a factor in the changing of our climate. The most environmentally preoccupying contributor in terms of land use is deforestation. Responsible for 17% of the carbon dioxide emissions in the 100 years warming impact, the destruction of forests and especially rainforests is known as one of the major enhancers of the greenhouse effect. Trees are reservoirs of stored carbon and if a forest is burnt or destroyed then the carbon dioxide is released into the atmosphere, adding to the carbon dioxide levels.
Agriculture is very much linked to land use as many a times forests are destroyed to grow crops. However, agriculture itself has an impact on climate change. Methane, a contributor to the greenhouse effect, is released through livestock farming and rice cultivation which account for 54% of these emissions.

The consequences of climate change are huge and cover many aspects of the world's issues. More than just the temperature rises, climate change will affect precipitations, wind patterns and extreme weather event. These in turn will affect many sectors of human activity. The most well known are agricultor with the reduction of yields due to aridity (rise of temperatures and drop in precipitations in subtropical land regions): a study published in Science showed that "southern Africa could lose more than 30% of its main crop, maize, by 2030. In South Asia losses of many regional staples, such as rice, millet and maize could top 10%"; an increased frequency of hot extremes, heat waves and unusual precipitation will affect human health by exacerbating deaths and diseases with malnutrition, diarrheal, infectious and insect-transmitted diseases which are most likely to touch particularly third-world countries. Other consequences could be the reduction of water availability; desertification; rises in flooding (irregular precipitations), sea levels with the melting of land-based ice and in tensions concerning migration or over resources.

An interactive map on the consequences of a 4°C temperature rise can be found here:
http://webarchive.nationalarchives.gov.uk/20100623194820/http://www.actoncopenhagen.decc.gov.uk/content/en/embeds/flash/4-degrees-large-map-final

Major Countries and Organizations involved

There are no major countries involved as all countries are concerned by this issue, yet a particular attention has to be paid to developing countries to ensure that their societal models contribute as little as possible to climate change.

Intergovernmental Panel on Climate Change (IPCC)
The main organization involved in climate change, it is a United Nations body founded in 1988 which evaluates climate change science. It assesses research on climate change and publishes a report every 5-7 years. The last report was the fourth one in 2007 and the next one is scheduled to be released during 2013 and 2014. It is comprised three working groups which are Working Group One (WG1) which examines scientific evidence for climate change and the extent to which human activity is the cause, Working Group Two (WG2) which focuses on the impacts of climate change, and how plants, animals and humans can adapt and Working Group Three (WG3) which focuses on climate mitigation. The panel itself is composed of 194 country representatives and reviews and agrees on the reports from the different working groups.

Greenpeace and other organizations are not entirely devoted to climate change yet they undertake actions punctually to raise public awareness on this issue.

Timeline of Events

1896 - Swedish chemist Svante Arrhenius concludes that industrial-age coal burning will enhance the natural greenhouse effect
1927 - carbon emissions from fossil fuel burning and industry reach one billion tonnes per year
1938 - after observing rises in temperatures and in carbon dioxide concentrations, British engineer Guy Callendar suggests that the later causes the former
1958 - Charles David Keeling begins systematic measurements of atmospheric CO2 at Mauna Loa in Hawaii and in Antarctica and demonstrates four years later that carbon dioxide concentrations are rising
1970 - Creation of U.S. National Oceanic and Atmospheric Administration, the world's leading funder of climate research
1987 - Montreal Protocol agreed, restricting chemicals that damage the ozone layer.
1988 - the IPCC is formed
1990 - the IPCC publishes the First Assessment Report which concludes that "temperatures have risen by 0.3-0.6C over the last century, that humanity's emissions are adding to the atmosphere's natural complement of greenhouse gases, and that the addition would be expected to result in warming"
1992 - at the Earth Summit in Rio de Janeiro, governments agree to the creation of the United Framework Convention on Climate Change and to return to their 1900 emission levels
1995 - the IPCC's Second Assessment Report concludes that the balance of evidence suggests "a discernible human influence" on the Earth's climate
1997 - Kyoto Protocol

2001 - the IPCC's Third Assessment Report finds "new and stronger evidence" that "humanity's emissions of greenhouse gases are the main cause of the warming seen in the second half of the 20th Century"
2005 - the Kyoto Protocol becomes international law for the countries who have ratified it
2006 - the Stern Review concludes that "climate change could damage global GDP by up to 20%" if left unchanged
2006 - carbon emissions from fossil fuel burning and industry reach eight billion tonnes per year.
2007 - the IPCC's Fourth Assessment Report establishes that it is more than 90% likely that Man's emissions of greenhouse gases are responsible for modern-day climate change
2008 - 50 years after beginning observations at Mauna Loa, the Keeling project demonstrates that carbon dioxide concentrations have risen from 315 parts per million (ppm) in 1958 to 380ppm in 2008.
2009 - Copenhagen Conference produces the Copenhagen Accord which aims to limit a future temperature rise to 2°C
2011 - Durban Conference which agrees to establish a legally binding deal by 2015 to limit carbon emissions
2011- creation of the Green Climate Fund which assists developing countries in climate change mitigation and adaptation by transferring money from developed to developing countries
2012 - Doha Conference: extension of the Kyoto Protocol and introduction of the "loss and damage" concept (richer nations could be financially responsible for other nations' failure to reduce carbon emissions)

Relevant UN treaties and Events

United Nations Framework Convention on Climate Change (UNFCCC)
It is an international environmental treaty established during the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. Its key objective is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". However it is a non legally binding treaty providing a framework for the negotiation of international treaties that can set legally binding limits to greenhouse gas emissions.
The different parties of the convention have met annually at the **Conferences Of the Parties** (COP) to evaluate the progress made in climate change mitigation

Kyoto Protocol
Adopted in 1997,the protocol set binding obligations on industrialized countries to reduce their greenhouse gases emissions. Developed nations pledged to reduce emissions by an average of 5% by the period 2008-2012, with wide variations on targets for individual countries. The US Senate immediately declared it would not ratify the treaty.

Bali Road Map
The 2007 Bali Climate Change Conference concluded with the adoption of the Bali Road Map which consisted in a 2 year process to come to binding agreements to reach a secure climate future. The Bali Road Map included the Bali Action Plan which created a new negotiating process designed to tackle climate change.

Copenhagen Accord
Adopted in 2009 at the Copenhagen Conference, the non legally binding Copenhagen Accord aims to limit a future temperature rise to 2°C and underlines “the crucial role of reducing emission from deforestation and forest degradation”. Furthermore, it contained the first mention of the **Green Climate Fund** which was installed in 2011 and financed developing countries’ reduction of greenhouse gas emissions.

Previous attempts to solve the issue

The UN treaties and events mentioned above constitute the international attempts to solve climate change with different resolutions adopted at each Conference Of the Parties.

Possible solutions

It is very difficult to name only a few solutions as climate change is a broad issue and has multiple causes of different nature. However some of them include reducing the use of fossil fuels in industry and households by developing new sustainable methods of energy production (renewable energies) which Twenty Small Island Developing States have started to do in May 2012 by taking action against fossil fuel dependency for example.
Another solution could be energy conservation (prevention of increases in greenhouse gases emissions) with infrastructure upgrades, encouraging eco-friendly lifestyles (careful uses of heating, lights, etc...), recycling materials when possible (in order to avoid the production of new ones)...
Furthermore, a better use of land and improved agricultural practices are imperative to counter climate change. Encouraging reforestation, limiting deforestation by encouraging the consumption of certified products, establishing mechanisms rewarding the protection of forests, reducing human impact of agriculture through the limitation of intensive farming for example are potential solutions.
Raising awareness through media campaign is also important as these inform individuals about the state of the world’s climate and the changes that are occurring.
Delegates are not expected to cover all of these areas in their clauses and may focus on some of the potential solutions including ones that are not mentioned above.

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