



UNEP

General Assemblies

Topic 1
Mitigating the second-hand
effects of renewable
resource production

Topic 2
Mitigating maritime pollution

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October 5-6, 2026

Committee
Environment Programme

Georgia Tech
Model United Nations

Bridging technology and diplomacy.



Georgia Tech
Model United Nations

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#GTMUN2026



Letter from the Secretary General



Esteemed delegates,

My name is Henry Bui, your Secretary General for the 2026 edition of the Georgia Tech Model United Nations Conference, also lovingly known as GTMUN. As your Secretary General, I would like to give you all a warm welcome as you begin your journey this conference cycle.

Every year at GTMUN, we see hundreds of you delegates spend hours speaking about your ideas, deliberating with others about the efficacy of solutions, and collaborating with compatriots to draft extensive resolutions. It is always impressive to see each delegate's ability to tackle these very significant issues affecting the real world today, proposing novel solutions, creatively applying international policy, and synthesizing resolutions that solve these urgent questions comprehensively and on a global scale.

I am especially excited to see everything you all will achieve this October. With over 1,000 delegates attending, this will be the largest GTMUN to date, and with it, we are bringing you 18 diverse committees to further test your abilities. Each committee has been carefully crafted to open unique perspectives and to allow each delegate to apply their skills in possibly new, unique ways. I hope that in the midst of being lost in deep research rabbit holes and hours of debate in each session, you all are satisfactorily challenged and that you all leave with joy and excitement in the work you accomplish.

Outside of the Scheller building where you will debate for two days, you will find that many of the skills you have used will be applicable to other aspects of your professional career: your ability to speak publicly, to improvise and adapt, and to act diplomatically. As a computer science student and teaching assistant, I have found that my experience in Model UN has been some of my most valuable. It has taught me to be confident in what I say, and it has taught me how to work with people with all different kinds of backgrounds and perspectives. One of our core values at Georgia Tech is that we thrive on diversity, and that is something that shines strongly at GTMUN.

As you prepare for committee, I want you to remember the most important thing you should get out of GTMUN—even more important than demonstrating your abilities or honing your skills for your professional career—is having fun. Not every speech has to be perfect, and not every unmoderated caucus has to go your way! Take the opportunity to try eccentric things in your speeches and diplomatic approach, and take the opportunity to meet new people. Do not forget that you are surrounded by many others who have similar goals, aspirations, and interests as you do! You might find a future close friend. Though competing is quite fulfilling (and the prospect of awarding is exciting), it can also be very stressful, so it is critical to find joy in what you are doing.

Once again, we, the GTMUN Secretariat, are excited to see everything you will achieve.

Good luck & have fun,

Henry Bui

Secretary General of GTMUN 2026



What is a *Position Paper*?

A position paper is a paper which describes how a country intends to address the topics of the committee, detailing tangible solutions to committee issues and connection to the country's policies. A position paper should contain details for each topic that will be addressed by the committee.

Formatting Requirements

- 12-point font, double spaces Times New Roman
- 1-2 pages per topic (excluding Works Cited page)
- A Works Cited page with citations in MLA format
- Files submitted in .pdf format with title "GTMUN26_COMMITTEE_COUNTRY.pdf"
- e.g., "GTMUN26_DISEC_Germany.pdf" or "GTMUN26_UNEP_United_States.pdf"

Start Each Topic Page With

- Committee: [Name of committee]
- Delegation: [Name of delegation]
- Topic: [Topic name/decription]

Position Paper Rubric

In order to be eligible for awards, delegates must submit a position paper and receive a score of at least 12/20 (for single-topic committees) or 24/40 (for double-topic committees). Refer to the next page for the exact scoring guidelines.

Our AI Policy

Delegates are expected to be drafting documents during the span of the conference using their own thoughts and ideas. As such, GTMUN **does not permit** plagiarism, pre-writing, or the use of generative AI during conferences.

- Plagiarism is the act of using another individual's work or writing and passing it as one's own without proper citation or credit. This includes writing from other delegates in the committee or from online sources.
- Pre-writing is the act of writing material for in-conference documents (e.g., working papers, draft resolutions, crisis directives) ahead of the conference. While doing prior research and bringing research notes is permitted (and encouraged), these notes should not contain text that is intended to be directly copied and pasted into a document. Suspicion of pre-writing is subject to the chair's discretion.
- Generative AI tools (such as ChatGPT, Claude, and Gemini) cannot be used to partially or wholly write a conference document. GTMUN recognizes the rapidly evolving landscape of artificial intelligence engines as a tool for research. Though discouraged, GTMUN accepts the use of such tools to locate resources and brainstorm starting solutions. However, generative AI must not be used to generate content for the conference, such as in-conference documents and position papers. GTMUN encourages the development of creative, unique solutions in committee and knows delegates are more than capable of producing such ideas without relying on generative AI.

Delegates that violate the writing policy will face consequences that may include disqualification from awards.

	Great (5)	Good (4)	Adequate (3)	Poor (1)
Background	- Detailed description of the topic (including dates and stakeholders) - Several facts and statistics - Discusses many relevant UN documents and resolutions	- Basic description of topic (including some dates and stakeholders) - Some facts and statistics - Discusses some relevant UN documents and resolutions	- Minimal description of topic (with no or few dates and stakeholders) - Few facts and statistics - Misses some key relevant UN documents and resolutions	- Unclear or incorrect description of topic - Incorrect or missing facts or statistics - No mention of relevant UN documents and resolutions
Policy	- Country's detailed history with issue - Detailed present position (or a strongly-defended inferred position) of country - Several references to statements from appropriate officials or documents - Several facts and statistics	- Country's basic history with issue - Present position (or reasonable inferred position) of country - Some references to statements from appropriate officials or documents - Some facts and statistics	- Sparsely describes country's history with issue - Present position (or basic inferred position) of country - Few references to statements from appropriate officials and documents - Few facts and statistics	- Incorrect or missing description of country's history with issue - Incorrect present position (or unreasonably inferred position) of country - No references to statements from appropriate officials and documents - Incorrect or missing facts and statistics
Solutions	- Detailed personal objectives - Proposes well-supported potential solutions - Identifies delegates to work with and provides strong reasoning for selections - Actionable, reasonable solutions which are within the scope of the committee	- Expresses personal objectives - Proposes reasonable potential solutions - Identifies delegates to work with and provides reasonable justification for selections - Actionable solutions within the scope of committee	- States personal objective - Proposes potential solutions - Identifies delegates to work with - Actionable solutions	- No proposed goals or plans - No potential collaborators mentioned - Implausible or missing actionable solutions
Mechanics	- No grammar, spelling, or punctuation errors - Numerous and diverse citations from appropriate sources	- Few grammar, spelling, or punctuation errors - Citations from appropriate sources	- Some grammar, spelling, or punctuation mistakes - One or two citations from inappropriate sources	- Many grammar, spelling, or punctuation mistakes - No citations from appropriate sources

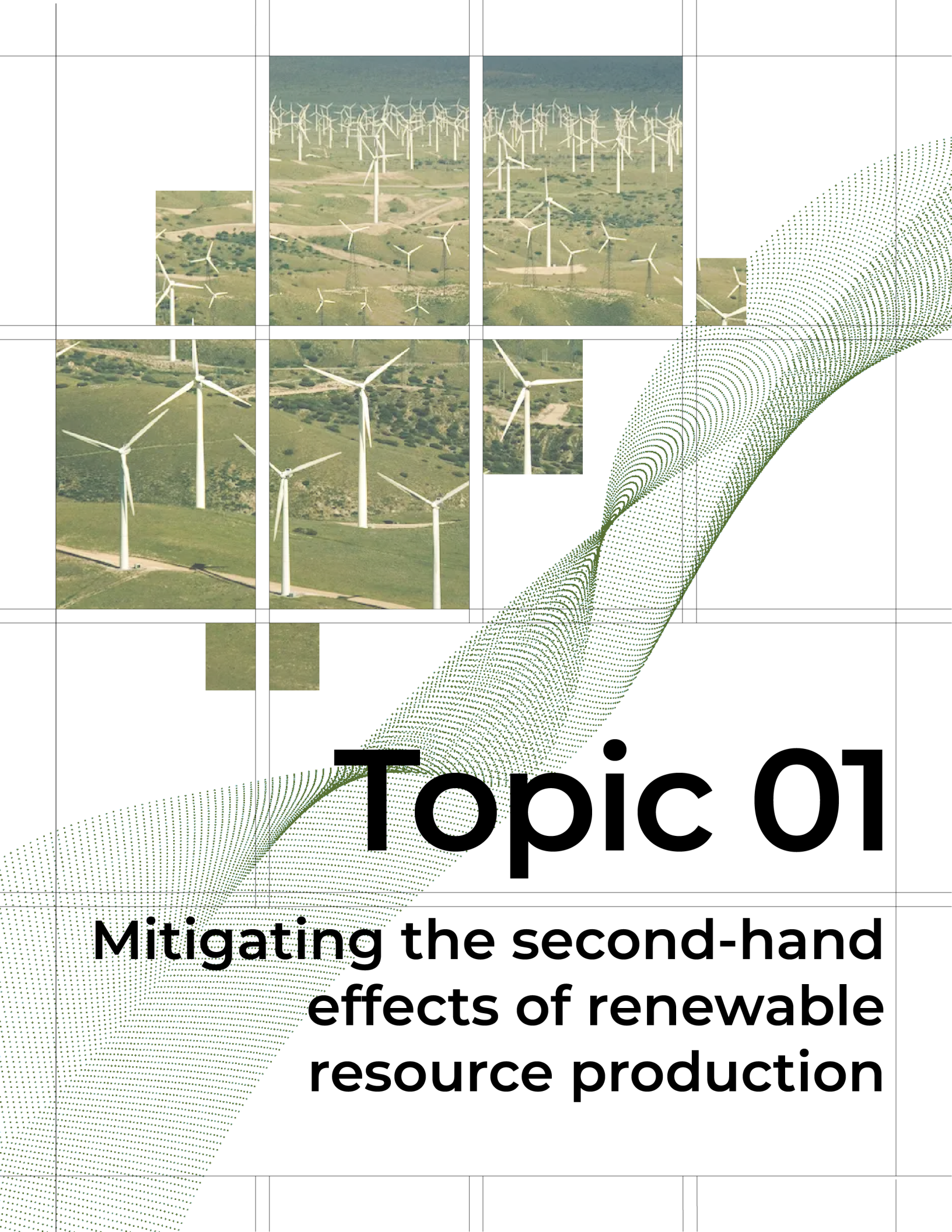
Introduction to Committee

Since 1972, the United Nations Environment Programme (UNEP) has been committed to addressing many of the world's most pressing environmental challenges. With 193 member states and its headquarters established in Nairobi, Kenya, the agency has played a leading role as the catalyst for 15 major multilateral environmental agreements. Its core mission is to monitor the state of the environment, inform policymaking with science, and guide international conservation efforts. UNEP governs through its main assembly, the United Nations Environment Assembly (UNEA), which meets biannually.

While UNEP can set global environmental agendas, provide scientific data, and make diplomatic recommendations, it cannot enforce regulations, impose penalties, or mandate interventions. As a delegate of this committee, you are tasked with proposing actionable solutions and innovative frameworks within these diplomatic constraints. Specifically, this committee will focus on mitigating the second-hand effects of renewable resource production while navigating through the broader implications of the global transition toward sustainable initiatives and technologies.

Disclaimer

The topics addressed in this committee touch upon deeply complex cultural, historical, and political issues that affect millions of people worldwide. Many delegates may have personal connections to nomadic communities, indigenous peoples, or populations affected by sanctions, while others may come from states with histories of implementing policies that have impacted these groups. Delegates should represent their assigned nation's positions while ensuring they act in accordance with the GTMUN delegate handbook, the values of the GTMUN program, and Georgia Tech as a whole. When engaging in debate, we ask that you approach discussions with sensitivity and awareness of the lived experiences of affected communities, avoid perpetuating harmful stereotypes or dismissive characterizations of nomadic lifestyles or sanctioned populations, recognize the dignity and agency of all peoples regardless of their way of life or political circumstances, be respectful of fellow delegates' personal experiences and beliefs, and focus on creating productive, meaningful, and constructive debate that seeks genuine solutions rather than rhetoric. The goal of this committee is to develop thoughtful, evidence-based approaches to protecting human rights and alleviating humanitarian suffering while respecting cultural diversity and state sovereignty, and we encourage all delegates to engage these challenging topics with the gravity and respect they deserve.



Topic 01

**Mitigating the second-hand
effects of renewable
resource production**

Key Terms and Acronyms

Greenhouse gases	Gases that trap heat in the atmosphere, raising the surface temperature of Earth. Human destruction of the environment and burning of fossil fuels adds too many gases to the air, causing global warming and extreme weather events
Fossil fuels	Non-renewable energy sources made from the buried remains of ancient plants and animals. When burned, they release energy used for electricity, heat, and transportation
Circular economy models	A sustainable economic system designed to eliminate waste, keep products and materials in use, and regenerate natural systems
Supply chain	The interconnected journey that raw materials, components, and goods take before their assembly and sale to customers
Mine tailings	Leftover fine-grained waste materials after valuable metals or minerals have been extracted from mined ore
Local value addition	The practice of processing, refining, or manufacturing raw resources within the country or region where they are extracted (rather than exporting them as raw materials)
Microclimate	A small, localized area where climate differs significantly from the surrounding general region

Introduction to the Topic

In 1954, the first silicon photovoltaic (PV) cell, also known as the solar panel, was invented. While early models only converted 6% of sunlight into electricity, modern commercial panels have almost quadrupled in efficiency (American Physical Society, 2009). Solar technology has since become one of the most widely used renewable resource tools, reducing water consumption and improving air quality. However, the surge in solar adoption has introduced growing waste management liabilities, ethical labor concerns, and habitat disruptions. For example, over 100,000 Uyghurs, ethnic Kazakhs, and other Muslim minorities were subjected to forced labor to produce polysilicone, a key material for solar panels, in the Xinjiang Uyghur Autonomous Region. These unintended consequences demonstrate the second-hand effects of renewable resource production, in which the manufacturing, deployment, and disposal of clean energy infrastructure can cause indirect environmental and resource strain, economic and supply chain shifts, and an overdependency on metals and material extraction.

Renewable energy is derived from natural sources that are replenished at a higher rate than they are consumed. Common types consist of solar power, wind power, hydropower, geothermal, and biomass. According to the United Nations, it has been stated that to avoid the worst impacts of climate change, emissions must be reduced by nearly half by 2030 and reach net-zero by 2050. Because the power



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sector has been the largest source of global greenhouse gas emissions, with fossil fuels accounting for “nearly 60% of electricity generation” (United Nations, n.d.), renewable adoption is vital to achieving a cleaner, more affordable, and more reliable world. That said, like solar PV manufacturing, expanding these technologies at scale generates substantial secondary risks across their lifecycles.

Due to these drawbacks, UNEP has been handling the secondary impacts of

renewable energy by promoting responsible extraction frameworks, material efficiency guidelines, and circular economy models. However, these methods have struggled to produce widespread results. This has been primarily due to factors such as the agency's lack of enforceable authority, growth in energy demand, geopolitical pressures, and fragmented global supply chains. As environmental concerns and climate change have caused and are continuing to cause detrimental effects, it is imperative to adopt initiatives such as renewable resources that encourage sustainability; however, many argue whether the negatives of their creation outweigh the positives of their use. These complex components have led countries to remain divided over the extent to which the international community should govern the production of renewable resources, balancing concerns of environmental sustainability, economic development, public health, and national sovereignty.

Historical Background

Prior to the industrial revolution, humans relied almost entirely on renewable energy sources. However, due to overconsumption of local materials by both households and businesses, many nations began turning to coal to meet rising demands. This marked the first major energy transition, sidelining renewable sources. As fossil fuel production grew, its cost fell, attracting large-scale adoption and scrutiny of renewables. However, in the 1970s, diplomatic tensions causing uncertainty around fossil fuel exports led many countries to begin researching and investing in developing alternative energy sources (solar, wind, nuclear, etc.) and energy efficiency to achieve national energy independence. Combined with momentum from the creation of the UNEP in 1972 following the landmark UN Conference on the Human Environment, these historic milestones exposed the fragile link between rampant fossil fuel dependency, leading the way for new environmental agreements and protocols.

In 1988, UNEP, alongside the World Meteorological Organization, developed the Intergovernmental Panel on Climate Change (IPCC), with its main focus on informing governmental bodies about the state of knowledge of climate change through assessing climate data, reviewing global research, and publishing objective scientific information. The panel published its first assessment report in 1990, prompting the UN to launch negotiations for a global climate framework treaty. Due to the lack of legally binding emissions targets, many nations negotiated an extension known as the Kyoto Protocol in 1997, requiring industrialized nations to “reduce the emission of six



Artisanal miner holding cobalt stone at Shabara mine in DR Congo

greenhouse gases...to 5.2%” (Britannica Editors, 2026). To meet these commitments, governments turned to market incentives to speed up clean energy adoption. Policies such as feed-in tariffs, which lowered investment risks, and cap-and-trade programs, which established market-based carbon pricing, became vital tools. These incentives established localized economic mandates that guaranteed prices, created stable utility targets, and dramatically scaled production capabilities. Additionally, UNEP annual reports tracking global clean energy investment highlighted how falling production costs were making renewables market-competitive, convincing private investors that green energy was profitable. Between 2010 and 2020, the cost of solar PV power fell by 85%, with, over the same duration, the cost for onshore wind projects declining by 56% (Larson, 2021). For the first time since the Industrial Revolution, green energy became the cheapest source of new electricity generation on the planet.

This rapid surge in renewable production created significant second-hand economic and structural ripple effects. On one hand, clean energy gave the ability to curtail fossil fuel dependence, created thousands of clean tech jobs, and decreased global generation costs. On the other hand, it introduced deep vulnerabilities in traditional power grids, a new wave of resource extraction and ecological degradation, and heavy dependency on critical minerals such as lithium and cobalt. Furthermore, severe human rights issues surfaced across supply chains, particularly regarding labor exploitation. The working conditions of extracting these materials cause health-harming air pollution, forced displacement, and a loss of livelihoods. Beyond extraction processes, as early-generation installations of resources like solar panels and turbine blades reach the end of their lifecycles, the non-recyclable blades and heavy-metal e-waste create unprecedented disposal challenges.

By 2009, UNEP began increasingly highlighting the overlooked side effects of the green transition. This included publishing multiple reports detailing how less than 1% of critical specialty metals, which are vital for green technologies, were being recycled globally and that up to 90% of global electronic waste was being illegally dumped (Nichols, 2015). To address this, in 2017, UNEP formally adopted circular economy principles, aiming to design a system in which materials never become waste and are kept in circulation, and in 2018, co-founded the Platform for Accelerating the Circular Economy (PACE) to scale circular models for electronics, plastics, and clean tech. The following year, Resolution 4/19 on Mineral Resource Governance officially mandated the agency to address the environmental, human rights, and supply chain impacts of critical mineral extraction. Despite these regulatory advances, second-hand effects or renewable source reproduction has continued to widen the ecological and socioeconomic footprint of the clean energy transition, thus posing worsening challenges for global supply chain stability and international regulatory frameworks while amplifying the need for appropriate management measures around the world.

Current Challenges

Today, the global energy transition faces a central paradox where the urgent need to cut carbon emissions is actively clashing with a severe shortage of critical minerals, delayed grid connections, and surging power demand. Currently, primary resource extraction remains far cheaper than complex chemical recycling, resulting in private companies having little commercial incentive to invest in secondary resource recovery. Because UNEP operates strictly as an advisory and diplomatic body, its resolutions rely almost entirely on voluntary compliance and international consensus rather than enforceable mandates. With high costs of chemical recycling, lack of financial incentives, and low voluntary compliance, the renewable energy transition risks hitting a structural stalemate where market forces actively disincentivize the circular economy required to sustain it (Down To Earth, 2026).

Furthermore, mirroring the historical trends of fossil fuel extraction, the raw materials driving clean energy technologies remain disproportionately extracted from developing nations across the Global South. However, primary ore extraction yields the lowest profit margins in the value chain and is subject to quick market volatility, as unpredictable export controls introduce severe price fluctuations for renewable components. Consequently, host nations receive unstable revenue while the very efforts to protect the planet are imposing severe environmental and human costs on the world's most vulnerable communities. As global consumption increases, scientists predict that by 2050, the demand for minerals such as lithium, cobalt, and nickel could quadruple if current extractive policies persist. Some proponents have argued that these critical minerals are becoming the “oil of the 21st century,” as the global rush to secure clean energy supply chains draws an uncomfortable parallel to the geopolitical and ecological exploitation of the fossil fuel era (Silverstein, 2024). Moreover, while extraction has occurred primarily in the Global South, refining and processing are heavily concentrated in only a handful of countries, most notably China, which controls a large share of the global capacity for vital minerals like



Artisanal miner holding cobalt stone at Shabara mine in DR Congo

lithium, cobalt, and graphite. This reliance on concentrated processing deprives host nations of economic opportunity, as refining, chemical processing, and component manufacturing capture three to four times more economic value than raw mining.

Beyond the immediate financial rewards, controlling refining capacity grants significant geopolitical and

economic leverage. Nations attempting to decarbonize their power grids or electricity transport become collateral damage in broader trade disputes, as access to the physical components of the energy transition becomes conditioned on foreign policy alignment. By securing critical mineral supply chains, shifting global trade power, and creating high-value manufacturing jobs, dominating nations turn renewable resource production into diplomatic influence and strategic alliances. Just as many nations have long sought to reduce oil dependence to gain domestic stability and avoid vulnerability to trade blockades, control over materials like lithium and cobalt is actively reshaping international diplomacy, making the analysis of these second-hand effects crucial to the international community.

Simultaneously, rising demand from artificial intelligence data centers is driving a massive need for constant electricity. In response, major tech companies have begun signing agreements to power operations directly with nuclear energy alongside wind and solar power. While nuclear is not a renewable resource, it is increasingly categorized alongside clean energy due to its minimal land footprint and immense power density, providing a reliability similar to renewable options such as geothermal energy and biomass. However, similar to how lithium and cobalt refining are held primarily in just a single nation, global uranium enrichment remains heavily centralized, with Russia controlling nearly half of the market. Consequently, this expansion of nuclear power further introduces geopolitical vulnerability to clean energy production.

As a result of these compounding pressures, in the years 2022 and 2024, the UN Environment Assembly adopted resolutions 5/12 and 6/8, tasking UNEP with leading global intergovernmental consultations on the environmental aspects of minerals and metals management, establishing a digital knowledge hub, and providing technical capacity-building for producer countries regarding mine-tailing safety. Further institutionalizing this effort, the UN secretary-general endorsed the formal establishment of the UN Task Force on Critical Energy Transition Minerals, co-chaired by UNEP, to implement the five technical clusters covering local value addition, supply chain traceability, a global mining legacy fund, artisanal mining, and material circularity. Yet while these frameworks champion UNEP's "8 Rs" of circularity (rethink, reduce, replace, reuse, recover, recycle, retain, and responsible mining) and offer comprehensive international guidelines, persistent gaps in e-waste recycling, grid hardware integration, labor safeguards, and ecological protection continue to undermine the clean energy transition. As UNEP and the international community work to promote global cooperation and mitigate climate change, directly overcoming these challenges remains essential to mitigating the negative externalities of renewable resource production.

Recycling and E-Waste Processing

Clean Energy Technology Hardware (CETH) is the physical devices, power electronics, and structural hardware required to convert and store renewable power. Additionally, they represent a rapidly accelerating waste management challenge. Some of these tools consist of solar PV modules, electric vehicle components, battery

energy storage systems, and wind turbine power electronics and are all made of refined transition metals such as lithium, cobalt, nickel, and copper. In 2025, the “global market for key clean energy technologies exceeded \$1.1 trillion” (Green Building Africa, 2026). However, as the push for sustainable infrastructure intensifies, there is heightened concern about end-of-life management for CETH as initial deployments reach the end of their operational lifespans.

For many CETH resources, the components are rarely designed for easy disassembly and cannot be easily recycled. For instance, wind turbine blades are normally built from non-biodegradable fiberglass composite, with solar panels and battery packs being sealed with structural adhesives. While there are recycling processes such as pyrometallurgy, which burns the hardware until it is a metallic alloy, and hydrometallurgy, which shreds the hardware into fine powder or “black mass” that later dissolves into a liquid metal, these secondary recovery systems are not widely used at scale. The underutilization primarily stems from the cost gap between landfill disposal and recycling; as of now, landfill disposal remains vastly cheaper than chemical or thermal recycling processes. Moreover, CETH frequently contains highly volatile chemicals such as lead or cadmium, making logistics of transportation and housing incredibly difficult.

Establishing functional recycling loops for CETH is imperative, as landfills are already a major driver of climate change due to producing a massive amount of methane gas. In addition, rainwater filters through garbage, creating toxic runoff that can leak into local groundwater and soil. Uncontrolled landfill sites also cause smog-forming compounds that degrade local air quality, thus posing severe public health and habitat loss risks.

Grid Hardware Integration

Electric grids are interconnected networks of components that generate, transmit, and deliver electricity to a consumer. Traditional power systems were designed for

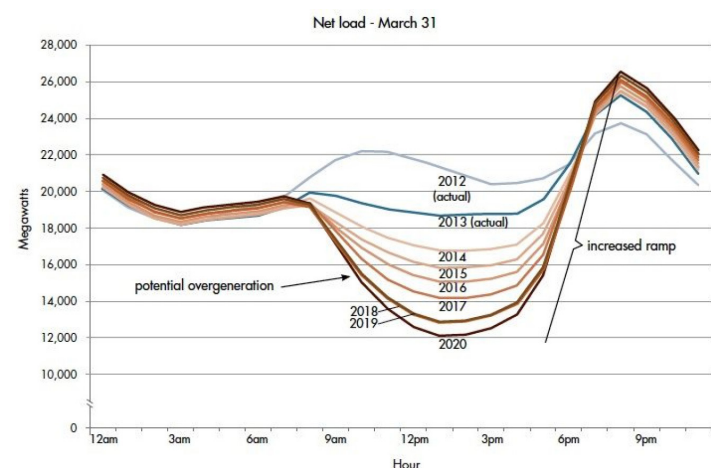


Pyrometallurgy

predictable and dispatchable power, such as coal, gas, or nuclear plants, which can be turned up or down to meet demand on command. However, renewable resources like solar and wind power are heavily weather-dependent, creating several grid and infrastructure challenges.

Solar energy generates the most electricity during the midday, when the sun is typically the brightest. However, electricity demand peaks in the evening hours as people return home, turn on appliances, and cook. As midday solar production floods the grid, the “net load,” or the total demand minus solar and wind generation, decreases significantly. Analysts have called this phenomenon the “duck curve,” as the midday plummet forms the shape of a duck’s belly. As the sun sets, two events collide: solar generation collapses while household electricity demand surges. Grid operators must then rapidly ramp up alternative power sources to prevent blackouts during this steep curve.

Conversely, wind and solar can also generate more electricity than the grid can handle. As a result, when transmission lines become congested, operators resort to curtailment or intentionally cutting off or dumping clean electricity generation. Disconnecting clean power plants triggers even further secondary consequences such as financial strain on developers, which makes clean energy projects riskier to



The duck curve, demonstrating the excess in supply created by solar

finance and raises the cost of future green investments. Furthermore, when power is curtailed in one area due to local congestion, operators in nearby regions may still need to turn on natural gas plants to meet demand, causing clean energy to be wasted while fossil fuels are burned elsewhere.

In addition, geography presents another major hurdle. In the past, power plants were placed close to population centers or nearest established

rail and pipeline infrastructure. In contrast, solar and wind energy must be placed where natural resources are the most abundant. For solar energy, this encompasses sunny, arid deserts, and for wind power, open plains, mountain passes, or offshore coastal corridors are optimal conditions. Because these locations are often remote, connecting generation sites to urban demand centers requires thousands of miles of new high-voltage direct current (HVDC) transmission lines. While HVDC lines carry electricity over long distances with lower power loss than standard alternating current (AC) lines, building them involves extensive land acquisition and billions in high initial costs. Scholars have noted that “wind and solar generation require at least

10 times as much land per unit of power produced as coal...” (Gross, 2020). Securing this land creates its own secondary issues of land-use conflict with agriculture, habitat disruption, and community backlash from rural residents concerned about local scenery, property values, and potential displacement.

Labor Safeguards and Ecological Protection

While renewable energy offers renewed hope for mitigating the world’s climate crisis, its rapid expansion has, in some cases, come at the direct expense of human rights and environmental protection. As climate change intensifies, resulting in increasing heatwaves, droughts, and natural disasters, many nations that contribute very little to global greenhouse emissions often suffer the worst consequences. However, these same low-emission nations frequently hold the world’s richest deposits of critical transition metals, resources that would be expected to bring immense local wealth but instead have left local communities bearing the physical detriments of the green transition. Outside of financial loss, frontline populations face severely exploitative working environments across extraction and manufacturing supply chains. While, according to the International Renewable Energy Agency, the renewable energy industry offers jobs for over 16.2 million people, workers near these mining operations experience a much harsher reality: facing wage theft, unlawful overtime, and one of the worst effects: hazardous labor conditions. Communities working in or living near operations sites are regularly exposed to chemical and biological toxins, especially from heavy metals such as cadmium. Prolonged exposure has been linked to severe health disorders such as chronic respiratory strain, birth defects, skin rashes, and cancer.

Beyond human costs, renewable energy production has also caused detrimental impacts to the environment, particularly marine ecosystems. Due to the shortage of critical metals on the earth’s surface, high concentrations of vital transition metals have been found in seabed deposits in various parts of the world’s waters.



Miners working at the Shabara mine in DR Congo

Currently, companies like Deep Sea Mining Finance Limited (DSMF) are being developed to advance commercial deep-sea mining, which could promote the expansion of this market globally. However, the environmental consequences that could be created by large-scale submarine mining are vast and still largely uncertain. Heavy machinery on the seabed creates enormous dust clouds that travel through

the water column, choking filter-feeding organisms and blocking light. In addition, surface separation vessels pump toxic tailings and wastewater back into open water, poisoning local food webs. If marine systems such as the carbon cycle are disrupted or oxygen is depleted for deep-dwelling species, reversing these effects can take millions of years to fix.

Compounding these human rights and environmental risks is the sheer urgency of the global energy transition. The high pressures to close the mineral supply deficits have driven more governments to fast-track permits, increasing the risk of rushed environmental reviews and further community exploitation.

Case Study

Brine extraction in the Atacama Desert

Stretching across northern Chile sits the Atacama Desert. Blocked by high Andean mountains on one side and cooled by the Humboldt current in the Pacific on the other, parts of the desert have not seen measurable rainfall in centuries, making it the driest non-polar desert on Earth. While the region's clear skies and zero light pollution have long made it vital for astronomical observatories, just below the surface it holds another critical resource: lithium. Found in high concentration within underground brines, lithium extracted from the Atacama Desert supplies a major share of the global supply used in rechargeable battery protection.

Although the Atacama has become essential to the global green energy transition, lithium extraction showcases the significant consequences of renewable energy production, directly impacting neighboring communities and the already fragile local

ecosystem. The town of Peine, one of the closest settlements to the lithium mining operations, is home to the Lickanataj Indigenous community, who have lived in the Atacama Desert for millennia. However, today their future is at severe risk of erasure. Before lithium can be refined, mineral-rich brine is pumped from underground, combined with fresh groundwater, and transferred to vast surface evaporation ponds. From here the concentrated lithium salts are driven to the



Pools of brine containing lithium carbonate and salt mounds in a lithium mine in the Atacama Desert

coast, where they are purified and exported to be made into batteries, most notably seen in cellphones and electric vehicles.

As of currently, three major companies operate in the Atacama. Each year, brine extraction depletes the region's scarce water, causing parts of the salt flats to sink by one to two centimeters per year. As a result of this water loss, there has been a reduction in local vegetation and soil moisture, resources that are heavily relied upon by indigenous communities like the Lickanantay, and native wildlife like flamingos. Furthermore, the large evaporation ponds and depleted soil moisture have altered microclimates, increasing evaporation rates and elevating daytime temperatures.

In response, the companies working in the region have set "rental contracts with Chile's state developmental body, CORFO, through which money is set aside for the sustainable development of the communities" (Bartlett, 2025); however, there has been little consensus on what should be done with the proceeds. Local community members point out that even if direct compensation is given, money cannot replace a depleted ecosystem, nor can it mitigate the deafening reality that lithium reserves are finite.

As global demand for green technology drives further extraction, Chile is preparing for a change: starting in 2031, a new public-private partnership model will take over the lithium contracts, making the Chilean government the majority shareholder. While it represents an unprecedented step for the nation's mining industry, it remains uncertain whether state control will be successful in balancing global renewable energy demands with local environmental and social protection and, if so, whether other nations should follow suit.

The Fosen Vind Wind Farm

Located in central Norway, the Fosen Vind power complex is Europe's largest onshore wind power project. Commissioned in 2018, the complex encompasses six wind farms and 278 turbines, which has more than doubled Norway's capacity for wind power generation. The site was selected primarily for its exceptional and reliable wind patterns it yields annually. However, since the beginning of its construction, the project has received massive criticism and legal pushback. The peninsula's land also serves as an ancestral reindeer grazing habitat, which is of great importance to the Southern Sámi reindeer herders and Sámi culture. The herders have claimed that the wind farm's physical footprint, noise, and infrastructure are in violation of their human rights and the rights of indigenous people. Due to the dispute, a trial was held before the Norwegian Supreme Court, in which it ruled Fosen Vind and the Norwegian state were infringing upon the Sami's right to enjoy their land and culture. However, despite the ruling, the government chose not to dismantle the turbines due to the massive loss of renewable power that would result.



Wind mills at the Fosen Vind Wind Farm

Historically reliant on fossil fuel exports, Norway has increasingly shifted toward the adoption of renewable energy. Under the Norwegian Climate Change Act, the country is mandated to lower its greenhouse gas emissions by over half by 2030, with the long-term goal being to achieve an almost 90%-95% reduction in domestic emissions by 2050. “These ambitious targets can only be met by actively decarbonizing domestic industries” (Maree, 2026). As a result, the country had begun using regional hydroelectricity; however, this sole reliance on hydropower became incredibly challenging during the nation’s prolonged periods of drought. Due to this, the country began investing in alternative energy sources, such as wind capacity, to protect critical infrastructure and ensure energy security.

This push for wind generation has since increased tension between the Sámi people and the Norwegian state, sparking widespread protests joined by notable Swedish environmental activist Greta Thunberg. By late 2023 and 2024, the Norwegian government and Sámi representatives reached formal agreements to allow the wind farms to continue operating in return for annual financial compensation, local energy allocations, new winter grazing rights for the reindeer herders, and veto rights over future lease extensions.

The compromise illustrates a broader picture of the importance of nations balancing climate and social policies, a fine line where rapid environmental goals can collide with social justice, human rights, and land protections.

The Three Gorges Dam

Located on the Yangtze River in Hubei Province, China, sits the Three Gorges Dam. It is the largest hydroelectric power station by installed capacity (22,500 MW), generating an average 95 terawatt-hours (TWh) of clean electricity annually. It was created in 2006 and since has improved the Yangtze River's shipping



The Three Gorges Dam

capacity, reduced massive carbon dioxide emissions, and protected millions of people from severe flooding on the Yangtze Plain. The hydroelectric power it generates has also helped fuel China's economic growth, making the project a national pride and a social and economic success for the country. Recently the nation has advanced plans for even larger hydropower initiatives, most notably the Yarlung Zangbo (Brahmaputra) Dam, a move that has escalated regional geopolitical tensions with downstream nations like India and Bangladesh.

Beyond diplomatic conflict, such mega-dam projects like the Three Gorges Dam have drawn major controversy, as its creation displaced an estimated 1.4 million people, inundated ancient and culturally significant sites, caused severe ecological changes, and increased the risk of landslides and earthquakes. Consequently, while conventional hydropower remains a popular renewable tool, as it is reliable, low-cost, and a grid stabilizer, construction of massive new conventional river dams has largely slowed. Many energy agencies have now shifted toward Pumped-Storage Hydropower (PSH). A type of hydroelectric energy storage that can generate power as water moves between two different elevated water reservoirs. PSH provides cost-efficient, large-scale energy storage and acts as a fast-responding battery to balance supply and demand in real time.

Directives / QARMAs

As delegates of this specialized agency, it is critical to examine how the rapid adoption of renewable resources intersects with the evolving climate change crisis while simultaneously mitigating the second-hand effects of alternative energy deployment to protect national sovereignty over critical minerals, ensure supply chain security, and safeguard public health. To guide your research and resolution drafting, consider the following key questions:

How can international policies and frameworks balance the urgent global deadline to mitigate climate change against the rights of communities, especially those living near extraction sites?

How should governments measure whether a green energy project/tool is successful?

What strategies can governments or businesses use to make circular supply chains economically competitive?

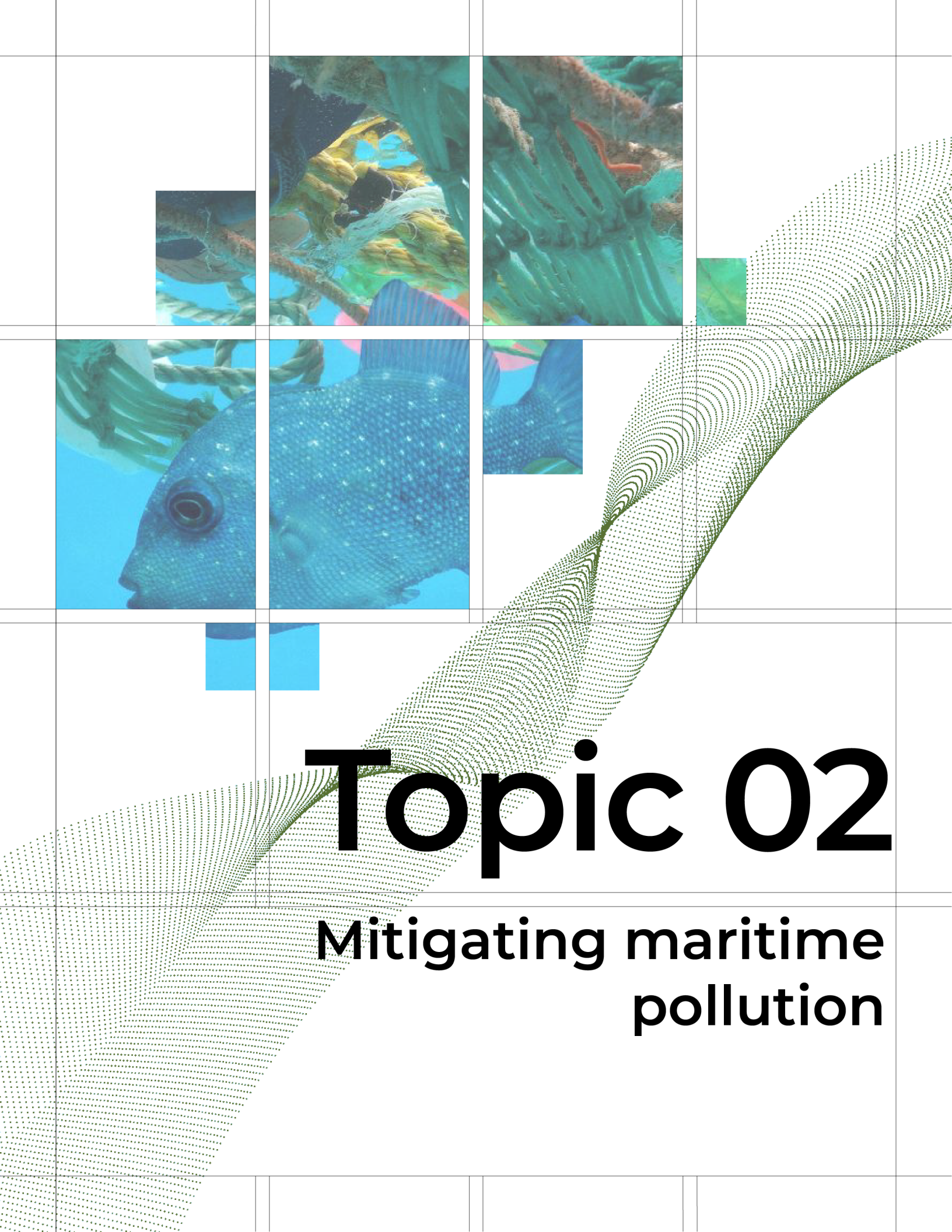
What measures can be taken to ensure the safety of workers in the renewable sector while meeting global demands for clean energy materials?

How can modern electrical grids be redesigned to efficiently store, manage, and distribute renewable energy?

How might a country rich in raw materials balance the immediate economic benefits of exporting resources with the long-term goal of protecting its natural environment and local industries?

Given the ecological and economic drawbacks of every energy source, what principles should guide how fast and in what way nations shift their energy systems?

In today's world where a mineral is extracted in one country, processed in another, and used in a third, how can UNEP frameworks ensure that human rights and the environment are equally protected at every part of the supply chain?



Topic 02

Mitigating maritime
pollution

Key Terms and Acronyms

Maritime Pollution	Introduction of harmful materials, including degradable waste, fertilizers, dissipating waste, particulates, etc., into marine environments through human activities (Ocean Pollution, n.d.)
Biodegradable Waste	A type of waste typically originating from animal or plant sources that can be degraded by living organizations (ScienceDirect, n.d.-a)
Particulate Pollution	A mixture of solid particles and liquid droplets that is typically emitted from power plants, industries, and automobiles (US Environmental Protection Agency, 2016)
Dredging Soil	The act of removing silt and other materials from the bottom of bodies of water to prevent the spread of contaminants to other areas of the water body (National Oceanic and Atmospheric Administration, n.d.-b)
Biomagnification	A phenomenon where concentrations of persistent hydrophobic organic contaminants in an animal are elevated compared to its food and surrounding environment (ScienceDirect, n.d.-b)
Eutrophication	Occurs when the environment becomes enriched with nutrients, increasing the amount of plant and algae growth to bodies of water (National Oceanic and Atmospheric Administration, n.d.-c)

History

- **1972:** Convening of the United Nations Conference on the Human Environment which led to the formation of UNEP (UN Environmental Programme, 2021).
- **1973:** Convention for the Prevention of Pollution from Ships. This international convention works to prevent the pollution of the marine environment by ships from operational or accidental causes. (International Maritime Organization, n.d.).
- **1988:** Creation of the Intergovernmental Panel on Climate Change (IPCC). The three working groups collaborate to assess the current climate, the changes due to human activity, and brainstorm mitigation and adaptive measures (Intergovernmental Panel on Climate Change, n.d.).
- **June 2012:** UN Conference on Sustainable Development develops the Global Partnership on Maritime Litter (GPML) in response to the problem of marine litter. Action Plans from the GPML suggest policy, regulatory, and technical obligations and measures for sustainable production, waste management, and monitoring/enforcing national legislation. Under the umbrella of the GPML, there are regional seas programmes to coordinate action and partner to address land and human-based sources of marine pollution (UN Environmental Programme, 2017).
- **2021:** UN Ocean Decade Begins. This provides a convening framework for a wide range of stakeholders to engage and collaborate across countries. Ocean scientists can successfully manage the countries' actions to sustainably manage the oceans and achieve the 2030 Agenda (Ocean Decade – The Science We Need For The Ocean We Want, 2025).
- **2022:** Creation of the Intergovernmental Negotiating Committee on Plastic Pollution. This committee was created to develop “the instrument” that will regulate the full life cycle of plastic, including its production, design, and disposal (UN Environmental Programme, n.d.).
- **2023:** Creation of the Global Framework on Chemicals. This framework hopes to create the regulatory environment to reduce chemical pollution and promote safer alternatives (UN Environmental Programme, 2023).
- **2025:** Establishment of Intergovernmental Science-Policy Panel on Chemicals, Waste, and Pollution. This newly established panel is expected to conduct global pollution assessments, identify knowledge gaps between the local communities and scientists, and integrate more effective monitoring/enforcement measures (UN Environmental Programme, 2025).

Introduction to the Topic

Oceans are currently being taken over by marine pollution. Marine pollution, a combination of debris and chemicals, is washed or blown into the oceans off of land or boats. Many types of marine pollution affect the health and flourishing of ocean ecosystems. When additional nutrients and chemical contaminants are added to ocean ecosystems, they disturb ecological balances and cause algal blooms (Wijesinghe et al., 2026). Marine debris, including plastics, metal, glass, rubber, and textiles, physically destroy ecosystems and the individual species within them (Wijesinghe et al., 2026). Ocean noise pollution, primarily from military sonar and shipping interferes with the behavioral patterns, navigation, and communication between marine species (Wijesinghe et al., 2026).

The United Nations Environmental Programme has placed considerable effort into preventing and mitigating the effects of maritime pollution. The UNEP Plastics Initiative is rooted in four strategic areas, including eliminating and substituting unnecessary plastics and hazardous additives, ensuring products are designed to be circular, ensuring plastic products are reused, recycled, or composted, and lastly, managing plastic waste that cannot be reused or recycled in an environmentally sound manner (UN Environment Programme, 2023). With different intervention areas and

scales of approaches, the Initiative works with a wide range of partners and stakeholders to achieve 45 countries improving their plastics policies, 500 private sector actors in key industries will have adopted effective circular solutions, and 50 financial institutions will have included plastic pollution prevention in their sustainability targets by 2030 (UN Environment Programme, 2023).

While plastic marine pollution has been the primary target of global efforts, in the past five years, more emphasis has been placed on other forms of ocean pollution. In 2026, the Special Rapporteur on toxics and human rights called for input on a thematic report on “forever chemicals” (PFAS) and their implications on human rights (Call for Input - Forever Chemicals (PFAS) & Human Rights, 2026). This report will identify how the adverse impacts of forever chemicals are related to present and future human rights



Cover page of "Turning off the Tap: How the world can end plastic pollution and create a circular economy"

violations. Furthermore, it also seeks to identify gaps and shortcomings in national, regional, and multilateral legal frameworks governing PFAS.

Oil Spills

The International Tanker Owners Pollution Federation, a not-for-profit organization with offices in the United Kingdom and Singapore, collects and stores historical and present information about oil spills. Since the 1970s, oil spills have been decreasing dramatically, specifically larger spills that are more than 700 tonnes (ITOPF, 2021). Between 2010 and 2019, there were an average of 1.8 spills per year, as compared to 1970-1979, when there were 24.5 spills per year on average (ITOPF, 2021).

While these statistics are reassuring, the resurgence of fracking, a method used to extract natural gas and oil from deep rock formations, makes smaller-scale oil spills more common. There are multiple environmental concerns with fracking, such as fracking fluids having chemicals that could pollute the surrounding environment and the destruction of marine ecosystems due to heavy machinery use. Several states, such as Tunisia and Ireland, have banned fracking due to the widespread environmental concerns (National Institutes of Health, n.d.-a). Other states have been more reluctant due to the economic benefits that come with fracking.

Point Source Pollution

Point source pollution is discharged from factories or sewage treatment plants and include oil refineries, paper mills, and electronic/chemical manufacturers. There are several variations of how these factories and plants discharge their waste, such as discharging it in their own water or directly into a nearby water source. Some treat it themselves before it is released, and others may send it to sewage treatment plants to treat. Because of the difference in dumping methods, lack of enforcement, and economic reliance on oil specifically, point pollution becomes increasingly difficult to solve (National Oceanic and Atmospheric Administration, n.d.-a).

For example, in Ecuador, there are various environmental codes and laws, such as the Organic Environmental Code and the Environmental Management Law, both of



The heavy oil is being extracted and removed with tankers

which establish the obligation to immediately restore environmental damages if committed (Popescu, 2023). However, Chevron, the oil company, has a total of 1,107 liabilities, including cases of waste pits filled with oil and hydrocarbon wells, but has yet to clean the damage or pay the fines they owe to Ecuador, totaling \$9 billion USD

(Popescu, 2023). Not only do these spills have environmental damages, but they also pose health risks to the people in the communities of Orellana and Sucumbíos, Ecuadorian provinces.

Non-Point Source Pollution

Non-point pollution occurs as a result of runoff, which typically occurs after a heavy rainstorm. The runoff runs over oil left by cars or other vehicles and flows downstream into larger bodies of water. Although the concentration of some pollutants may be lower compared to point pollution, the total amount may be higher due to the pollutants originating in multiple places (National Oceanic and Atmospheric Administration, n.d.-a). Unlike point-source pollution, non-point pollution is more difficult to regulate due to the decentralized sources.

China has released regulations and action plans to prevent and control non-point source pollution throughout the country. To do this, the government set out to reduce emissions from production and daily activities utilizing a three-pronged approach: shut down, tighten control, and upgrade management (China's Policies and Actions for Addressing Climate Change 2025 Annual Report, 2025). The government aimed to shut down approximately 300 general manufacturing and polluting companies and relocate/reorganize other smaller industrial clusters, tighten control by carrying out more frequent inspections on enterprises with large annual emissions, and upgrade management by expanding inspections to include petrochemical, printing, automobile maintenance industries, and more (China's Policies and Actions for Addressing Climate Change 2025 Annual Report, 2025). Along with other measures, China hopes that implementing these policies, non-point source pollution will decrease.

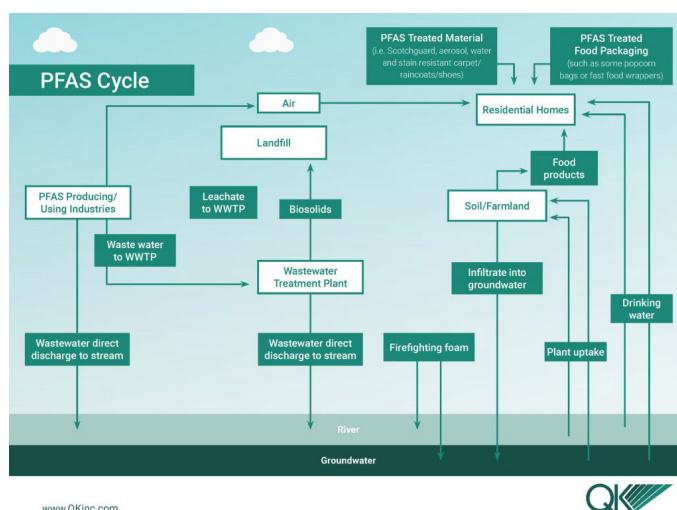
Per- and Polyfluoroalkyl Substances (PFAS)/Forever Chemicals

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been used in various consumer products since the 1950s, such as stain-resistant and non-stick pan formulas. PFAS molecules have a chain of linked carbon and fluorine atoms, and due to the strength of this bond, they do not degrade easily in the environment (National Institutes of Health, n.d.-b). They are toxic to life above the ground and below the water, even at low concentrations, and widespread due to the unregulated use since the 1950s (National Institutes of Health, n.d.-b). In most of the world, there is still limited monitoring and regulation for PFAS, leading to contamination in surface waters, which is used for drinking, swimming, and fishing (UN Department of Economic and Social Affairs, n.d.). Because of the limited monitoring, scientists are still unsure if certain groups of people take in more chemicals than they excrete or are at a higher risk of exposure (UN Department of Economic and Social

Affairs, n.d.).

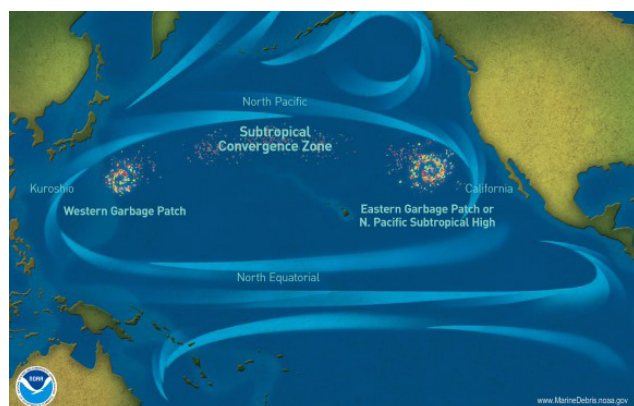
All throughout the continent of Africa, research on PFAS has increased tremendously in the past decade. Utilizing mass spectrometry techniques, studies in South Africa and Uganda have shown the highest concentrations near waste-water treatment plants (WWTP). In Kampala, Uganda, there were 26 PFAS identified from a WWTP (Aborode et al., 2025). It should be noted the elevated PFAS concentration

near the WWTP is not uncommon; however, Kampala's sewage system does not safely transport wastewater, leading to this wastewater harming drinking water and other bodies of water (Aborode et al., 2025). In Uganda, according to The National Environment (Air Quality Standards) Regulation, the lead agency for fuel standards, in collaboration with other agencies, adopts limit values for harmful substances in products and stockpiles (National Environment (Air Quality Standards) Regulations, 2024, 2024). However, due to the difficulty of enforcement and decentralized water discharge and treatment services, this law has not made the impact it could have on Uganda.



Plastic Pollution

Currently, the ocean contains between 250 million and 300 million metric tons of plastic (Denchak, 2022). The majority of the garbage that enters the ocean each year is plastic due to the fact that plastic will not biodegrade. The plastic instead breaks down into smaller and thinner pieces, staying in the water. 80% of the marine litter is in the ocean from land-based sources, such as storm drains, sewers, and by other



Garbage from beaches, tributaries, and waste dumped at sea gets trapped in ocean currents and tends to congregate in distinct regions; the detritus in the Eastern Pacific is colloquially referred to as the Great Pacific Garbage Patch

smaller bodies of water (Denchak, 2022). Plastic pollution is harmful to various species, including loggerhead sea turtles mistaking plastic for food, seals getting entangled in abandoned plastic fishing nets, and plankton not receiving sunlight (Denchak, 2022). Not only are plastics harmful to individual species, but they also emit harmful pollutants that affect the ocean.

The most common example of plastic pollution is the Great Pacific Garbage

Patch, which spans the Western United States of America to Japan. Because of the North Pacific Convergence Zone, warm water from the South Pacific brushes up against the cooler water from the Arctic. There are larger pieces of plastic that are visible, in addition to smaller pieces that are microplastics. Out of all of the plastic in the Great Pacific Garbage Patch, synthetic fishing nets make up nearly half the mass of the entire area (National Geographic, n.d.). While the most well-known aspect is the plastic on the water, approximately 70% of the marine debris has sunk to the bottom of the ocean (National Geographic, n.d.).

Since the Great Pacific Garbage Patch is far from any country's coastline, no state will take responsibility or provide the necessary funding needed to remedy the patch. While there are global advocacy groups, such as Plastic Pollution Coalition and the Plastic Oceans Foundation, who are attempting to raise awareness of the issue, it will take a multinational strategy to clean the Great Pacific Garbage Patch.

Due to the various marine pollutants and causes, along with different monitoring and enforcement measures, it is difficult to track polluters and pollution and implement actionable policies. Furthermore, due to the various actors, such as private companies, local governments, and local civilians, who all have different motivations, delegates must balance properly addressing the effects of maritime pollution and stakeholder opinion. Delegates are called upon to look beyond and build upon the previous and current measures being taken to solve this problem from various angles and innovative solutions. While marine pollution affects every person and ecosystem, delegates must not forget to identify the people and ecosystems who are more vulnerable.

Directives / QARMAs

In this section, delegates will find questions to guide further research. It is recommended for delegates to dig deeper than what is presented in the Background Guide and the Questions to Consider section.

What specific ecosystems and regions of the world are most vulnerable to maritime pollution, and what policy mechanisms and action plans should be drafted to address pollutants in these areas?

How should economic prosperity be balanced with environmental health and justice? Furthermore, how should transnational companies be held liable for any environmental harm caused?

In cases of larger-scale maritime pollution, such as in the air/across a large body of water, who should have to remedy the detrimental environmental impact caused?

How can Member States partner with civilians, advocacy organizations, and other stakeholders to remedy types of maritime pollution?

How can we ensure that accurate and timely information is collected and stored about pollutants?

What measures can be put into place on the local, national, and global scale to ensure enforcement of environmental protection regulations?

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