



32nd Annual
**BRIGHAM YOUNG UNIVERSITY MODEL UNITED NATIONS
CONFERENCE**

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SECRETARIAT

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*Gen'l Assembly 2d
Committee*

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Org'n of American States

Jarrod Smith
*Treaty for the Non-
Proliferation
of Nuclear Weapons Rev.
Conf.*

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Dear Delegates,

Welcome to the 32nd annual Brigham Young University Model United Nations Conference (BYUMUN). I commend your decision to participate in the Model United Nations program, and am eager to see what ideas you will add to the global debate.

My name is Dallyn H. McCracken, and I will be your director for the United Nations Environmental Assembly (UNEA). I am currently a Senior at BYU, even though I still have more than a year before I graduate. I am a Linguistics Major, Middle Eastern Studies Minor, and I hope to attend law school upon graduation. Despite having not heard of MUN until August of 2020, I participated in a national competition in November of 2020 representing Turkey on the United Nations Environmental Assembly and in the New York international competition March 2021 representing Italy on the United Nations High Commissioner for Refugees. I learned more about the UN than I could have imagined, gained a love for diplomacy, and I made some amazing friends. These experiences were the brightest highlights of my pandemic riddled year. I believe that with effort and a desire to learn, you will enjoy and find similar value in your MUN experience.

The topics before the United Nations Environmental Assembly this year are:

1. Increasing the Safe Use of Nuclear Energy
2. The Role of Fossil Fuels in a Sustainable Energy System

The United Nations Environmental Assembly is the governing body of the UN Environment Programme (UNEP) and the head policy-making organ for the United Nations on environmental topics. This Background Guide is a springboard to further research, rather than a replacement to your own work. I hope that the knowledge you will gain in this process will aid you not only as a delegate at BYUMUN, but as a citizen of the world. If you have any questions or concerns, please feel free to contact me at the email below.

Dallyn H. McCracken
Director, United Nations Environmental Assembly
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Committee Overview

“Time is running out for us to act in a coordinated manner to prevent a looming environmental, economic and humanitarian catastrophe.”

— Inger Andersen, Executive Director of the United Nations Environment Programme

History

In 1972, the UN General Assembly adopted resolution 2997, which established UN Environment Programme as the official UN body concerned with environmental issues. UN Environment has facilitated multiple landmark agreements, such as the *Rio Declaration on Environment and Development* and the *Statement of principles for the Sustainable Management of Forests*, collectively known as Agenda 21, which set out the principles and action-plans that guide the UN, Member States, and the global community in combating environmental problems. As stated in resolution 2997, The UNEP governing council was comprised of 58 Member States who would serve three year terms. At the 2012 United Nations Conference on Sustainable Development (Rio+20), it was decided that the UNEP governing council would have universal membership, allowing all 193 Member States of the United Nations to participate. The first universal UNEP gathering occurred in 2013 where the governing council decided to rename the governing council to the “United Nations Environmental Assembly of the United Nations Environment Programme” (UNEA). This change was formally recognized by the General Assembly resolution 67/251.

Mandate, Functions, Power

As stated in UNGA resolution 2997 (1972), there are seven main functions of the governing council of the UNEP, which is now known as the UNEA. The first is to promote international co-operation with regards to the environment and to recommend, as appropriate, relevant policies to this end. The second is to provide policy guidance to the UN about the direction and co-ordination of environmental policies within the United Nations system. Third, to review reports about the implementation of environmental programmes within the United Nations system. Fourth, monitor global environmental conditions and inform Governments of emerging environmental problems of international concern. Five, promote contribution to and exchange of scientific information about the environment. Six, monitor the impact, including economic impacts, of national and international policies on developing countries. The final mandate is to review and approve the annual funds for the United Nations Environment Fund.

In 1997 the *Nairobi Declaration on the Role and Mandate of the United Nations Environment Programme* expanded the mandate and established the UNEP to be “the leading global environmental authority that sets the global environmental agenda.” This declaration was later endorsed by the General Assembly, representing the acknowledgement of all Member States that the UNEP is the leading international authority on environmental concerns and issues. This expanded mandate increased the UNEP’s access to data and scientific expertise while granting the UNEP allowance to monitor Member State’s compliance with international environmental laws. This allowed for the UNEP and now for the UNEA to help Member States to comply with environment standards set by the Assembly and other UN bodies.

Governance, Structure, and Membership

The initial structure of the UNEP governing council was composed of 58 Member States elected by the General Assembly to three-year terms. Different regions were allotted different amounts of Member States as follows: sixteen seats for African States, thirteen for Asian States, six for Eastern European States, ten for Latin American States, and thirteen for Western European and other States. This was a form that allowed for representation from all regions of the world. During the Rio+20 in 2012 it was

decided that the governing body was too selective and should include all Member States to the United Nations, reforming the UNEP governing council into the UNEA, represented by 193 Member States, each with an equal vote. Since the formation of the UNEA in 2012, it has helped significantly in improving Global environment, particularly with the contributions made to the *2030 Agenda for Sustainable Development* which it made a primary focus in the first two sessions.

The UNEA is the governing council of the United Nations Environmental Programme, but it is not the only body in the Programme. The Environment Secretariat is a small body that handles the day to day issues while the UNEA, or the governing council before Rio+20, is not in session. The secretariat is headed by the Executive Director of the UNEP who is nominated by the Secretary-General, and is elected by the General Assembly to a term of four years. The first Executive Director was Maurice F. Strong, and the current Executive Director is Inger Andersen.

The other main body within the UNEP is the Environment Co-ordination Board is chaired by the Executive Director of the UNEP. The board focuses on ensuring smooth co-operation between the UNEP and all bodies concerned in the implementation of environment programmes. The Malmö Ministerial Declaration of 31 May 2000 recognized that the UNEP had not achieved considerable co-ordination with as many organizations and governments as it should, and instructed that there be more co-ordination. Since the declaration, more co-ordination has been achieved, one result is the universal assembly established by Rio+20.

The UNEA meets every two years to review progress, discuss plans, set goals, and pass resolutions which advise the UN agencies, Member State governments, and other environmental organizations. The UNEP is a subsidiary body of the United Nations Economic and Social Council (ECOSOC) and reports to the council annually, and the ECOSOC reports on the UNEP annually to the General Assembly.

The UNEA maintains the ability to form its own subsidiary organs on a permanent or ad-hoc basis according to rule 63 of its Rules of Procedure. The main example of this is the subsidiary inter-sessional body, the Committee of Permanent Representatives, which consistently works between sessions to assist in ensuring the UNEA can run smoothly and effectively as the assembly meets only every two years. The committee prepares the meetings for the UNEA and also reviews the implementations of the Assembly's decisions. It is comprised of all accredited permanent representatives to the UNEA, now all 193 Member States. It was originally formed by the UNEP Governing Council in May 1985.

The UNEP has several divisions including, but not limited to, the Science Division focused on providing scientific data and information focused on promoting environmental policy; the Economy Division focused on ensuring global economic growth with regards to UNEP environment policies; and the Communication Division which develops and disseminates the messages and goals of the UNEP.

The UNEP is a member of the UN Environment Management Group (EMG) which is composed of 51 UN agencies and was established by General Assembly resolution 53/242 of 1999. The group was founded to work on issues of environment that require effort among multiple UN agencies and helps provide necessary co-ordination amongst the groups. Since the founding of the group, the UNEP frequently works through the group to accomplish its goals.

Five per cent of the Programmes annual funding comes from the UN Regular Budget and supports the secretariat and governing bodies within the Programme. The Environment Fund makes up another fifteen per cent of the annual budget and is approved annually by Member States within the UNEA. The other 80 per cent come from earmarked contributions, or donations that are designated for a specific purpose by the contributor. The Programme frugality and innovation in 2020 with its funds by maintaining a realistic budget, spending less than the budget, and receiving more money than expected.

Increased funding to the Environment Fund allows the Programme to spend the money in the way that it views most efficiently and is therefore the most important source of funding.

Recent Sessions and Current Priorities

Due to the ongoing pandemic, the fifth session of the UNEA (UNEA-5) was divided into two sessions (UNEA-5.1 and UNEA-5.2). UNEA 5.1 took place virtually February 22-23, 2021 and UNEA-5.2 will occur February 28-March 2, 2022. UNEA-5.1 focused primarily on urgent and procedural decisions. Substantive matters requiring further negotiation and debate are deferred until UNEA-5.2. UNEA-5 is focused upon Member States sharing their best practices for sustainability. UNEA-5 will help produce momentum for governments to rebuild better after the pandemic with green and sustainable recovery plans. It is important to rebuild with both green and sustainable recovery plans, without one or the other, the UN Sustainable Development Goals (SDGs) and the *2030 Agenda* will not be reached. The report of UNEA-5.1 has much useful information as to what countries have done during recent years to reach global goals.

The UNEA has a medium-term strategy (MTS) to stretch from 2022-2025 focusing on three crises which are: climate change, biodiversity loss, and pollution. UNEA plans to take action targeting the causes of these crises. The UNEA invites use of digital technologies to allow for inclusive, transparent, and innovative outcomes. Due to the interconnectedness of these three crises, the MTS focuses on seven interlinked subprogrammes to reach the goal. These programmes are Climate Action, Chemicals and Pollutions Action, Nature Action, Science Policy, Environmental Governance, Finance and Economic Transformations and Digital Transformations.

Conclusion

The UNEA is a very important body within the UN because it addresses issues of concern to all member states, and thus is integral to the future of humanity. The problems facing us in our work simulating this Assembly continue to grow and must be dealt with quickly. As the Assembly is now a universal body, it has the potential to obtain global consensus, even though this will be difficult to reach. We will address the reasons that the climate continues to change, flora and fauna continue to be lost, and pollution continues to worsen. If we can find solutions to these reasons you will make a great step towards solving the problem.

Annotated Bibliography

Stanley Johnson. UN Environment, The First 40 Years: A Narrative by Stanley Johnson (Nairobi: United Nations Office at Nairobi, 2012), 137-139.

This source helps explain what occurred during the Rio+20 and why the UNEP governing council became a universal body. It also helps explain what the purpose of the UNEA is.

UN General Assembly, Institutional and financial arrangements for international environmental co-operation (A/RES/2997(XXVII)), 1972.

This is the founding document of the UNEP and helps demonstrate the purpose, functions, structure, powers, and mandate of the Programme are. It will help give delegates a better insight into the formation of the original Programme and help them see what changes have occurred.

UNEA "Fifth session of the United Nations Environmental Assembly" Retrieved 22 July, 2021
https://www.unep.org/environmentassembly/unea5?_ga=2.106750659.1368518823.1626983766-173554347.1625151920.

This website helps describe to the delegates what is currently occurring with the UNEA and will give them direction for understanding the current issues that the organization faces.

UNEP “How is UNEP Funded” Retrieved 20 July, 2021 <https://www.unep.org/about-un-environment/funding-and-partnerships/funding-facts>.

This website from the UNEP will help show delegates that there are not unlimited resources and therefore remind them that their solutions must be frugal and respect the budgets set forth by the Programme.

UNEP “For people and planet: the UNEP strategy for 2022–2025” Retrieved 22 July, 2021 <https://www.unep.org/resources/policy-and-strategy/people-and-planet-unep-strategy-2022-2025>.

This site helps outline the current plans and trajectory of the Programme, and therefore an outline of what the delegates should be focusing on for their innovative solutions.

United Nations Environment Management Group. “About EMG.” Retrieved at <https://unemg.org/about-emg/>.

This site helps explain a crucial arm of the UN that the UNEP is a part of, and one that should be focused on when writing resolutions. Co-ordination with the EMG is very important for any resolution to be successful.

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I. Increasing the Safe Use of Nuclear Energy

“peaceful uses of nuclear science and technology, [Contribute] to international peace and security and the United Nations' Sustainable Development Goals”

— International Atomic Energy Agency (IAEA) overview statement

Introduction

It has been stated that “The UN and the nuclear age were born almost simultaneously.” Atomic energy was rightly seen as a major threat to the world, and there was little to no international view of a positive use of atomic energy until U.S.A. President Dwight D. Eisenhower addressed the UN about “Atoms for Peace” in 1953. This address later led to the founding of the International Atomic Energy Agency (IAEA) in 1957 leading to an era in which atomic energy has been used to improve peoples livelihoods while producing no carbon emissions.

Global warming and the subsequent climate change is an immediate threat to humanity and all life on Earth. In 2018, the Intergovernmental Panel on Climate Change (IPCC) detailed that a global temperature increase of 1.5° C will occur by 2040. The IPCC predicts that such an increase will cause rising sea levels, food shortages, and wildfires. Much of these predicted effects can already be seen to some extent in 2021, but the catastrophes will only continue to worsen if global warming is not stopped soon. When greenhouse gases (GHGs), such as carbon dioxide (CO₂), are released into the atmosphere, they create a greenhouse effect. By allowing heat from the sun to enter the Earth but not allowing heat to exit the Earth, the Earth’s temperature increases. About one tonne of natural uranium, between 20,000 to 400,000 tonnes of uranium ore, produces more energy than the burning of 20,000 tonnes of coal or 8.5 million cubic meters of gas.

As of 31 December 2018, 30 countries worldwide operated 451 nuclear reactors for the purpose of electricity generation and another 55 were under construction. As of the same date, 13 countries relied upon nuclear energy to make up over a quarter of their total electricity while France, Slovakia, and Ukraine’s nuclear power made up over half of their energy production. Globally, nuclear power makes up about 10.1% of global energy generation, the second highest low-carbon energy generation type

after hydro-electric generation which produces 16.9% of global energy generation. Although nuclear energy produces a significant amount of global energy, fear has caused production of new plants to decline to almost zero. In 1989, the global operating reactor count reached 420, which means that in the 31 years since, we have added an average of one reactor each year, compared to the 420 created in the first 38 years after the first was creating, averaging over 11 new reactors each year.

The energy production sector is the highest contributor of global carbon emissions, making up 25% of the emissions. Although there are other sectors that also produce large amounts of carbon emissions, as the largest producer and likely the simplest to change, it is a very important sector to focus on. Based on this data, if global nuclear energy production were to double, replacing carbon emitting energy plants, and all other emissions remained constant, global emissions would decrease by about 4% which is a significant amount.

Although use of nuclear energy is essential in the future of the climate and energy, it is crucial to ensure that all new nuclear programs are safe and secure. Unregulated and unmaintained plants can lead to radiation leaks and possibly major disasters such as the Chernobyl disaster in 1986. Well run and maintained reactors rarely have radiation leaks, and are fully safe. A 9.0 magnitude earthquake and tsunami were required to damage Japan's Fukushima reactor, only one of Japan's 54 reactors at the time. and further safety measures have been taken since then to help ensure a similar event does not cause similar damage in the future. Nuclear energy is generally very safe, but it is very important that they be monitored and ensured to be safe. Nuclear plants can also be secret locations for nuclear weapons programs, which are internationally unallowed under the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

International and Regional Framework

The International Atomic Energy Agency (IAEA) is the main intergovernmental forum for nuclear scientific and technical co-operation in the world. The IAEA, upon request, often provides support and guidance to countries on how to establish a nuclear energy program in line with internationally recognized safety and security standards. The agency also helps countries new to nuclear energy technology to build infrastructure necessary to paving the way to sustainable energy. The agency goes further by providing technical support for all aspects of the life cycle of nuclear fuel and facilities while also supporting new emerging technologies. Another role of the IAEA is the inspection of reactors to ensure that nuclear material is used solely for peaceful purposes. The IAEA was responsible for uncovering and eliminating the nuclear weapons program and capability of Iraq in 2003. The IAEA is integral towards furthering nuclear energy both in countries new to the energy type and those who have used it for decades before.

The NPT began gathering signatures in 1968 and entered into force in 1970. Its purpose is to prevent spread of nuclear weapons, encourage nuclear disarmament, and promote cooperation in peaceful use of nuclear energy. The IAEA is the agency that verifies compliance in all 191 signatories to the treaty. The NPT also promotes equal access to peaceful nuclear technology to all States parties. Some countries and companies have reached out to developing countries offering to help develop nuclear energy programs. Russia is the leader of these groups assisting other countries as 20 reactors are either confirmed or planned for export and by having agreements with another 27 countries yet to begin construction.

The UNEP and the IAEA in November 2014 signed a practical agreement guiding the collaboration of the two UN bodies. The purpose of the agreement is focused in the following areas: climate change,

ecosystem management, resource efficiency and sustainable production and consumption, Hazardous substances, waste management and disposal; and environmental policy.

Three international regions make up the largest gaps of current nuclear energy and reactors. They are the Middle East in Asia, Africa, and Central and South America. These regions account for a total of nine nuclear reactors with 3 in Brazil, two in Argentina, two in South Africa, one in Iran, and one in the United Arab Emirates (UAE). Another four reactors are under construction throughout the three regions, all four in the Middle East. Some issues in introducing more nuclear energy to these regions include financing projects, power grid capabilities, and public opinion. Nuclear power plants are extremely expensive with costs reaching billions of USD in most cases.

The problem with power grids is a very commonly forgotten issue. Nuclear reactors tend to produce significantly more energy than other energy generation plants such as coal fire plants. It is general practice to not have more than 10% of an electrical grid's capacity so that if removed for any reason, it does not cause major electrical shortages. This poses an issue for electrical grids that do not have enough capacity to support nuclear reactors which produce major amounts of power. One solution to this is being attempted in the UAE by attaching a total of four reactors, only one is currently completed and operating, to six countries shared electrical grid.

The UNEA has yet to make any substantial statements supporting nuclear energy. The UNEA seems to be mainly worried about the effects of radiation leaks and the effects on the environment, which should be a focal point of debate. It is important that any resolution from the UNEA in support of nuclear energy ensures that it is safe use that does not cause any damage to the environment nor human life in the region.

Global climate change due to pollution is a global problem, and requires great attention from every Member State as well as increased global cooperation. It is not enough for just a few countries to have a majority of its energy to come from nuclear energy such as in France, Slovakia, and Ukraine. The UNEA can work with the key stakeholders to produce global progress towards zero emissions. The IAEA has identified ways in which nuclear energy can help Member States to reach nine of the SDGs, including five that the UNEA is also focused on. The five SDGs are SDG 6, clean water and sanitation, SDG 7 affordable and clean energy, SDG 13, climate action, SDG 14, life below water, and SDG 15 life on land.

Tackling fears

One of the greatest problems that face Member States in starting or developing nuclear energy programs is public opinion and the fears the public has of the destructive power of radiation. According to the International Nuclear Event Scale, a scale developed by the IAEA to measure the severity of nuclear incidents, since the Chernobyl melt down in 1986, only five events have occurred rated as a serious incident or worse, and only the Fukushima Japan event in 2011 caused death outside of reactor workers.

The Chernobyl event was a major catastrophe, but it led to stricter safety protocols in reactors worldwide, and in the 34 years since, only one major event has occurred, 25 years later. The damage to the environment and world from fossil fuels causes much more damage than these extremely rare disasters. Even Ukraine, where Chernobyl is located and having made necessary changes, has continued to embrace nuclear energy reaching 15 reactors in operation and another two under construction now.

After the Fukushima major event in Japan, the major focus on nuclear energy was put under review and several reactors were shut down to be reviewed, but was ultimately decided to remain a national strategic priority. Since then, ten of the shutdown reactors have been restarted and another 16 are in

the process of being approved to be restarted. Since 2017, the point of lowest support from Japanese public since shut down reactors began to be restarted in 2015, support for nuclear energy has in Japanese public has almost doubled as the fears have begun to subside. It is important to be able to educate global citizens so that they understand the benefits, risks, and safety protocols of nuclear energy.

Negative effects on the environment

The nuclear fuel cycle is the cycle which is used to produce nuclear energy. It begins with the mining of uranium ore. An increasingly popular form of mining the ore is by circulating oxygenated water through porous ore to bring the uranium oxide to the surface. This process is much safer and environmentally friendly than surface or underground mining. The next step is milling, where the ore, or uranium oxide, is separated from other minerals to form uranium oxide concentrate which is about 80% uranium compared to the typical .1% in the ore. The tailings, the removed non-concentrate pieces, must be stored far from the environment as they are the most radioactive parts of the ore. The next step separates the two types of uranium, U-235 and U-238 as only U-235 creates the energy. The concentrates tend to be .7% U-235, and 99.3% U-238, but most reactors require a minimum of 3.5% U-235, known as low-enriched uranium. The low-enriched uranium is then formed into shape, finally ready to be used to create clean energy. After the U-235 has been used to create energy, it becomes either plutonium, or nuclear waste. Plutonium can be used again like U-235, but also then becomes nuclear waste which is radioactive. If reprocessed correctly, a portion can be recycled and reused, but remnants must be stored, generally 500 meters underground.

Although the energy from the low-enriched uranium is free of GHGs, the production of low-enriched uranium indirectly causes greenhouse gases via processes such as mining equipment using gasoline to power the vehicles. Additionally, the construction of reactors produces high levels of GHGs as concrete is a main component of the structures. Stored nuclear waste can also cause issues should any container be damaged or should bad actors attempt to steal the radioactive material. Should nuclear waste be released on the environment, issues would surely occur due to the radiation.

Although the production of nuclear energy does produce GHGs indirectly, they are considered negligible when compared to fossil fuel energy. Although considered negligible, it may be worth looking into processes to decrease the indirect GHGs so as to ensure greater benefit from nuclear energy.

Conclusion

There are likely several reasons why the UNEA has not yet focused on nuclear energy. The great cost of reactors, greater than that of an entire annual budget of the UNEP, the public view of nuclear energy, and the possible negative effects that could occur to the environment in the case of incidents. Despite all these reasons to avoid the subject, nuclear energy certainly plays a major role in the future of energy, and it is imperative that the UNEA make efforts to increase the safe use of nuclear energy. Resolutions should include ways in which the Assembly can help promote safe use of nuclear energy throughout the world, while also helping address concerns of the public. Feel free to search for other agencies within the UN that would be beneficial to partner with and to find ways to partner with said agencies. Remember as well that the UNEA has a budget, therefore innovative ideas should be cost effective, and low-cost.

Questions to Consider

1. What can be done to promote nuclear access in countries with low economic capabilities?

2. How can nuclear access be fostered in regions with low power grid capabilities?
3. How should popular opinion and views involving nuclear energy be addressed to advance nuclear power generation?
4. What recommendations or policy outcomes could the UNEA address in the above questions?

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This article and subsequent sites with it can help delegates better understand the greater impacts that nuclear energy can have reaching the goals that the UNEA and UNEP have set. It is very clear and can also help delegates develop innovative solutions.

IAEA “Overview” retrieved 22 July, 2021 <https://www.iaea.org/about/overview>.

Delegates should use the IAEA website to further understand what the agency does and how it may be involved with resolutions.

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This site helps explain the progress of difficulties for countries to develop nuclear energy programs. It outlines the specifics of many countries and is very clear and concise.

World Nuclear Association “Nuclear Fuel Cycle Overview” retrieved 23 July, 2021 <https://world-nuclear.org/information-library/nuclear-fuel-cycle/introduction/nuclear-fuel-cycle-overview.aspx>.

This article outlines the life cycle of nuclear fuel and explains how nuclear energy produces energy while producing no direct carbon emissions, but while producing nuclear waste.

World Nuclear Association “Nuclear Power in the World Today” retrieved 22 July, 2021

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II. The Role of Fossil Fuels in a Sustainable Energy System

“The need to reduce emission does not preclude the use of fossil fuels, but it does require a significant change in direction”

— Scott Foster, Director of the Sustainable Energy Division at the United Nations Economic Commission for Europe

Introduction

Fossil fuel burning leads to GHG production, and therefore global warming and climate change. Decreasing and eliminating use of fossil fuels wherever possible is a major need to reduce GHG emissions and to stop global climate change. Ideally, elimination of fossil fuels in every aspect of human life would be most ideal, but fossil fuels will continue to play a role in the foreseeable future as their use

cannot be eliminated in a single UN session. The role of this topic is to explore in what areas can they be eliminated, and which areas can they only be decreased. Global GHG emissions by sector are 25% from electricity and heat production, 24% from agriculture, forestry, and other land use; 21% from industry, 14% from transportation, 6% from buildings, and 10% from other energy.

Electricity and heat production is the direct GHG emissions produced by the production of electricity and heat at energy plants, whereas the 10% from other energy represents the emissions that the energy sector produces indirectly such as fuel extraction, refinement, and transportation. The GHG emissions from buildings represents the GHG emitted from a building such as onsite energy production, and burning fuels for the purpose of heating and cooking.

Energy Sector

According to the world bank, in 2015, fossil fuels made up just under 80% of global energy, which is only a 1% decrease since 1990. Although non-fossil fuel based energy has become more common in recent decades, it is primarily only in developed countries whereas developing countries are now using more energy, which tends to be from fossil fuels. One positive note is that as of 2015, natural gas energy represents 8% more of all energy production since 1990. Natural gas emits about half the GHGs as coal when used to produce energy, which means that even though fossil fuel use has decreased by negligible amounts, the GHG emissions from the fossil fuels has decreased. Although natural gas produces less GHGs, it still has other issues that come with it such as GHG emissions from leaks in pipelines. For these reasons, natural gas has become a popular medium term solution to reducing GHG emissions within the energy sector, but it should not be considered a permanent solution.

The energy sector is likely the sector that is easiest to eliminate use of fossil fuels, which is why it has been the focus of most work to reduce GHG emissions globally. The use of nuclear energy was discussed within topic one. Renewable energy such as solar, wind, and hydroelectric energy are sources of energy that do not directly produce GHGs. Hydroelectric power has long been the leader in renewable energy, but recent advances in technology in the wind and solar sector have increased use of these other forms of renewable energy. 2020 marked the first year in which The United States of America, the second highest emitter of CO₂, produced more energy from renewable energy than from coal, which has historically been the major source of the countries energy production. Despite the recent advances in cost reduction, renewable energy still tends to only be viable on a large scale for developed countries. In addition to cost, renewable sources of energy cannot always be relied upon as the wind does not always blow on wind turbines, and the sun is not always shining on solar panels. Energy storage options are beginning to help in this category, but are still expensive and new.

It is unlikely that the energy sector will ever be free of fossil fuel use, but carbon capture, utilization and storage (CCUS) systems are another form to mitigate their GHG emissions. CCUS systems are designed to capture and store CO₂ gas produced by energy generation to ensure it does not enter the atmosphere, in essence neutralizing the emissions. Once the carbon is captured, it is then transported either to be reused to create valuable products, or it is stored deep underground in geological formations. It is expected that one day, CCUS will also be used to remove carbon from an ecosystem either from bio-based processes or directly from the atmosphere. As of 2020, CCUS facilities captured 40 million tonnes of carbon each year, and if all currently planned CCUS facility projects are completed, this number will be about 130 million tonnes annually.

Agriculture and deforestation

The agriculture sector is rarely seen as a being a major emitter of GHGs, but it is the second most largest sector. Much of this come from the cultivation of crops and the maintenance of livestock. Management

practices for enriching and maintaining rich soil releases nitrous oxide (N₂O) into the atmosphere representing more than 50% of GHG emissions within the agriculture sector. Livestock also produce methane as part of their digestive process which represents over 25% of agriculture's GHG productions. Manure management from livestock also leads to another 12% of the sector's GHG emissions. There are many other sources which produce much smaller amounts.

Deforestation also produces major amounts of GHG emissions. Much of deforestation occurs as the land is transformed into agricultural use. Deforestation produces GHG because trees store large amounts of carbon, but so does the biomass that surrounds them including the soil. As lands are deforested, they lose the capability to maintain the carbon storage and release significant amounts of carbon into the air. Forests are very important to combatting climate change, especially as they store double the amount of carbon that is in the Earth's atmosphere. When removed, more carbon is introduced to the atmosphere while simultaneously decreasing their storage capacity.

While agriculture and deforestation produce large amounts of GHGs, these GHGs are not from fossil fuels. The fossil fuels that are used towards this sector are used within the machinery that is used, which is generally included in either the industry or transport sectors. Although fossil fuels are not included in this category, it is important to understand that fossil fuels are not the only emitters, and that it is not possible to simply ban anything that produces emissions.

Industry

The industry sector is what produces goods and materials that are used every day. The emissions within this sector tend to be divided into two categories, direct and indirect. These emissions come from burning fuels, for energy or heat, and from leaks in industrial processes or equipment. Indirect emissions come from the use of power plants that are dedicated to producing energy for the industry sector. Indirect emissions in the industry sector act much like the energy sector, and thus will not be touched on very deeply in this section. It is important to realize that energy creation for the industry sector does produce a large, although not half, of the emissions from the sector.

Direct emissions make up the majority of the industry sector's emissions, and do largely come from fossil fuels. About two thirds of direct emissions are from burning of fossil fuels within an industrial facility in order to produce its own, less expensive, energy for production. This allows industrial facilities to pollute the air without having to pay as much as most energy customers as the facility can afford its own source of energy. The other third of direct emissions come from leaks of natural gas or petroleum systems, and from chemical reactions used to create iron, steel, and cement.

Industry is a very important, energy reliant sector. People around the world rely on the products they receive from industries on a daily basis, and thus the sector cannot change in a single day. Fossil fuels play a major role in the sector today, but such a heavy reliance may not be very necessary in the future. It is important that the removal of fossil fuels from the industry sector does not negatively impact progress towards other SDGs. Innovative solutions will be necessary towards helping in this sector, such as finding ways to implement more CCUS systems into the industry.

Transportation

The transportation industry is a major user of fossil fuels. From cars, to planes, to boats, almost any form of mechanical transportation uses fossil fuels and adds to emissions. During the global pandemic in 2020, travel decreased dramatically all across the world. The decrease in transportation use led to a 3% decrease in global emissions. Electric vehicles, the form of transportation that does not require fossil fuels, are slowly becoming more common. Despite being more common, they are more expensive than their fossil fuel counterparts which hinders the progress towards decreasing fossil fuel use. Hybrid

vehicles decrease use of fossil fuels greatly, without directly eliminating them. They are more less expensive than their fully electric counterparts, and decrease emissions. Since a majority of high emitting vehicles are older vehicles owned by people or companies without the means to purchase more efficient vehicles, let alone electric vehicles, many governments and thought leaders are now suggesting to focus on mass use of hybrid vehicles in the short term rather than electric as it is more likely to be cost effective for those who leave the largest carbon footprint with their vehicles.

As electricity is not used to propel an aircraft, air travel does not currently have a viable option to eliminate fossil fuels. At the moment, air travel is a very clear sector in which fossil fuels will likely continue to be common use in the future. More efficient forms of air travel are being discovered annually, but there is yet to be a form that does not use fossil fuels. The budding space travel industry faces the same problem.

The most effective means at the moment to decrease fossil fuel use within ground transportation is to reduce individual use of fossil fuel-based transportation, as seen in 2020. Seeing the effects of the pandemic on the way people work remotely, Inger Andersen, the Executive Director of the UNEP said, “as a leader in the UN, we travel too much... it has a terrible carbon footprint... we need to rethink travelling.” Over the past year, the world has seen that we can stay connected, even if not in person. Although personal connections are very important, as Inger Andersen said, “we need to rethink travelling.” Is the carbon produced for a trip truly necessary, or is there a better way to accomplish what is desired?

Buildings

Buildings produce carbon emissions when they burn fossil fuels either for energy, or for heating and cooking. Most of this comes use of natural gas, coal, or even firewood. Although wood is not considered a fossil fuel, it does produce even more GHGs than its fossil fuel counterparts, up to 30% more than coal or even 150% more than natural gas. Some governments, such as the United States of America’s State of Utah has initiated program to replace wood-based stoves and heating sources with more efficient appliances. Utah also has some restrictions on burning wood inside of homes, especially on days of bad air-quality, which over 20 years has seen a reduction of about 75%.

Global Carbon Capture, Utilization and Storage Systems

CCUS systems have not yet received much global support. Much focus from the UN with regards to the technology comes from within the UN bodies focused on Europe, especially the United Nations Economic Commission for Europe (UNECE) which produces most of the UN’s reports on the technology. In 2014 the UNECE adopted recommendations to be made to the Paris Climate Conference in 2015, but these recommendations were not focused upon during the conference. Again in March 2021, the UNECE published another brief outlining the importance of the technology. This new brief was published soon after the UN Secretary General’s message in which he called upon private companies and governments to “end the deadly addiction to coal.” This timing shows that not everyone understands the role of fossil fuels in a sustainable environment. The brief represents the change in direction as described by Scott Foster as opposed to the complete elimination strategy that is more common in the world. During the Paris Conference, only 10 countries recognized explicitly CCUS as a technology to reduce emissions.

CCUS systems are a slowly emerging way to combat climate change and to accept that fossil fuels play a role in the future of sustainable energy. Even without much policy giving strong support to CCUS systems, it is still responsible for 40 million tonnes of annual carbon removal from the atmosphere, and can soon reach 130 million tonnes of annual carbon removal. If this much progress can be made without strong government support, the amount of progress in the technology and systems would be very

significant should governmental bodies provide more support to the technology and to companies and agencies that use fossil fuels.

Although the Assembly does not need to accept, promote, nor focus on CCUS, it is very important that the Assembly focus on each available solution, and the UN has thus far not focused much on the technology. The Assembly should look into the technology and at the least, consider the technology as a viable way to promote a better future. Should Member States and the Assembly decide not to focus on CCUS in the future, that is their decision and that of delegates, but it should not be ignored from even being given a debate.

Conclusion

There is not a foreseeable way to eliminate use of fossil fuels in the global pursuit of a sustainable environment, but as Scott Foster said, we “require a significant change in direction.” It is up to the delegates to continue to do further research to find ways in which direction can be changed. Even in areas in which the requirement for fossil fuel cannot be directly eliminated, as delegates to the UNEA, it is important to find ways to decrease the use of fossil fuels by making it more efficient, or through other innovative means. Be sure to remember the mandate of the UNEA, and that the creation of laws is not within the assembly’s mandate, but that providing guidance and assistance is.

The global environment is a global issue, and therefore it is very important to achieve true consensus in this session. As the development of policy or law may not be a major focus, it is important to help develop continuity within Member State policies and guidelines. The role of fossil fuels in a sustainable energy system will change with new technological developments, but with thorough work, the assembly can develop a substantial basis for determining what their role is. Be sure to look at short-term, medium-term, and long-term roles as well.

Annotated Bibliography

IEA “Carbon Capture, Utilisation and storage” retrieved 5 August, 2021 <https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage>.

Delegates should use this article to better understand CCUS. By better understanding CCUS delegates will be able to better structure plans, position papers, and resolutions to involve and promote CCUS.

UN “Forests and Climate Change: From Complex Problem to Integrated Solution” retrieved 5 August, 2021 <https://www.un.org/en/chronicle/article/forests-and-climate-change-complex-problem-integrated-solution>.

Delegates should use this article to better understand the complex role that forest play in both helping prevent global climate change, and helping to produce global climate change.

UN “The Role of Fossil Fuels in a Sustainable Energy System” retrieved 5 August, 2021 <https://www.un.org/en/chronicle/article/role-fossil-fuels-sustainable-energy-system>.

Delegates should use this source to better understand where some UN officials stand on the issue of fossil fuels in the future. It is one of few cases in which UN members and officials have made an official statement on the matter.

UN “UN report calls for scaling-up carbon capture, use and storage” retrieved 6 August, 2021 <https://news.un.org/en/story/2021/03/1086312>.

This source can help delegates better understand what the most recent major studies on CCUS are and what the next focuses are. It also outlines more information about storage and the future of storage.

UNECE “UNECE member States adopt recommendations on Carbon Capture and Storage on the road to the Paris Climate Conference” retrieved 6 August, 2021 <https://unece.org/sustainable-energy/press/unece-member-states-adopt-recommendations-carbon-capture-and-storage-road>.

Delegates should use this source to better understand the technology of CCUS and more importantly, the recommendations of the UNECE and the information that the body has with regards to the future and effectiveness of the technology. The report explains what areas of the technology should be the focus.

USEPA “Global Greenhouse Gas Emissions Data” retrieved 22 July, 2021 <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>.

This website details what the different sectors are that contribute to large amounts of GHGs. Although it is an agency of the United States of America, its data for international and global trends is largely based on the International Panel on Climate Change, which it simplifies, further explains, and illustrates in very clear ways. It also lays out ways in which emissions from each sector can be decreased.

USEIA “Natural Gas Explained” retrieved 5 August, 2021, <https://www.eia.gov/energyexplained/natural-gas/natural-gas-and-the-environment.php>.

Delegates should utilize this source to better understand the benefits and also dangers of natural gas. Natural gas could be a major source of cleaner energy while dirtier energy forms such as coal are reduced, it should be well understood.

The World Bank “Fossil fuel energy consumption (% of total)” retrieved 5 August, 2021, <https://data.worldbank.org/indicator/EG.USE.COMM.FO.ZS>.

Delegates should use the World Bank site to find additional statistics that could prove useful in the future and for resolution writing.

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Phys Org “Study shows restrictions on wood burning in Utah dramatically improve air quality” retrieved 6 August, 2021 <https://phys.org/news/2020-02-restrictions-wood-utah-air-quality.html>.

UN “Awake at Night” retrieved 6 August, 2021 <https://www.un.org/en/awake-at-night/S3-E17-you-can-put-things-right>.

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