United Nations Environment Programme (UNEP)

THE USE OF ARTIFICIAL INTELLIGENCE TO REVERSE CLIMATE CHANGE

Study Guide

Singularity Model of United Nations
SMUN2030

SINGULARITY FOUNDATION

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Welcome letter

Dear delegates,

A warm welcome to the Energy Committee of Singularity Model United Nations 2030. Over the course of 3 days, you are going to try to find solutions for one of the most challenging problems our world faces today as you represent your respective countries and seek a resolution, as far as possible. The topic that we have chosen is 'The Use of AI in Energy to reverse global warming'.

Whether this is your first encounter with Model United Nations or if you have prior experience, we trust that each and every one of you will have an enriching experience debating this issue. As you engage with like-minded colleagues, we hope you challenge yourselves to think critically from different points of view and generate innovative solutions to tackle the problems presented here. You will also improve your skills of public speaking and diplomacy, as you seek to negotiate compromises and agreements with other delegates, and hopefully, forge some meaningful friendships along the way.

We wish you all the best and hope you have an enjoyable time in SMUN2030. If you have any questions, please feel free to approach anyone of us and we will be more than happy to help.

Looking forward to seeing you,

Júlia Altirriba

Pablo Homar

Chair Biography

Chair Director:

Pablo Homar

Pablo is a nineteen-year-old student of Architecture in the Polytechnic University of Valencia. He was born in Mallorca but moved to Valencia to study his degree. In 2018, he was a delegate in CWMUN-New York, representing the country of Togo. He was in the United Nations Office on Drugs and Crime (UNODC) with the goal of fighting human trafficking.

He loves basketball and has played in a high school team his whole life. Also, he likes to read and watch some television series, and, of course, travelling around the world.

Chair Assistant:

Júlia Altirriba

Júlia is an eighteen-year-old 2nd of *bachillerato* (A levels) student in a high school in Barcelona, where she was born. In 2018, she was a delegate in CWMUN-Barcelona representing the Russian Federation. She was in the Security Council with the goal to find a solution for the unregulated use of nuclear weapons around the world.

She loves dancing and goes to an academy three times a week to release some stress and work out. She also loves reading, any kind of book, and, of course, meeting with her friends whenever possible.

Introduction to the committee

The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment.

This committee was established in the 1972 due to the need of developing laws such as the International Labour Organization (ILO), the Food and Agriculture Organization (FAO), and the World Health Organization (WHO). This led to the 1972 United Nations Conference on Human Environment to tackle the pollution caused by the industrial revolution during the 1960s and 1970s. In this conference, various topics including marine life, protection of resources, environment change, disasters related to nature, and biological change were discussed. This conference resulted in a Declaration on the Human Environment and the establishment of an environmental management body, which later was named United Nations Environment Programme (UNEP).

The committee's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

Headquartered in Nairobi, Kenya and now composed of 193 Member States, they work through their divisions as well as their regional, liaison and out-posted offices and a growing network of collaborating centres of excellence. They also host several environmental conventions, secretariats and inter-agency coordinating bodies.

UNEP categorizes their work into seven broad thematic areas: climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency, and environment under review. In all of their work, they maintain their overarching commitment to sustainability.

Every year, they honour and celebrate individuals and institutions that are doing outstanding work on behalf of the environment.

They also host the secretariats of many critical multilateral environmental agreements and research bodies, bringing together nations and the environmental community to tackle the greatest challenges of our time.

Introduction of the topic

In a world where technology can take men to the moon, view the collision of atoms and bend the rules of nature, it is horrific that sometimes the only thing that prevents man from sustainable development is man himself.

Over the past few decades, humans' relentless pursuit of development has had adverse ramifications on our environments and people. This is manifested in a slew of pressing global issues today, such as climate change to resource scarcity. It is thus now more critical than ever that we identify and consider the possible solutions to this monster we have created.

One of the most important advances that has taken place over the course of the last few years is the development of artificial intelligence. It is changing society by the day and improving the lifestyle of people. However, the use of it has never been implied with the problem of climate change, the biggest challenge that humanity is facing. The ability of artificial intelligence to adapt in each situation and to act depending on the surrounding situations, can make them a key factor into fighting climate change.

In the last years, climate conventions have reduced the number of natural resources that are being depleted. On the other hand, all the natural resources that have been lost must recover, because they are essential for the sustainability of the planet, and there is no better way to do it than with technology, and specially, artificial intelligence.

The goal of this committee will be to start to imply artificial intelligence inside the institutions and promote the use of technology in order to reverse climate change.

History of the topic

Halfway into the XX century, scientific began to rise the question of the impact that humans where having in the world, and soon evidence began to come in saying that the footprint that society was having into the world.

But it wasn't until 1992 when the UN took a first move into it by producing the United Nations Framework Convention on Climate Change (UNFCC). Since then, the UN has become the forefront of the fight against the climate change. Nowadays, the UNFCC is a global organization with 197 that have signed in.

In 1995 countries decided to go further in their moves against climate change and launched the Kyoto Protocol. The goal of this protocol was to reduce emissions to the atmosphere. The first part of the agreement started in 2008 and ended in 2015, and the second part ended in 2020.

In 2015, countries of the UNFCC reached an agreement to intensify the actions and investments needed for a sustainable future. For the first time in history, all nations came together to a common cause to combat one of the biggest challenges' humanity has ever faced.

At the end of the decade, in 2019, a Climate Summit was called due to the emergency situation that the world was trespassing. Measures had to be intensified and a convention was held in Madrid. Also, society began to wake up and the Green Movement began: massive manifestations where held in multiple cities around the world claiming for government action.

Definition of Key Terms

- CARBON DIOXIDE (CO_2): is the primary greenhouse gas and driver of climate change. It's an integral part of life cycles on earth, produced through animal respiration and absorbed by plants to fuel their growth, to name just two ways.

- GREENHOUSE GAS: a greenhouse gas is a chemical compound found in the Earth's atmosphere, such as carbon dioxide, methane, water vapor, and other human-made gases. These gases allow much of the solar radiation to enter the atmosphere, where the energy strikes the Earth and warms the surface.

- EMISSIONS: in the climate change space, emissions refer to greenhouse gases released into the air that are produced by numerous activities, including burning fossil fuels, industrial agriculture, and melting permafrost, to name a few.

- WEATHER VS CLIMATE: it's all about timing when it comes to differentiating weather and climate. Weather refers to atmospheric conditions in the short term, including changes in temperature, humidity, precipitation, cloudiness, brightness, wind, and visibility. While the weather is always changing, especially over the short term, climate is the average of weather patterns over a longer period of time.

- GLOBAL WARMING VS CLIMATE CHANGE: many people use these two terms interchangeably, but we think it's important to acknowledge their differences. Global warming is an increase in the Earth's average surface temperature from human-made greenhouse gas emissions. On the other hand, climate change refers to the long-term changes in the Earth's climate, or a region on Earth, and includes more than just the average surface temperature. For example, variations in the amount of snow, sea levels, and sea ice can all be consequences of climate change.

- FOSSIL FUELS: fossil fuels are sources of non-renewable energy, formed from the remains of living organisms that were buried millions of years ago. Burning fossil fuels like coal and oil to produce energy is where the majority of greenhouse gases originate.

- SEA-LEVEL RISE: sea-level rise as it relates to climate change is caused by two major factors. First, more water is released into the ocean as glaciers and land ice melts. Second, the ocean expands as ocean temperatures increase. Both of these

consequences of climate change are accelerating sea-level rise around the world, putting millions of people who live in coastal communities at risk.

- GLOBAL AVERAGE TEMPERATURE: Global average temperature is a long-term look at the Earth's temperature, usually over the course of 30 years, on land and sea.

- RENEWABLE ENERGY: Renewable energy is energy that comes from naturally replenished resources, such as sunlight, wind, waves, and geothermal heat. By the end of 2014, renewables were estimated to make up almost 28% of the world's power generating capacity, enough to supply almost 23% of global electricity.

The Current Situation

There are multiple areas that affect climate change directly, some of them are causes and the others are consequences and all of them affect one another. However, these aspects have to be fought individually because the way of reversing them are very different from one another. The situation globally has reached a point that now we have to fight also the consequences that society has made, because if not, ecosystems may not recover, temperature will not stop rising…

Although everybody knows about climate change, governments are reluctant to adopt new and important measures because they require a lot of money and countries doesn't find it as important as other matters. But each day, evidence is proving them wrong, now it's the moment of action and some important measures must be taken.

Some of the areas that we find more important and where we think that artificial intelligence will make a biggest change are the next ones.

City emissions

Nowadays, cities consume around the 78% of global energy and produce the 60% of the CO_2 emissions. This is due to the fact that most humans live in super-cities that need millions of resources to sustain.

We can divide the emissions of the cities into two parts: the ones made by cars and the ones that are emitted by buildings. This aspect is directly related with the production of energy, but the change of some habits inside the cities are essential to reverse climate change. Also, we have decided to divide it because the technology and artificial intelligence that can be used in each aspect is very different from one another.

Emissions released by cities: This type of emissions can be drastically reduced by developing different types of artificial intelligence. The problem with the emissions in the buildings is that they depend a lot in the individuals, is a type of contamination that require a participation of the society. But there are some measures that can be implemented. For example, the automatization of systems such as climatization of spaces, the use of illumination… Also, a better use can be done from natural resources, like solar energy with solar panels in public buildings, wind turbines… As we have stated before, this type of emissions depends a lot on renewable energies.

Emissions released by cars: Although transport is the factor that releases the most toxic gases, the action that artificial intelligence can make is tied on by the advances on electric cars… After a decade of constant progress, now, in 2030, autopilot system is beginning to install and electric cars continue to evolve. In order to advance faster, some measures must be taken to help people make the change to clean cars.

Renewable energies

The actions that can be taken in each field and everywhere in the world will be useless if the energy that we use is created burning non-renewable energies such as coal or fuel. For example, if all cars in the world are electric but, the electricity we use to move this car is made by burning coal, all measures adopted will be useless. During last years, coal plants have begun to close and natural gas plants have taken their place. But it is not enough, in some places, it is possible to produce all energy with wind or solar power, and this type of renewable energy is the one that has possibilities to reverse climate change.

Sea waste and pollution

Although the majority of people is aware of the situation of the oceans, thousands of tons of waste are being thrown into the sea each day. Also, in the oceans, islands of thousands of square meters of garbage are forming and growing. We have reached a point that we can no longer stop throwing waste at oceans, because the situation we already have is unsustainable. We have to clean them and do it as soon as possible, because each day, we keep losing marine life. The only solution that is possible is technology, because humans by themselves are not capable of stopping everything.

Temperature rise and desertification

As a consequence of the factors explained before, temperature is rising and shaping a new world. Each year, more and more square meters of natural soil is being destroyed by fires caused by the temperature rise that the world is going through. Every month we hear that we break records of the highest temperature ever recorded, and it is happening at a vicious speed. Since 2000, temperature has risen 1ºC approximately. If it rises 1,5ºC more degrees, we will destroy a lot of ecosystems and some areas will become

uninhabitable. Although the temperature rise is a consequence of a series of factors, it can't be reversed if we only stop contaminating. Some measures must be taken in order to change it. To stop desertification, the African Union has begun to build the Great Green Wall, an initiative that is going to build a gigantic forest that will cross Africa from west to east and is going to stop the grow of Sahara Desert.

Measures like that must be done throughout the world, deforestation and desertification is happening in a lot of places and it has to stop, because when an area is transformed into a desert it is almost impossible to change it back, so we can't let this happen.

Loss of natural life

The loss of natural life is the main consequence of climate change: the emissions released in the air, sea waste and temperature rise cause the death of millions of animals, plants, and also, humans. Pollution has become one of the main risk factors of multiple illness such as cancer or strokes.

At sea, the millions of pieces of plastic cause the death of animals and algae, and also the increment of sea temperature, reduces the level of oxygen that is essential to the sea life, and is causing the extinction of species.

The bushfires that are happening each year and always growing in violence and size, also kill millions of animals and ecosystems. The main problem of the bushfires is that they kill the soil, making it impossible to plant trees and reintroduce animals, because all the fungi and bacteria that are the base of all living ecosystems, are killed.

Just like if all the tragedies that are happening weren't enough, we keep deforesting to build houses and cities, and a lot of species are being running out of space to live.

This is why we can't just stop destroying habitats and polluting, changes are already happening because we have reached an unsustainable situation, nature won't thrive if we don't clean the oceans and rebuild ecosystems, and the only way to do that is with the help of the latest technologies, including artificial intelligence.

Past Actions

The main actions the UN has done over the last years have been the conventions of Kyoto, Paris and Madrid, but as artificial intelligence is still in development, there are not regulations yet. On the other hand, there are scientific articles that talk about it.

KYOTO PROTOCOL:

https://unfccc.int/resource/docs/convkp/kpeng.pdf

PARIS CONVENTION

https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf

MADRID 2019 CLIMATE ACTION SUMMIT

https://www.un.org/en/climatechange/assets/pdf/cas_report_11_dec.pdf

EMISSIONS GAP REPORT 2019

https://wedocs.unep.org/bitstream/handle/20.500.11822/30797/EGR2019.pdf?sequence=1&isAllowed=y

STATE OF CLIMATE CHANGE IN 2018

https://wedocs.unep.org/bitstream/handle/20.500.11822/30797/EGR2019.pdf?sequence=1&isAllowed=y

Conclusion / Summary

After three decades of measures trying to prevent climate change, evidence has proven that all the measures that were taken have been insufficient and climate change is getting worse by the day. In order to reverse it, we can no longer just reduce emissions and waste, we need to reverse all damage we have already caused.

We have pushed ecosystems to the verge of extinction and temperature is rising causing desertification. Seas and oceans are filled with plastic, forests are burning and the air is filled with greenhouse gases.

We need the most advanced technologies in order to reverse climate change. Artificial intelligence can make the difference to reverse climate change, this type of technology can adapt depending on their surrounding conditions.

Since the beginning of the century, the UN has done multiple resolutions and conventions trying to reverse it, but since technology is advancing at an extreme speed, artificial intelligence has never been legislated and taken into account. So, the main goal of this committee will be to create some measures that, with the use of artificial intelligence, will help to reverse climate change.

The main problem of all new measures that need to be implied is the great budget they require, this is the main reason why since today, there hasn't been a great accord.

Now it's time for the delegates to begin their research and find their country positions, to search possible alliances, to begin to think into possible measures...

Guiding Questions

1. What is the general view of your country in climate change?

2. What actions has your country taken to stop the progress of climate change?

3. To what extent do the actions of your country prevent climate change?

4. In the past, what resolutions has your country participated in?

5. What position has it taken? Who did it all with?

6. What are your country's thoughts on the correlation between technology and climate change?

Optional Reading

Jackie Snow; How artificial intelligence can tackle climate change: https://www.nationalgeographic.com/environment/2019/07/artificial-intelligence-climate-change/

Nicholas Farmen; How AI Is Helping Solve Climate Change: https://www.smashingmagazine.com/2019/09/ai-climate-change/

Multiple authors; Tackilng climate change with machine learning

https://arxiv.org/pdf/1906.05433.pdf

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https://www.climaterealityproject.org/blog/key-terms-you-need-understand-climate-change

https://www.un.org/en/climatechange/