

United Nations Environment Programme (UNEP)



Chair: Chloe Lanspeary

Co-Chair: Audrey Gutierrez

Vice Chair: Emerson Easley



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Position List



Letter from the Chair

Hi Delegates!

Welcome to LYMUN XI! My name is Chloe Lanspeary, and I am delighted to be your chair for the United Nations Environment Programme (UNEP)! I am looking forward to meeting everyone and having a dynamic and exciting committee.

I am currently a senior at Lyons Township High School, and this is my third year of Model UN. I am also involved in many other clubs such as Congressional Debate and Scholastic Bowl. I am extremely passionate about politics and international relations. I am a member of the League of Women Voters and I participate in growing the number of young voters in my area. I also play piano and viola.

I am a co-founder of an international non-profit organization called United Student Media. We publish articles about domestic and international issues written by our members from across the world. Our goal is to provide unbiased media coverage of these issues, as well as to help educate young people across the globe about these important issues.

I am fascinated by UNEP, and am excited about the topics that are going to be discussed. In this committee we will be discussing two topics: destruction of habitats and the growing energy sector. The topics are extremely important and also vast, with many different considerations and pathways, making for an exciting committee and allowing for focus on each country's stance on the topics. As a reminder, I would prefer to have unique clauses in working papers. Plagiarism and prewriting is absolutely unacceptable.

Lastly, I would like to remind you all that LYMUN XI is a learning conference. This conference is an opportunity to learn more about MUN and foreign affairs. Please use this conference, and this committee as an opportunity to learn and strengthen your abilities as a delegate. You may submit your position papers to either of these emails by **the day before** the

conference at **11:59**, or may submit a physical copy by the **beginning** of the conference.

Submission of two position papers (one for each topic) is required for eligibility of awards. A reminder that LYMUN is a no tech conference. I am looking forward to meeting you all and having a great committee!

Best,

Chloe Lanspeary

Letter from the Co-Chair

Hi Delegates!

Welcome to LYMUN XI! My name is Audrey Gutierrez, and I am honored to be your co-chair for the United Nations Environment Programme (UNEP) committee! I am looking forward to meeting everyone and having a diverse and exciting committee.

I am currently a junior at Lyons Township High School, and this is my second year at LYMUN and my third year of Model UN. Last year, I was a vice chair for SOCHUM and I am so ecstatic to be the co-chair for UNEP!

Outside of MUN, I am also involved in other clubs such as Peer Leadership, Class Board, Operation Snowball, Hispanic Leadership Council, and many others. I am extremely passionate about politics, business, international relations, and aviation. I am also a part of high school Democrats of America and spent my summer volunteering for the Democratic National Convention.

To reiterate Chloe, I am fascinated by UNEP, and am excited about the topics that are going to be discussed. In this committee, we will be discussing two topics: destruction of habitats and the growing energy sector. The topics are extremely important and also vast, with many different considerations and pathways - making for an exciting committee, and allowing for focus on each country's stance on the topics. As a reminder, I would prefer to have unique clauses in working papers. Plagiarism and prewriting is absolutely unacceptable.

Lastly, I would like to remind you all that LYMUN XI is a learning conference. This conference is an opportunity to learn more about MUN, and foreign affairs. Please use this conference, and this committee as an opportunity to learn and strengthen your abilities as a delegate. Please do not hesitate to ask any questions, before, during or after the conference. I can be reached at my email gut514092@d204.lths.net or audrey.e.g.312@gmail.com You may

submit your position papers to either of these emails by **the day before** the conference at **11:59**, or may submit a physical copy by the **beginning** of the conference. Submission of two position papers (one for each topic) is required for eligibility of awards. A reminder that LYMUN is a no tech conference. I am looking forward to meeting you all and having a great committee!

Lots of love,

Audrey Gutierrez

Committee Background

The United Nations Environment Programme was founded in 1972 after the landmark United Nations Conference on the Human Environment, intended to monitor the environment, utilize science to coordinate policy efforts, and respond to the world's environmental challenges. Since its inception, the United Nations Environment Programme has worked tirelessly to coordinate actions on global environmental issues.

One of the first accomplishments of the United Nations Environment Programme includes the Convention for the Prevention of Pollution from Ships in 1973. This convention displayed how the UNEP could both regulate pollution, but also coordinate with other UN committees and governments to mitigate marine pollution.

As of right now, the United Nations Environment Programme is led by Inger Anderson, the Under-Secretary General of the United Nations and Executive Director of the United Nations Environmental Programme. She has been the executive director since 2019, after previously serving as the director general of the International Union for the Conservation of Nature (IUCN).

As of right now, the United Nations Environmental Programme is currently headquartered in Nairobi, Kenya on a former coffee farm. It is one of two UN programmes headquartered in a developing country. UNEP also has regional offices in Africa, Asia, Europe, Latin America, North America, and West Asia, and 12 sub-regional and programme offices in the world. UNEP has successfully implemented projects in over 160 countries, and is currently supporting over 400 projects around the globe.

Topic A: Destruction of Habitats and Ecosystems

Destruction of habitats comes in a variety of forms. From state to state, each nation faces a different variation of habitat destruction. Habitat destruction can include island fragmentation or sinking, making land inhabitable, changes in global weather patterns, and more. It is therefore imperative that each position considers what form of habitat destruction they face.



The United Nations Environment Programme has identified 5 key points of destruction of habitat, and the Earth as a whole. These include invasive species, changes in land and sea use, climate change, pollution, and direct exploitation of natural resources. The United Nations Environment Programme's ultimate goal is to ensure the long term health and sustainability of the planet. Therefore, it is important to recognize not just what will solve the current crises, but also ensuring that these crises not just do not happen again, but building back up what the crises caused for the long term sustainability and prevention of the planet.

Topic Background: Invasive Species

Invasive Alien Species (IAS) includes plants, animals, fungi, and microorganisms that have entered and established themselves in an environment that is not a part of their natural habitat. Invasive alien species have contributed to the decline and extinction of native species, negatively impacting ecosystems. Invasive species have contributed to nearly 40% of all animal extinctions in the world since the 17th century. They also have a large impact on the economy,

where environmental losses in Australia, the United States, Brazil, India, South Africa, and the United Kingdom are estimated to cost over \$100 billion USD annually.

Invasive alien species can permanently alter the food web of an ecosystem by destroying native food sources. They do this because they are typically considered **generalist species**, which means that they have a large range of ecological tolerance, and can survive on a wide variety of food sources. Thus, they can easily eat the food sources for **specialist species**, who have a small range of ecological tolerance, and only eat a small variety of foods. Thus, they can destroy necessary food and habitats for specialist native species, leading to endangerment and later extinction. Thus, invasive alien species can contribute to destruction of habitat for many species, particularly if they outcompete the native, specialist species.

Topic Background: Changes in Land and Sea Use

The United Nations Environmental Programme deems that the biggest driver of lack of diversity is due to how humans use the land and the sea. Human uses include conservation of land, such as forest and wetlands, and also urban development. While the United Nations Environmental Programme has put in place many global initiatives to promote sustainable human uses of the land and the sea, there is still destruction imminent.

Since 1990, around 420 million hectares of forest have been lost due to conversion to other land uses. The main driver of deforestation is the agriculture sector, particularly through a practice called **clear-cutting**. Agriculture, as a result of **monoculture**, causes nutrient deficient soil, removes native species from the area, and causes a loss of habitat and biodiversity in the area.

Urbanization is also a leading cause of habitat destruction, particularly due to leaching of pollutants and destruction of habitats on coastlines. For instance, urbanization on beaches, while accommodating tourism, can destroy wetlands and marshes. Wetlands and marshes are extremely important for the environment as they help water quality, provide wildlife habitat, maintain productivity, and reduce storm damage. In particular, wetlands serve as a habitat for over 900 species in the United States alone.

In regards to marine life, there are a variety of harmful fishing practices that can destroy habitats. One of the most common is **ocean trawling**, which is where fishermen drag a net across the bottom of the ocean to get fish. However, this drags up habitats at the bottom of the ocean, and disrupts ecosystems, leading to habitat loss and destruction. Other harmful fishing practices can include **overfishing**, and **cyanide fishing**.

In regards to agriculture, harmful agricultural practices can include overutilization of fertilizer. The issue with overusing fertilizer is that it can lead to a process known as **eutrophication**, which is where there is runoff of fertilizer into ponds and other areas, which causes algae blooms. However, when these algae blooms die, the bacteria that consume all of the algae use up all the oxygen in the area, leading to **hypoxia**, or a dead zone. This dead zone means that other marine life can not inhabit the area, thus leading to habitat and ecosystem destruction.

Topic Background: Climate Change

Climate change has been brought on by a variety of factors, including carbon emissions, overpopulation, and more. But it has caused infinite amounts of destruction to the environment, and to habitats. Yet, the United Nations Environmental Programme has worked tirelessly to

mitigate the effects, including with the enforcement of the Montreal Protocol. By enforcing the Montreal Protocol, the United Nations Environmental Programme has helped mitigate ozone depletion, and chlorofluorocarbon emissions.

Since 1980, global greenhouse gas emissions have doubled, raising global temperatures by an average of .7 degrees Celsius annually. The most vulnerable ecosystems harmed by climate change are: coral reefs, mountains, and polar ecosystems. In fact climate change threatens 1 in 6 species around the world.

Habitats and ecosystems serve as an important aspect of mitigating the effects of climate change and carbon emissions. Wetlands, peatlands, and forests are carbon reservoirs, which means that they store large amounts of carbon that is released into the atmosphere. However, climate change has led to the destruction of many of these ecosystems.

Due to rising global temperatures because of an increase in greenhouse gasses in the atmosphere, this has caused a rising ocean temperature. Rising ocean temperatures have caused melting of ice glaciers which has led to rising sea levels. Rising sea levels have contributed to the destruction of habitats such as wetlands and marshes, and has also caused many islands to begin sinking. On top of rising sea levels, rising ocean temperatures have also caused a decrease in dissolved oxygen levels. Higher temperature water means that the water can hold less dissolved oxygen, which is required for marine life to survive.

An increase of carbon in the atmosphere has also led to **ocean acidification**, which has contributed to destruction of coral reefs, a habitat for over 1 million different marine species, and a large carbon reservoir. Coral reefs can also face **coral bleaching**, causing most species of coral to die, and not be able to return to the area, permanently destroying the ecosystem and habitat for millions of species in the world.

Climate change also contributes to an increase in the frequency and extremity of weather events. These weather events can include an increase in precipitation, more hurricanes, tornadoes, flooding, and more. With an increase in extreme weather, particularly flooding, habitats are more susceptible to destruction, particularly key pieces of ecosystems, and can lead to **habitat fragmentation**. Habitat fragmentation can lead to a loss of habitat for many species, but also a decrease in species and genetic diversity in ecosystems, making many species more susceptible to disease, and therefore endangerment and extinction.

Topic Background: Pollution

Pollution, mainly from chemicals and waste, is a major driver of habitat and ecosystem destruction. Marine plastic pollution has increased tenfold since 1980, affecting at least 267 animal species, including 86% of marine turtles, 44% of seabirds, and 43% of marine mammals.

There has been a lack of plastic consumption regulation, as well as landfill regulations. Landfills, which are often unregulated and located in developing countries, contribute to pollution into the ocean, as there is no global containment policy. Thus plastic, and other contaminants, such as lead and mercury, and other heavy metals leach into the ocean, which causes many organisms to consume that pollution, leading to a loss of diversity within these ecosystems. On top of that, e-waste landfills can leach into the ocean heavy metals such as lead and mercury. But heavy metals can bioaccumulate, because they are stored in fat, so they can continue to grow extremely quickly within marine organisms. They can also biomagnify, which is where the heavy metals can travel up the food chain. By leaching of heavy metals into the food chain, habitats can be destroyed for many marine organisms because they lack a food source, and can also cause the entire habitat and ecosystem to become toxic. Landfills, not properly

protected, can also leach metals into soil, which can cause a destruction of usable soil for agriculture, and lead to destruction of habitat for many bacteria and plant organisms.

Topic Background: Direct Exploitation of Natural Resources

According to a new United Nations Environment Programme report, exploitation of natural resources, and unsustainable use of plants and animals does not just threaten the survival of ecosystems and habitats, but over 1 million species worldwide, and billions of people who rely on wild resources for food, infrastructure, fuel, and income.

The issue with how humans consume natural resources is that resources are consumed at a faster rate of regrowth of these resources, such as sequestered carbon, and wood. Many agricultural practices that contribute to the exploitation of natural



resources. Part of agriculture includes clearing forests for monoculture. Clearing forests can cause destruction of habitat and ecosystems for thousands of species, without considering the rate of growth for the forest. Many developing nations also rely on wood for infrastructure, and for fuel, leading to an increase in deforestation practices, which are harmful long term.

Agriculture also is one of the largest sectors contributing to carbon emissions due to a need for machinery, and the expansion of agricultural needs with a growing population.

Previous Solutions

The United Nations Environment Programme has worked diligently around the world to improve human practices, and promote sustainability for the sake of the environment, the planet, and the people. Many of these solutions have included a wide variety of protocols.

The United Nations Environment Programme currently enforces the Montreal Protocol on Substances that Deplete the Ozone Layer. The Montreal Protocol on Substances that Deplete the Ozone Layer was adopted on September 16, 1982, intended to halt the growing ozone hole in the atmosphere. Ozone serves as a protective barrier from UV rays from the sun, ensuring that the Earth's temperatures are regulated, and that species are safe from UV rays that can lead to cancer, and eventual death. The Montreal Protocol specifically regulates chlorofluorocarbons which depleted the ozone layer dramatically due to releasing a chlorine particle, which limited the production of ozone in the stratosphere, causing ozone holes to form at the poles of the earth. Thus, the UNEP has done immense work to regulate the ozone layer, which caused destruction of many habitats, because it caused a decrease of productivity in ecosystems, which caused the habitat to not be able to support as many species, thus leading to habitat and ecosystem destruction.

The United Nations Environmental Programme also successfully implemented CITES, the Convention on International Trade in Endangered Species of Wild Flora and Fauna. CITES ensures that trade of species does not threaten the species' survival, effectively regulating invasive species. By regulating invasive species, CITES has successfully decreased the amount of habitat destruction, and loss of species in ecosystems due to invasive species.

Among other solutions that have not been implemented globally are the conservation of wildlife habitats, such as wetlands. Restoring only 15% of ecosystems in priority areas improves

habitats, and cutting extinction rates by 60%. Other solutions include sustainable practices of human consumption, and limiting overconsumption of products that contribute to climate change and pollution. It can also include habitat corridors, connecting habitats that were previously split, to increase species and genetic diversity, protecting the long term growth of habitats and ecosystems.

Terms to Know

Terms	Definitions
Generalist Species	Species that is able to thrive in a wide variety of environmental conditions, and can make use of different resources
Specialist Species	Species that uses a relatively small proportion of available resources
Clear-Cutting	Practice of cutting down large amounts of trees from a forest at one time
Monoculture	Only growing one crop in a singular area, typically used in large scale agriculture
Ocean Trawling	Dragging a net at the bottom of the ocean to catch fish
Overfishing	Catching too many fish, which can lead to destruction of habitat
Cyanide Fishing	Using cyanide to poison fish, making them easier to catch
Eutrophication	Process of runoff from fertilizer causing algae blooms, eventually leading to them dying, and causing a dead zone
Hypoxia	An area with no oxygen, a dead zone
Ocean Acidification	Process where ocean takes in carbon dioxide, and bonds with calcium to halt production of calcium chloride leading to a decrease in

	available calcium for coral and shells
Coral Bleaching	Coral expel algae, leaving them very weak
Habitat Fragmentation	Habitats being split up, either by highways, or other human made transformations

Questions to Consider

1. What unsustainable practices does your country partake in?
2. How is your country affected by climate change?
3. What species are endangered in your country?
4. How has your country contributed to global initiatives protecting ecosystems?
5. How has your country helped protect and preserve habitats and ecosystems?

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Topic B: Growing a Sustainable Energy Sector

Energy is one of the most important things driving human development. As the human population continues to expand, demand for energy increases. And in recent times, it has increased exponentially. It is important to recognize that growing an energy sector means demands for the Earth's natural resources increases as well. And while Earth will continue to face some destruction due to energy demands, it is up to the United Nations Environment Programme to ensure that demand for energy does not come at the expense of the Earth and the environment's long term sustainability and protection.

Energy comes in a variety of forms depending on location, and stage of development for nations. Many developing countries do not have the money to afford renewable energy, but also are oftentimes exploited for their resources for sources of energy for developed nations. Developed nations grapple with the decision of spending more money on renewable energy, or staying in the non-renewable energy sector because it is cheaper, and helps stimulate the economy. Typically, energy sources are burned, which are used to heat up water, the water vapor created then goes to a turbine, then a generator, then producing electricity. The process can also be used for **cogeneration**. While there are a wide variety of different types of energy, the United Nations Environment Programme seeks to focus on what is most important: protecting the environment in the long term.

While the UNEP advocates for renewable energy, it is important to understand the feasibility of different types of energy based on the development level of the country. More often than not, many countries face the fact that they do not have the resources, money, or investment to support renewable energy.

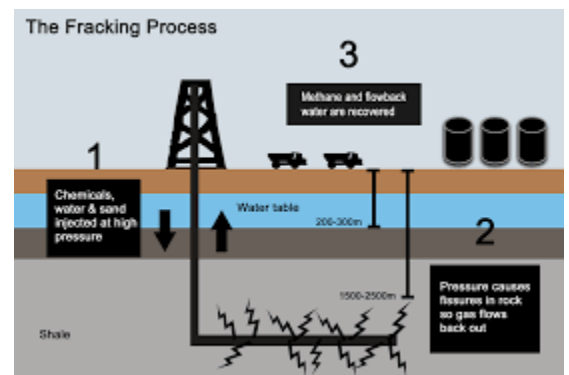
Non-Renewable Energy

A non renewable source of energy is using a natural resource at a rate faster than the Earth can replenish. There are many examples of these most common being: natural gas, oil, crude oil, coal, peat, biomass, and nuclear energy. Coal, natural gas, and oil are considered fossil fuels. Fossil fuels are types of energy that are formed from sequestered carbon in the ground. Plants and animals become fossil fuels during a time called the carboniferous period, around 300-360 million years ago. They eventually died, and were pressurized under layers of rock and sediment, which then over time created fossil fuels. When burnt for energy, fossil fuels release carbon into the atmosphere, contributing to climate change.

Coal and biomass energy is often used in developing nations as it is easy to access. Biomass is considered burning wood or **peat** for energy and heat. Biomass typically produces a large amount of **particulate matter (PM)** which can be dangerous for lungs, and for pollution as well. Coal is extremely dangerous as they can release sulfates, nitrates, **VOCs**, PM, methane, and CO₂. Sulfates and nitrates in particular are considered primary pollutants, but when combined with water vapor in the atmosphere can form **acid rain**. VOCs and nitrates also contribute **photochemical smog**.

Natural gas and oil are more commonly used in developed countries, as they require more money for infrastructure, extraction, and transportation.

Though there are benefits to using natural gas as opposed to coal. Natural gas, while producing a wide variety of pollutants, emits less than coal when burned. However, natural gas in pipelines can be particularly susceptible to pipeline bursts, which can be extremely harmful to the

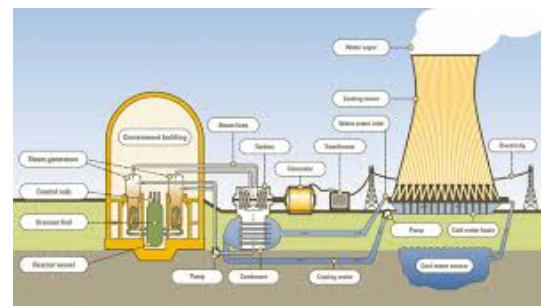


environment. Oil is a much more controversial non-renewable energy source. This is due to the various types of extraction processes. One of the most commonly used is **fracking**. Fracking can cause earthquakes, water contamination, and can disrupt land areas. Also commonly used is tar sands, which is where the oil is not within rocks and sediments, but rather combined with dirt and soil. This extraction process uses tons of water, and causes water pollution. It also is extremely energy inefficient due to the amount of effort needed for the extraction process.

Nuclear Energy

Nuclear energy is considered an ambiguous energy source. Some argue that it is a renewable energy source, however it fits better into the definition of a non-renewable energy source due to the fact that it requires Uranium-235 as a fuel source. Uranium-235 is a mineral that has to be mined, and is therefore a finite resource, making nuclear energy a non-renewable energy source. Nuclear energy has a similar process in regards to all energy processes, where uranium-235 is used to heat up water, which spins a turbine, then powers a generator, creating electricity.

However, uranium-235 is an extremely dangerous substance, and therefore requires an extreme amount of water to cool down the uranium-235 and keep from a nuclear meltdown (as seen in accidents like



Fukuyama, Chernobyl, and Three Mile Island). Not only are copious amounts of water that are taken away from **aquifers**, but also when the water is dumped back into a river, or a pond, at an extremely high temperature. High temperature water carries less dissolved oxygen, which means less organisms can survive in the area because oxygen levels decrease.

Renewable Energy

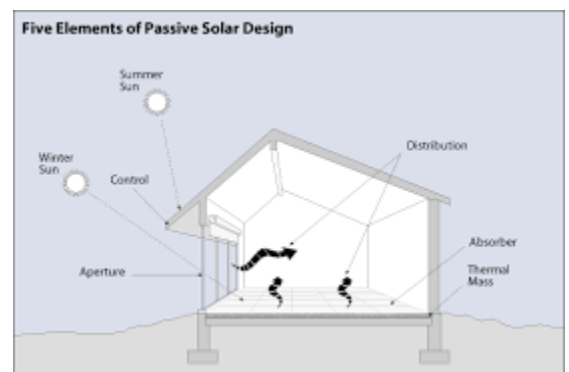
More than 760 million people around the world lack access to electricity. Yet, with the implementation of clean energy solutions, there can be an increase in improved healthcare, and healthcare access, better education, creation of new jobs, and an overall reduction of poverty.

Many examples of renewable energy include: wind, solar, geothermal, hydroelectric, and hydrogen fuel cells. While renewable energy has copious benefits for the environment, with less pollutants emitted, less waste created, and less destruction to find these resources. However, renewable energy has its drawbacks. Renewable energy can be expensive to implement, and can have a short term pitfall towards the country's economy. Renewable energy is also not able to be implemented everywhere. Wind energy cannot be implemented in a place with little wind, solar cannot be implemented in a place with no sun, and geothermal energy has to be placed by a tectonic plate border. There is also the struggle that many of these resources are not available daily. Not everyday is windy, not everyday is sunny, therefore renewable energy can vary in the amount of energy it produces daily.

In regards to wind energy, wind energy is typically used in farms. Wind energy requires large amounts of land, because of the wind turbines that are used. Of all renewable energy, wind is the second most invested, and has the second most growth, behind PV solar energy. By 2022, wind energy investments increased by 20%, with policy being the main supporter of producing and providing wind energy around the world. Wind energy, however, also faces its drawbacks due to the materials needed for its construction does require mining, and must be maintained and renewed every five to ten years.

In regards to solar energy, there are three types of solar energy: Photovoltaic (PV), active solar, and passive solar. Photovoltaic is by far the most popular type of solar energy, typically

characterized by solar panels. Solar panels use the UV rays from the sun to generate electricity via free flowing electrons. While solar panels and photovoltaic solar energy can be extremely beneficial to the environment, with less pollutants produced from solar panels. However, photovoltaic panels carry the same negative points as wind energy. That they require replacement and management which means that mining must take place. Another form of solar energy is called active solar. Active solar uses mirrors to concentrate sunlight to heat up water, which can be used for heat and/or electricity. Active solar, while less common, has its advantages in comparison to photovoltaic, because it requires less mining, and does not require as much frequent replacement. However, it does require much more land space, which means it can take up valuable land and space that can be used for other purposes, such as infrastructure and agriculture. Active solar energy also does not produce as much energy as photovoltaic solar energy, which means there is a need for large amounts of active solar energy to generate enough electricity and heat for a singular household. The other



type of solar energy is passive solar energy. Passive solar energy is when there are south facing windows (in the northern hemisphere) or north facing windows (in the southern hemisphere) that allow for sunlight to enter when the sun is lower (during the winter months) but also featured an overhang to block the sun from entering the home when it is high (during the summer months) to keep the home cool. The area is also typically made up of materials such as concrete, brick, stone, and tile to trap heat in the home, and is used solely to heat up homes. While passive solar does not require any replacement, maintenance or mining, it is still the least popular as it requires

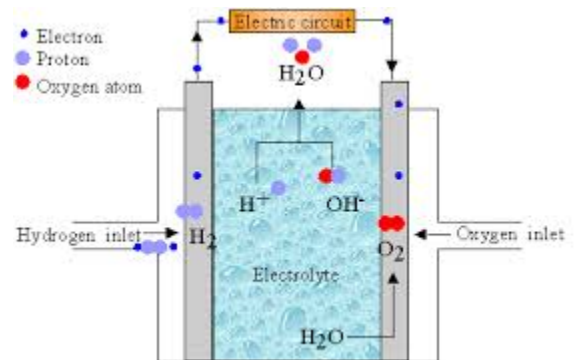
the most investment into infrastructure, which can be expensive, and not feasible for every environment, particularly for urban environments.

In regards to hydroelectric power, it also comes in a variety of forms: water impoundment, tidal energy, and river energy. Water impoundment is the 'typical' form of water energy, characterized by dams and reservoirs. The dams block off the flow of water, and build up the potential energy. Then they release small amounts of water creating kinetic energy. The kinetic energy then spins a turbine, powering a generator, and creating electricity. The issue with dams is that you need massive amounts of water to generate the necessary energy and electricity. They also do require mining of resources to create the dam. Dams also can harm many organisms living in the area, particularly fish such as salmon who travel upstream to breed. Yet, there are solutions that have been implemented to help these fish including **fish ladders** and **fish cannons**. However, dams have a wide variety of benefits, including tourism to the reservoir, which can help boost the economy, minimal to no pollutants produced, and some habitat creation. Tidal energy is commonly used in coasts with large shores to the ocean. The swell of the changing tides spins a turbine, powering a generator, then creating electricity. Tidal energy faces many similar problems as water impoundment because it requires a large enough tide to generate enough energy and electricity. It also has very limited places it can be implemented because it requires such a large tide to produce enough energy, it can only be used on large coasts. River energy is very similar to tidal energy, in that it uses the flow of the river to spin a turbine, then power a generator, then produce electricity. River energy is different in comparison to water impoundment because it relies on an already existing flow of water, rather than creating one via a dam or a reservoir. However, because the turbine is exposed many organisms in the river are at

risk for swimming into the turbine, which can kill them, or at the very least severely damage many organisms.

Geothermal energy is a newer type of renewable energy, and not one that can be used universally. That is because geothermal energy is where you mine into the earth to access the heat from the Earth's core. However, that requires a place to mine, which is typically on the border of two tectonic plates, otherwise known as a fault boundary. That means that not every single country can use geothermal. However, many island nations have the ability to use geothermal because islands are typically formed due to shifting tectonic plates. Geothermal energy uses heat from the Earth to heat up water, which then can be used for heating homes, or for electricity. Geothermal does not produce many pollutants, and can be used for long term renewable energy. However, geothermal energy is extremely expensive to maintain, and can produce hydrogen sulfide (H₂S).

Hydrogen fuel cells are by far one of the least popular forms of renewable energy, despite being one of the cleanest forms of renewable energy. This is because of the process of gaining hydrogen. Hydrogen fuel cells use hydrogen to react with oxygen, which causes a free flowing electron, which produces electricity, and then emits solely water vapor. Because of the process hydrogen fuel cells use, there is no carbon dioxide produced, nor any particulate matter. It is also easy to implement and use. However, there are very few ways to access hydrogen for the fuel cells. The main way of getting hydrogen is a process called **electrolysis** which is extremely dangerous, and difficult to do.



Previous Solutions

The United Nations Environment Programme supports a wide variety of sustainable energy options, with the goal to decrease fossil fuel reliance for the energy sector to help mitigate the effects of climate change on the world and the environment. The United Nations Environment Programme supports a wide variety of initiatives, and integrated approaches to sustainable energy systems, including energy efficiency and the use of various renewable energy sources.

In order to stay in accordance with the Paris Agreement, the world requires three times more renewable energy capacity by 2030. The United Nations Environment Programme currently works in both the public and private sector to develop sustainable energy markets to be accessible to the world, and ensure renewable energy can be used globally. UNEP accomplishes these goals through a variety of initiatives, projects, programmes, developing policy frameworks, and networks of practice.

One example of the United Nations Environment Programme's work includes the Global Renewables and Energy Efficiency Pledge, which was signed by many countries, working on tripling the world's installed energy capacity to at least 11,000 gigawatts by 2030.

Terms to Know

Terms	Definition
Cogeneration	Use of energy sources for both heat and electricity
Peat	Pre-coal, not fully pressurized organic matter used as an energy source for developing nations

Particulate Matter (PM)	Dust, and other small particles
VOCs	Compounds with high vapor pressure and low water solubility
Photochemical Smog	Smog formed from nitrous oxide that breaks down oxygen, forming ad VOCs, harming respiratory health
Acid Rain	Formed from nitrates and sulfates combining with water vapor, rainfall with a low pH that can alter the pH of the environment
Aquifers	Groundwater
Fish Ladders	A pathway built into dams to allow for fish to swim upstream
Fish Cannon	A literal cannon that can be used to shoot fish upstream past a dam
Electrolysis	Process of using electricity, or lightning to break down water compounds into hydrogen and oxygen
Fracking	Process of getting oil from deep underground trapped between rock and sediment, that requires deep drilling, utilizing large amounts of water, and can cause contamination of aquifers.

Questions to Consider

1. What type of energy does your country use?
2. What energy sector is best for your country's economy?
3. How reliant is your country on certain forms of energy?
4. Does your country invest in renewable energy?
5. What types of energy can your country produce/implement?

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