



Rhodes MRC High School Edition 2026

Study Guide

for

Our Planet Summit

**Topic Area: "Greening the AI Revolution: Addressing the Environmental
Impact of Artificial Intelligence"**

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1. Welcoming Letter

It is with immense honor and excitement that we welcome you to Rhodes MRC High School Edition 2026, and specifically to the Our Planet Summit. This year's focus, "Greening the AI Revolution: Addressing the Environmental Impact of Artificial Intelligence", addresses a critical priority on the global agenda.

As the Board of the Our Planet Summit, we have prepared this document to serve as a guide for your study and preparation. We hope it will be a valuable resource, deepening your understanding of the complex issues at hand and inspiring you to undertake further independent research. The Our Planet Summit is a platform that convenes nations and stakeholders to foster crucial dialogue and action on pressing environmental challenges. Your role will be to embody this spirit, driving forward initiatives and collaborations that address critical environmental concerns such as combating climate change, protecting biodiversity, and promoting sustainable resource management.

This year, we eagerly anticipate your transformation into representatives, ready to engage in robust debate, forge meaningful collaborations, and arrive at impactful conclusions. We envision committee proceedings characterized by intellectual rigor, passionate discourse, and the highest standards of professionalism.

Please do not hesitate to contact us should you have any questions. We are truly looking forward to welcoming you to Rhodes this year for an unforgettable Rhodes MRC High School Edition experience. Prepare yourselves for an extraordinary journey!

Kind Regards,

The Board of the Our Planet Summit

Dimitrios Antonogeorgos, President

Angeliki Koutsourelis, Secretary General

2. Introduction to the Our Planet Summit

Our Planet Summit (OPS) is an international initiative launched in 2017 by the French government in partnership with organizations such as the United Nations and the World Bank, to address pressing global environmental challenges, including climate change, biodiversity loss, and ecosystem degradation.¹ The Summit serves as a collaborative platform, bringing together heads of state, industry leaders, environmental organizations, and civil society to share solutions, review progress, and announce new commitments that accelerate climate action and environmental sustainability. The OPS operates through specialized working groups and sessions that focus on diverse aspects of environmental issues, fostering cross-sector dialogue and innovation.

The committee's primary mandate is to facilitate high-level dialogue, encourage cooperation among stakeholders, and track the advancement of voluntary environmental commitments. Unlike regulatory bodies such as the United Nations Environment Programme (UNEP), OPS do not have the authority to enforce binding regulations, instead relying on the voluntary pledges



and collaborative efforts of participating nations and organizations. In this simulation, the Our Planet Summit will concentrate on the urgent issue of sustainable Artificial Intelligence usage, with

delegates tasked to develop creative policy recommendations and practical initiatives to ensure responsible use, conservation, and equitable distribution of global resources.² The committee aims to stimulate the adoption of effective measures that address the socio-economic and environmental dimensions of global AI challenges. While OPS cannot pass binding documents, it plays a vital role in inspiring real-world change by convening diverse actors and generating actionable recommendations to mitigate the ecological footprint of

¹ "One Health Summit Homepage | One Planet Summit," n.d. <https://oneplanetsummit.fr/en>.

² Ibid

digital technologies, promote sustainable computing practices, and ensure that the AI revolution aligns with global environmental preservation.

3. Introduction to the Topic Area

Artificial Intelligence (AI) is a vital and recent technological development. The countless opportunities that have emerged from the rise of artificial intelligence have simplified professions and daily life. While advances in employee productivity and scientific research have made the application of powerful AI models feasible, the environmental unsustainability of these models has come to

the spotlight, underlining the fact that addressing it still remains challenging. The data centers that host and power these models require enormous amounts of electricity, resulting in



carbon dioxide emissions. Furthermore, large amounts of water are required to cool the hardware used to train, develop, and fine-tune generative AI models, potentially placing a significant burden on municipal water supplies and disrupting local ecosystems. It has been estimated that for every kilowatt-hour of energy consumed by a data center, 1.9 kilowatt-hours of water are required for cooling.³

“When we think about the environmental impact of generative AI, it’s not just the electricity consumption when plugging in your computer. There are far broader consequences that extend to the system level and persist based on the actions we take,” says Elsa A. Olivetti, a professor in MIT’s Department of Materials Science and Engineering.⁴ Based on the IEA’s April 2025 report titled “Energy and Artificial Intelligence,” the newly published analysis finds that the sector continues to evolve at a rapid pace. The capital expenditures of five major

³ A review of green artificial intelligence: Towards a more sustainable future, <https://www.sciencedirect.com/science/article/pii/S0925231224008671>

⁴ Zewe, Adam. “Explained: Generative AI’s Environmental Impact.” MIT News. Massachusetts Institute of Technology, January 17, 2025 <https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117>

technology companies, driven by investments in data centers, rose to over \$400 billion in 2025 and are expected to increase by 75% in 2026. Electricity demand from data centers rose by 17% in 2025, while demand from data centers focused on AI grew even faster—far outpacing the 3% increase in global electricity demand.

In line with the report “Key Questions on Energy and AI”⁵ power consumption per unit of AI work is falling rapidly, with efficiency improving at a rate unprecedented in the history of energy. However, an increasing number of people are using the Internet, and energy-intensive uses such as web applications are on the rise. As a result, electricity consumption by data centers is expected to double by 2030, while power consumption by those focused on AI is expected to triple.

Consideration must also be given to the enormous quantities of fossil fuels needed to meet such high electricity demands. Furthermore, minerals, in particular, are needed for the manufacture of computer components, a process that involves polluting mining practices and use of toxic chemicals. In the majority of cases, artificial intelligence models have a brief lifespan due to emerging applications. Therefore, these models are replaced within a span of several weeks, resulting in the waste of resources.

Of concern is the lack of a global, environmentally sustainable plan or regulation for the production and operation of artificial intelligence, making AI one of the more significant challenges. Regional initiatives, such as the EU’s AI Act, serve as a starting point, but the international community continues to lag behind. The resulting regulatory gaps allow companies to act with impunity. Therefore, the “Our Planet” Summit is called upon to address this situation while respecting international law.

4. Key-words and Definitions

Accelerated Servers:⁶ It refers to the utilization of specialized hardware that accelerates tasks with parallel processing, which minimizes frequently occurring tasks. It helps process heavy

⁵ IEA (2026), *Key Questions on Energy and AI: Executive Summary*, <https://www.iea.org/reports/key-questions-on-energy-and-ai/executive-summary>

⁶ Merritt, Rick. “What Is Accelerated Computing?” NVIDIA, Blog, September 1, 2021. <https://blogs.nvidia.com/blog/what-is-accelerated-computing/>.

tasks that can hinder the work of central processing units. As a result, it is more energy efficient and explains why it is described as “sustainable computing”.

Carbon offsets:⁷ Tradable rights (certificates or carbon offsets) are certificates that are linked to activities that reduce carbon dioxide (CO₂) in our atmosphere. These offsets allow individuals or organizations to fund climate change mitigation projects without necessarily having to reduce their own CO₂ output and thereby compensate for their own CO₂ emissions by preventing the release of an equal amount of CO₂ from somewhere else.

Data centers:⁸ They are facilities that enable the operation of IT services, processing and delivering applications and services, while saving and managing the data produced. In recent times, software-defined data centers (SDDC) were introduced that virtualize infrastructure elements and provide them as a service, thereby improving performance and costs.

Digital colonialism:⁹ It refers to the continuation of colonial logics through digital technologies, where dominant technology firms – primarily based in the Global North – control digital infrastructures, software, and data flows, thereby maintaining economic, political, and cultural hegemony over developing regions.

Electrical and Electronic Waste or E-Waste:¹⁰ It indicates the waste produced by the components, subassemblies and consumables of electrical and electronic equipment. According to the *Basel Convention*, they are categorized as both hazardous and non-hazardous. This is determined from Annex I and Annex III accordingly. For instance, if the waste consists of mercury and lead, which are toxic substances according to Annex III, it is categorized as hazardous.

⁷ Massachusetts Institute of Technology (MIT), “Carbon Offsets,” *MIT Climate Portal*, <https://climate.mit.edu/explainers/carbon-offsets>.

⁸ Susnjara, Stephanie, and Ian Smalley. “What Is a Data Center?” *Ibm.com*, September 4, 2024. <https://www.ibm.com/think/topics/data-centers>.

⁹ Yılmaz, Özgür and İbn Haldun University. “Digital Colonialism, Ecological Crisis and the Limits of Techno-Primitivism.” *tripleC*. Vol. 338–359, November 24, 2025. <http://www.triple-c.at>.

¹⁰ United Nations Office for Disaster Risk Reduction (UNDRR), & International Science Council (ISC). “Electronic Waste (E-Waste).” *Undrr.org*, June 7, 2023. <https://www.undrr.org/understanding-disaster-risk/terminology/hips/tl0507>.

Global Environmental Governance Gap:¹¹ It refers to the absence of binding and harmonized international environmental regulations, leading to fragmented policy approaches and inconsistent enforcement across countries. This gap enables practices such as regulatory arbitrage and carbon leakage, and ultimately limits the effectiveness of global efforts to address environmental challenges collectively.

Inference Phase:¹² It constitutes the procedure where trained AI models use their initial training in order to provide a conclusion based on the new data provided by the user. Training and inference are two different aspects of AI development. Training is trial and error, while supplying it with examples, whereas inference is the process for the final product. The better the initial phase, the more accurate the result.

Race to the Bottom:¹³ It is a process where countries lower environmental regulations so that they will be able to attract foreign investment and remain competitive with other countries in the global economy. Consequently, this generally reduces the protection of the environment and prioritizes economic gain over long-term sustainability. It is driven by a lack of coordinated international environmental rules.

Regulatory Arbitrage:¹⁴ It refers to the practice of companies relocating their operations to countries with weaker environmental regulations in order to reduce costs and avoid stricter compliance obligations, while maintaining higher profit margins. This results in the shifting of environmental burdens rather than their actual reduction, as companies strategically exploit differences in regulatory frameworks across jurisdictions.

Tailing:¹⁵ It refers to the waste stream resulting from the separation of the ore from the commodity of value through processing by a mill or plant. This by-product of mining usually has a sand-like or clay-like consistency. Its value depends on technological improvement and market conditions, which might result in its reprocessing.

¹¹ United Nations Environment Programme (UNEP), "Digital Transformation and Environmental Sustainability," 2019, <https://www.unep.org/resources/report/digital-transformation-and-environmental-sustainability>.

¹² Cloudflare.com. "AI Inference vs. Training: What Is AI Inference?," 2024. <https://www.cloudflare.com/learning/ai/inference-vs-training/>.

¹³ Cornell Law School, "Race to the Bottom," *Legal Information Institute*, https://www.law.cornell.edu/wex/race_to_the_bottom.

¹⁴ Organisation for Economic Co-operation and Development (OECD), "Digital Government and AI Policy Frameworks," <https://www.oecd.org/digital/>.

¹⁵ SME. "What Are Tailings ." *www.smenet.org*. Accessed April 21, 2026. <https://www.smenet.org/What-We-Do/Technical-Briefings/What-are-Tailings>.

Water consumption:¹⁶ In this context, it is the water consumption footprint (WCF) of data centers, more specifically, the amount of water “*evaporated, transpired, incorporated into products or crops, or otherwise removed from the immediate water environment*”, which might cause water exhaustion, especially in water-scarce areas.

5. Legal Framework

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

The Basel Convention, which entered into force in 1992, aims at the regulation of hazardous wastes, mitigates the environmental risks at the place of disposal, bans “toxic trade” – the transboundary movement of hazardous waste- and provides regulatory oversight on bi- and multilateral agreements on transboundary movements. Its main objective is the protection of human health and the disposal of wastes is performed in an environmentally sound manner.¹² According to the Convention, “*Wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law*”, examples of which are mercury and lead, as described in the Annexes. More specifically, the 2025 revised text of the Convention includes electrical and electronic waste.¹⁷

Paris Agreement

The Paris Agreement is a legally binding international treaty on climate change, with 194 signatories. The main aim is to limit the global average temperature to below 2°C above preindustrial levels and to mitigate the increase to 1.5°C above pre-industrial levels. It operates in five-year cycles, when economic and social transformation and submission of nationally determined contributions are required. Financial, technical and capacity-building support is provided by developed countries in order to achieve a cohesive carbon neutrality strategy.¹⁸

¹⁶ Li, Pengfei, Jianyi Yang, Mohammad Islam, and Shaolei Ren. “Making AI Less ‘Thirsty’: Uncovering and Addressing the Secret Water Footprint of AI Models,” March 26, 2025. <https://arxiv.org/pdf/2304.03271>

¹⁷ The Basel Convention. “Text of the Convention.” www.basel.int. Accessed March 30, 2026.

¹⁸ UNFCCC. “The Paris Agreement.” United Nations Climate Change, 2025. <https://unfccc.int/process-and-meetings/the-paris-agreement>.

Kyoto Protocol

The Kyoto Protocol aims at the reduction and limitation of greenhouse gas emissions. It serves as the enactment of the United Nations Framework Convention on Climate Change and binds specifically industrialized countries. Currently, it binds 38 countries and economies, including the European Union. The protocol provides monitoring and flexible market mechanisms in order to ensure the targets are met, through national reports, and for a safe market transition, through the Clean Development Mechanism (CDM) and the Joint Implementation (JI).¹⁹

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)

The Water Convention is the main legal instrument ensuring the sustainable use of global water sources. With more than 110 signatory countries, this Convention remains one of the most relevant platforms that ensures water cooperation, while not substituting for intergovernmental agreements. It consists of three pillars: “Prevent, Control and Reduce Transboundary Impacts”, “Ensure reasonable and Equitable Use”, “Cooperate Through Agreements and Joint Bodies”. These pillars bind signatories to manage and reduce transboundary impacts and use water sources mindfully.²⁰

European Union Artificial Intelligence Act (EU AI Act)

The European Union Artificial Intelligence Act is a binding regulatory frameworks concerning the use of AI and sets some standards for the classification of AI work. To be more exact, it divides into three categories: “*unacceptable risk*”, “*high-risk applications*” and “*transparency/minimal risk*”.²¹ The Act incorporates provisions for energy reduction and resource consumption to ensure protection of the environment, biodiversity and climate change, constant supervision and close monitoring of AI’s life cycle, which targets heavily

¹⁹ United Nations Climate Change. “The Kyoto Protocol.” Unfccc.int, 2022. <https://unfccc.int/process-and-meetings/the-kyoto-protocol>.

²⁰ United Nations Economic Commission for Europe. “The Water Convention: Responding to Global Water Challenges Convention on the Protection and Use of Transboundary Watercourses and International Lakes,” May 27, 2021. https://unece.org/sites/default/files/2021-04/ECE_MP.WAT_52_ENG_WEB.pdf.

²¹ EU AI Act. “EU Artificial Intelligence Act | Up-To-Date Developments and Analyses of the EU AI Act.” Artificialintelligenceact.eu, 2024. https://artificialintelligenceact.eu/#weglot_switcher.

systemic, large- scale AI models.²²

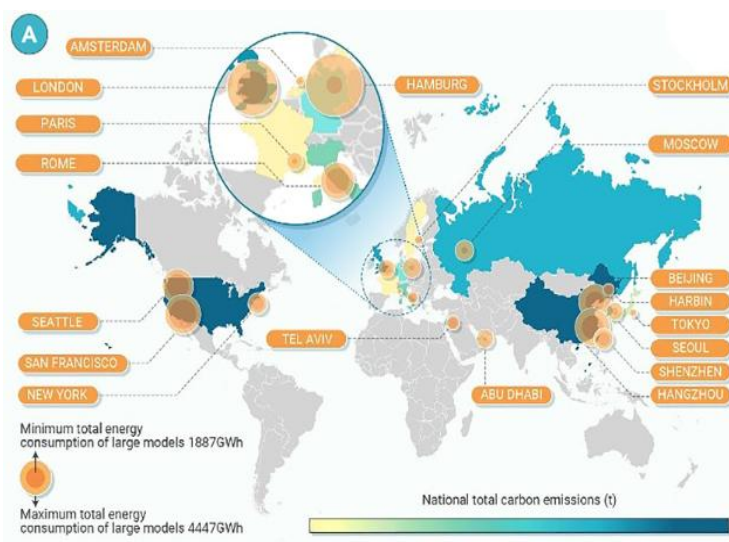
6. Main discussion of the Topic

6.1. Environmental Footprint of AI Systems

6.1.1 Energy Consumption and Carbon Externalities

Data centers are the main powerhouses where artificial intelligence (AI) models are trained. They are composed of storage systems, networking equipment that optimizes performance, cooling and temperature control equipment that ensures prime conditions, uninterruptible power supply (UPS) batteries and backup power generators, servers that process and store data, and other infrastructure, like office equipment, etc. Servers account for 60% of required electricity in these facilities. Due to the rise of AI, high-performance accelerated servers are required, meaning higher power density in data centers. As a result, it is estimated that by 2030, data centers would represent 3% of total global electricity consumption (945 TWh).²³

However, AI's environmental footprint consists of all its greenhouse-gas emissions: from manufacturing, transportation, maintenance, to end-of-life processes, not only in its training



phase. Disregarding the aforementioned emissions underestimates the true cost of AI systems, although they vary according to model scale, deployment frequency, and system architecture. Engineering decisions, such as data-processing frameworks, numerical precision, batch size, and workload

²² Mithika, Dennis. "AI's Environmental Impacts: Emerging Regulations and Policies." DevelopmentAid, October 9, 2025. <https://www.developmentaid.org/news-stream/post/200809/ais-environmental-impacts>.

²³ IEA. "Energy Demand from AI – Energy and AI – Analysis - IEA." IEA, 2025. <https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai>.

scheduling, affect the carbon footprint. In some cases, the inference phase equals or even exceeds the training energy demand, as a metric that most studies fail to consider.²⁴

More importantly, the geographic location of a data center determines the final environmental cost. Most data centers are located in carbon-intensive areas, like China and the US, which are responsible for 99% of global generative AI (GAI) emissions - 6.76- 8.98 million tons and 3.66-8.72 million tons per year, respectively. Even though China hosts more GAI models, its energy consumption is smaller than that of the US. Despite that, due to China's high carbon intensity, it contributes to 54.4% of global carbon emissions. In Europe, where carbon intensity is lower, fewer computational demands are reported, which explains why Europe emits only 0.02-0.09 million tons.^{25 26}

Furthermore, contemporary academic research²⁷ emphasizes that digital infrastructures are deeply physical systems and not merely virtual spaces, the expansion of which is systematically linked to the dynamics of "digital colonialism." As the developed economies of the North, and especially the European Union, impose increasingly strict environmental regulations and transparency standards, multinational tech companies are gradually externalizing their ecological costs. By establishing massive data centers, server farms, and hardware manufacturing facilities in the Global South, these companies are strategically exploiting weaker local regulatory frameworks and high-carbon energy grids. This exploitative model shifts the full environmental burden, such as the rapid depletion of resources, the accumulation of toxic electronic waste, and severe local water scarcity caused by equipment cooling needs, onto marginalized and vulnerable populations. Consequently, rather than achieving true sustainability, this geopolitical shift ensures that the Northern Hemisphere continues to reap the primary informational and economic benefits of the artificial intelligence revolution, while the South bears the disproportionate burden of the devastating ecological consequences. Consequently, AI's carbon footprint is not something that should be viewed

²⁴ Oliveira, Ana Paula, Tânia Carraquico, and Clara Martinez-Perez. "Beyond Efficiency: A Systematic Review of Energy Consumption and Carbon Footprint across the AI Lifecycle." Mdpi.com, January 29, 2026. <https://www.mdpi.com/2071-1050/18/3/1359>

²⁵ Ding, Zhaohao, Jianxiao Wang, Yiyang Song, Xiaokang Zheng, Guannan He, Xiupeng Chen, Tiance Zhang, Wei-Jen Lee, and Jie Song. "Tracking the Carbon Footprint of Global Generative Artificial Intelligence." *The Innovation* 6, no. 5 (February 28, 2025): 100866. <https://doi.org/10.1016/j.xinn.2025.100866>.

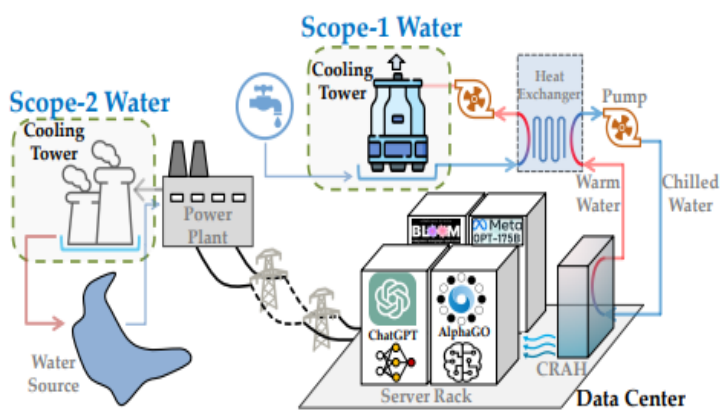
²⁶ Ibid.

²⁷ Yilmaz, Özgür and İbn Haldun University. "Digital Colonialism, Ecological Crisis and the Limits of Techno-Primitivism." *tripleC*. Vol. 338–359, November 24, 2025. <http://www.triple-c.at>.

solely on an operational level, especially when all other aspects together rival the training-required energy. For that reason, reports and transparency requirements for all aspects of its life cycle could optimize monitoring and sustainable distribution of energy demand globally.

6.1.2 Water Usage and Resource Competition

It is speculated that large data centers consume up to 5 million gallons per day to cool processor chips, equivalent to the water use of a town of 10 to 50 thousand people - a metric bound to change as demand for newer and more complex artificial intelligence models is rising. A data center's water consumption is calculated by three aspects: on- site water usage,



water used by the energy suppliers and water used while manufacturing processor chips. Blue sources, like surface water and groundwater, piped sources and grey sources, such as purified reclaimed water, constitute the main sources of water. In drier

areas, using recycled or non-potable water for such operations is a common practice. The average water usage effectiveness - *“a data center’s total water consumption, measured in liters, is divided by the total energy consumed by that data center in kilowatt-hours in the same time period”* - is 1.9 liters per kWh, unlike the hopeful 0 score, which is achieved solely by air-cooled data centers.

Cooling a data center is a complex procedure and takes into consideration numerous aspects like location, climate, water scarcity, dimensions of the facility and IT rack chip densities. In areas where the number of data centers is dense, more chips are required and therefore, higher room temperatures are produced. As a result, more water chillers and on-site cooling towers are built. 80% of the water used evaporates due to high temperatures, while the rest is discarded to municipal infrastructure, which, in most cases, is unable to process such a high volume.

An indirect use of water in data centers is electricity from power facilities. Those have boilers

that produce high-pressure steam, which rotates a turbine and generates electricity. This practice constitutes an important use of fresh water, especially in dry areas and in the summer. For example, in the United States, an estimated 211 billion gallons were allocated in 2023 for this purpose.

As mentioned before, the water used in the initial manufacturing of memory chips, graphics processing units (GPUs) and central processing units (CPUs) is also accounted for. Moreover, ultrapure water is perfect for cleaning, etching and rinsing chips during production. Therefore, approximately 10 million gallons of ultrapure water per day -around 15 million gallons of piped water- are consumed by an average chip manufacturing facility.²⁸

Most data centers are constructed in already water-stressed areas, especially in the US, where around 72% of newer infrastructure is located in such areas. Consequently, this practice poses a risk to local water supplies, agriculture, and energy production. This is a growing trend outside of the US, with countries like the Netherlands, Uruguay, and Chile facing immense opposition from the public. Microsoft Corporation seems to rethink the strategy and is actively pausing or/and canceling the creation of data centers in drought-prone areas.²⁹

6.2 Resource Extraction and Material Dependency

Artificial Intelligence has a substantial toll on earth minerals, like lithium, cobalt, nickel, etc., which are crucial for semiconductors, batteries, and data storage. The issue starts from the extraction all the way to the refining and final production of the materials. The consequences of the high-temperature processes, chemical treatments, and large-scale water use are usually not immediately visible or equally distributed. Air pollution, water scarcity, and industrial waste burden only the community close to the industrial zone with public health issues, land viability, or ecological catastrophe.

Moreover, mining activities require a reformation of the surrounding ecosystem, achieved through deforestation, disruption of soil layers, and alteration of water flows. This practice

²⁸ Yañez-Barnuevo, Miguel. "Data Centers and Water Consumption." Eesi.org, June 25, 2025. <https://www.eesi.org/articles/view/data-centers-and-water-consumption>.

²⁹ Nicoletti, Leonardo, Michelle Ma, and Dina Bass. "How AI Demand Is Draining Local Water Supplies." Bloomberg.com. Bloomberg, May 8, 2025. <https://www.bloomberg.com/graphics/2025-ai-impacts-data-centers-water-data/>.

causes an ecological breakdown, especially in climate-sensitive areas.³⁰ As around 45% of mining activities are performed in forest areas, mineral-rich countries like Indonesia, Brazil, Ghana and Suriname experience intense deforestation due to mining activities.

Not only that, but contamination of the surface and groundwater is observed as water sources are sensitive to pH levels, discarded heavy metals and other by-products of mining. When mining products are not correctly disposed of, tailings are left, which contain toxic compounds like mercury and other radioactive materials. In some cases, a dam is made that is not properly treated, hoping that it will not leak into the ecosystem. In such a scenario, when a leakage happens, erosion, sinkholes and contamination are observed. Therefore, communities' food systems, ecological resilience and livelihoods are ultimately affected.³¹

For example, in the Democratic Republic of Congo (DRC), artisanal and small-scale mining is performed, which has direct environmental consequences. In 2024, 62 incidents were reported about mercury contamination, water pollution and deforestation. In northwest Congo, especially in Ituri, clean water is scarce and in Haut-Uele communities and wildlife is displaced due to deforestation.³² Consequently, it is clear that mineral extraction has a direct impact and is a main contributor to ecological catastrophes.

6.3 Electronic Waste and Long-Term Environmental Risks

With the demand for artificial intelligence (AI) models increasing, newer electronic equipment is needed to host the advanced chips, accumulating tons of e-waste. A study showed that by 2030, large language models (LLMs) would produce 2.5 million tons of e-waste alone, endangering nearby ecosystems and human health.³³ As e-waste is toxic, non-biodegradable, and concentrated in the environment from improper handling, it exposes

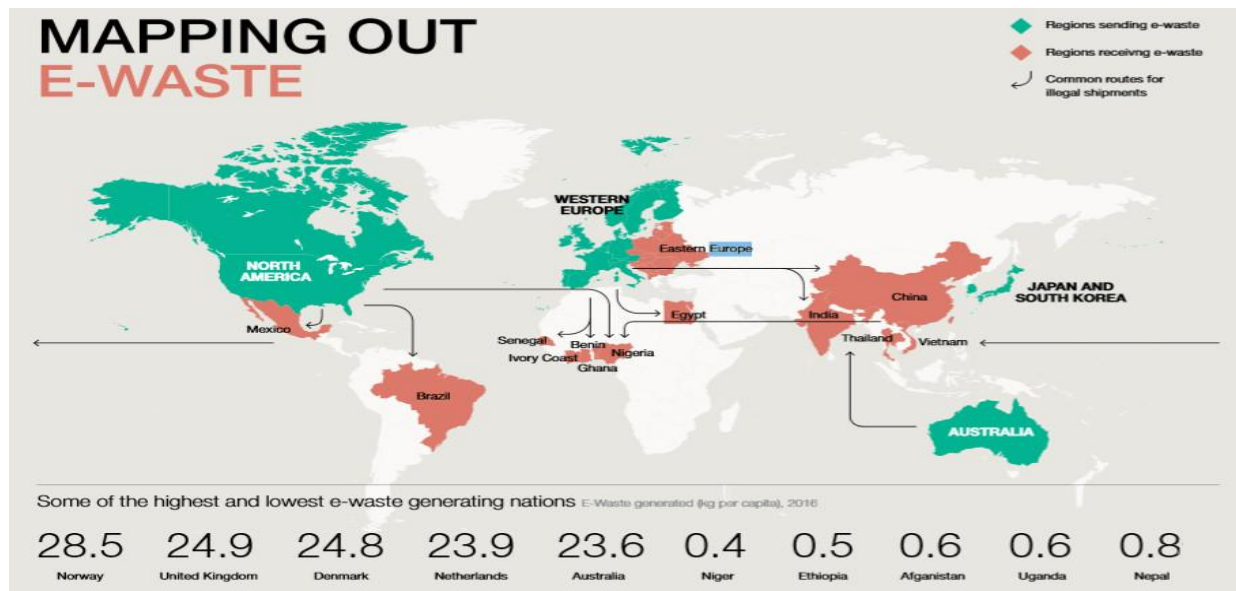
³⁰ Planetary Justice Alliance. "Raw Material Extraction." AI + Planetary Justice Alliance, 2019. <https://aiplanetaryjustice.com/research-areas/raw-material-extraction>.

³¹ Hühne, Fabian. "How Does Metal Mining for Electronics Impact the Climate Crisis?" Syllucid.com, January 23, 2023. <https://syllucid.com/blogs/news/how-does-metal-mining-for-electronics-impact-the-climate-crisis?srltid=AfmBOopq3fdxHAcHSCoWt6ag8jfqMewKuYyWk5BelEtaux6zY3VU47bW>.

³² Walschot, Maureen. "Mineral Extraction, Environmental Harm, and Conflict: The Role of EU Due Diligence in Promoting Sustainable Practices in Conflict Hotspots." IPIS, April 16, 2025. <https://ipisresearch.be/weekly-briefing/mineral-extraction-environmental-harm-and-conflict-the-role-of-eu-due-diligence-in-promoting-sustainable-practices-in-conflict-hotspots/>.

³³ Bourzac, Katherine. "Generative AI Has a Massive E-Waste Problem." IEEE Spectrum, November 4, 2024. <https://spectrum.ieee.org/e-waste>.

workers to harmful minerals, like lead, mercury, beryllium and arsenic. Practices like open-air burning and acid baths to recover the materials used in electronic equipment release chemicals that linger in the air, the soil and the water. Consequently, irreversible health effects, such as cancers, miscarriages, neurological damage and diminished IQs, are prone to appear in nearby communities.



When recycling materials improperly, scarce raw materials are wasted in an effort to be preserved. However, no proper energy is allocated to extract these materials sustainably. For example, recovery rates for cobalt are at 30%, despite the fact that a rate of 95% is achievable if the existing technology were used. Sadly, only 20% of e-waste is properly recycled, while the EU performs slightly better, recycling around 35% of its e-waste. This could be attributed to the fact that more complex devices are released, which makes recycling and recovering a more tedious and expensive process. Therefore, most e-waste is traded or buried in the ground illegally, even though, according to the *Geneva Environmental Network*, recycled metals are more energy efficient than newly mined ones.^{34 35}

In the context of AI, the hardware has a lifespan of two to five years, as it is constantly replaced due to the growing demand and the more efficient versions released. Nonetheless, AI components are difficult to recycle, as they contain personal client data. Big companies are

³⁴ Geneva Environment Network. "The Growing Environmental Risks of E-Waste." Geneva Environment Network, October 9, 2024. <https://www.genevaenvironmentnetwork.org/resources/updates/the-growing-environmental-risks-of-e-waste/>

³⁵ Ibid.

able both to properly discard the data and recycle the electronics, but according to Kees Baldé, an e-waste researcher at the U.N. Institute for Training and Research, *“the gains for society are much larger”*.³⁶

6.4 Governance Gaps and Regulatory Arbitrage

A lack of established international arrangements regarding binding and harmonizing regulations and standards for the environment contributes to what many refer to as a race to the bottom, which is the competitive process that occurs when countries lower their regulatory requirements (most often related to environmental protection) to draw in foreign investment and remain economically competitive in a globalized economy.³⁷ In this environment, stringent environmental regulation can be viewed as an impediment, leading to government efforts to reduce the strength of existing regulations or to avoid implementing more vigorous regulatory requirements altogether.

Regulatory arbitrage is strongly associated with the practice of companies shifting their operations to countries that have less strict environmental regulations. Many companies in environmentally-heavy sectors like energy production, manufacturing, and data infrastructure will choose to locate in areas where they can greatly reduce their compliance costs, enforceability of regulations, or reliance on fossil fuels.³⁸ Ultimately, the external effects of environmental issues such as carbon emissions and depletion of natural resources are shifted from one country to another, as opposed to being globally decreased, thus ultimately undermining global and/or regional sustainability policies.

³⁶ Iqbal, Saima. “Generative AI Is Poised to Worsen the E-Waste Crisis.” *Scientificamerican.com*, November 14, 2024. <https://www.scientificamerican.com/article/generative-ai-could-generate-millions-more-tons-of-e-waste-by-2030/>.

³⁷ Cornell Law School, “Race to the Bottom,” *Legal Information Institute*, accessed 2026, https://www.law.cornell.edu/wex/race_to_the_bottom.

³⁸ Organisation for Economic Co-operation and Development (OECD), *Regulatory Policy Outlook 2021*, OECD Publishing, 2021, <https://www.oecd.org/gov/regulatory-policy/>.

The global manifestations of a "race to the bottom" result in major systemic issues. They create an uneven playing field between countries or businesses with higher-standard



regulations versus those with lower-standard regulations³⁹ in addition to environmental damage and increased greenhouse gases. Moreover, the tendency to encourage developing nations to become destinations for ecologically damaging business activities due to lacking

controls or legislative authority reinforces the growing inequity among nations. This ongoing situation is symptomatic of the deficiencies of a fragmented governance system and also reinforces the need for enhanced cooperation and binding global environmental regulation.⁴⁰

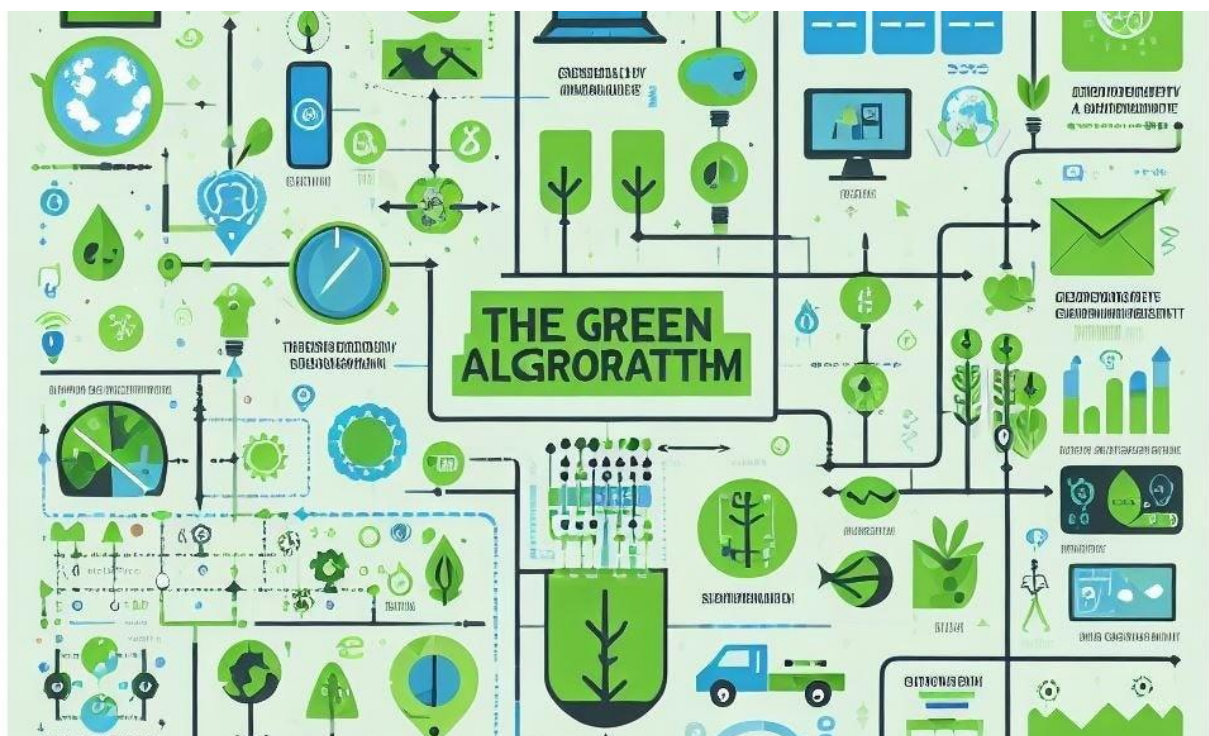
6.5 Past Actions and Current Developments

The way that businesses have committed to climate initiatives and have made substantial advancements in green technologies over the last few years has had a significant influence on the development of the global sustainability agenda. There are also considerable governance and structural issues that impede the effectiveness of these commitments when implemented in practice.

³⁹ United Nations Environment Programme (UNEP), "Digital Transformation and Environmental Sustainability," 2019, <https://www.unep.org/resources/report/digital-transformation-and-environmental-sustainability>.

⁴⁰ United Nations Conference on Trade and Development (UNCTAD), *Digital Economy Report 2021*, UNCTAD, 2021, <https://unctad.org/publication/digital-economy-report-2021>.

Corporate greenwashing practices related to climate strategy are becoming an important issue, especially with regard to how many businesses have made formal pledges to be carbon neutral, which typically use a great number of carbon offsets to fulfil those commitments, rather than by reducing their own emissions. Carbon offsetting includes purchasing carbon credits and/or supporting external environmental initiatives instead of directly reducing emissions through the structural decarbonization of core business operations. Carbon offsets can be a complementary part of an organization's mitigation strategy; however, increasing emphasis has been placed on the fact that they are not a replacement for reducing actual emissions.



The European Commission has expressed a desire to promote stricter rules and regulations concerning claims made about an organization's sustainability in order to promote transparency and reduce misleading or inaccurate information, while at the same time enhancing the need for accurate verification through science-based reporting standards.⁴¹

The transition from traditional sources of energy to low-carbon technologies faces several fiscal and implementation barriers. Technological advancements, such as energy-efficient Semiconductor Systems, advanced Cooling technology for Data Centers and optimised Digital Infrastructure, have been identified as key technologies to help reduce Green House Gas

⁴¹ European Commission, "Proposal for a Directive on Green Claims (COM/2023/166 final)," 2023, https://environment.ec.europa.eu/publications/proposal-directive-green-claims_en.

emissions from both the Information and Communication Technology (ICT) and Industrial sectors. However, these technologies have yet to achieve widespread adoption because of significant upfront capital costs and a lack of sufficient financial incentives. The IEA suggests that many of the available energy-efficient technology options are cost-effective over the lifecycle of the technology; however, the primary reason for slow market adoption of energy-efficient technologies is the existing barriers to initial investment and the fragmented nature of policy support.⁴²

As far as policy is concerned, these developments reveal a twofold challenge: establishing the credibility of corporate climate pledges and expediting the distribution of already existing green tech. From a policy standpoint, enhancing rules on environmental claims, improving standards for corporate reporting of information, and broadening financial incentives designed to assist green businesses are viewed as key policy vehicles. Also, the IPCC has asserted that to stay on target with global average temperature limits, existing mitigation technologies must be deployed quickly and at a large scale.

Reference should equally be made to the “Jevons paradox”⁴³ (a subcategory of the rebound effect), which assesses the impact of adopting Artificial Intelligence (AI) on both the intensity of carbon emissions (CEI) and total carbon emissions (TCE), using firm-level data from companies listed on China’s A-share market. Despite the fact that the adoption of AI significantly reduces CEI, this leads to an increase in TCE. In simple terms, as AI becomes cheaper and more efficient, humanity uses it exponentially more, leading to a net increase in total pollution despite individual efficiency gains. An analysis of the mechanism behind these results indicates that this paradox is the result of three key factors. AI enhances corporate productivity, promotes green innovation (by reducing CEI), and significantly increases corporate costs and market scale, leading to an exponential increase in total output. Thus, global demand depends exponentially on low-cost technology, with the ultimate result being an increased environmental impact. This can be observed in various business sectors, starting with state-owned enterprises that seek to reduce their carbon intensity (CEI), in contrast to

⁴² International Energy Agency (IEA), “Data Centres and Data Transmission Networks,” 2023, <https://www.iea.org/reports/data-centres-and-data-transmission-networks>.

⁴³ Yu, Dongyang, and Bingjie Xu. “The Jevons Paradox in the AI Era: Artificial Intelligence Adoption for Enhancing Environmental Sustainability at the Firm Level.” *Economic Analysis and Policy* 90 (January 28, 2026): 946–66. <https://doi.org/10.1016/j.eap.2026.01.060>.

high-tech industrial firms that increase both their carbon intensity and total carbon emissions (TCE). Therefore, there is a clear need to establish and adopt legal, economic, and behavioral measures⁴⁴ as a potential solution to the governance gap that arises (from the international strategy, COP30 and COP31) due to the failure to anticipate this rebound, in order to avoid the link between rising emissions and technological progress.

7. Key Stakeholders

Governments: State actors that are most important to balancing the protection of the economy, preserving competitive industries and protecting the environment are national governments, like the governments of the EU Member States, the U.S. and China. The national governments in most of the developed economies are focused more on innovation, energy independence and expanding their economies; in many cases, however, this focus does result in the lessened or delayed application of environmental laws. Differences in national priorities and levels of economic development have also led to disparate international policies on climate change and inconsistent environmental standards in various areas of the world.⁴⁵

International Organizations: The United Nations Framework Convention on Climate Change, United Nations Environment Programme, and Intergovernmental Panel on Climate Change are three examples of international organizations that promote cooperation among nations to protect the environment and facilitate an international dialogue regarding climate change; coordinate intergovernmental negotiations on climate; and facilitate scientific assessments of climate impacts and provide scientific data upon which to develop policy recommendations concerning climate change. International organizations operate on voluntary cooperation by member states, have little direct authority, and have no reliable mechanism to enforce compliance with their recommendations. Consequently, the lack of political will and disagreement among poor and wealthy countries has compromised the efficacy of international environmental agreements and has delayed fulfilment by nations of global climate obligations.⁴⁶

⁴⁴ Jaume Freire-González and Ignasi Puig-Ventosa, "Energy Efficiency Policies and the Jevons Paradox," *International Journal of Energy Economics and Policy* 5, no. 1 (2015): 69–79.

⁴⁵ United Nations Framework Convention on Climate Change (UNFCCC), "What is the United Nations Framework Convention on Climate Change?", UNFCCC Official Website, <https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change>

⁴⁶ United Nations Environment Programme (UNEP), Global Environment Outlook 2024, 2024.

Technology Companies: The major resource consumption of technology firms is primarily driven by their provision of digital infrastructure and other systems that consume tremendous amounts of energy, such as data centers. Due to the financial profit motive behind the creation and operation of technology firms, there are currently some misalignments between corporate decision-making and environmentally sustainable decision-making (i.e., long-term goals). However, technology firms also have the potential to drive the adoption of greener technology and to increase the efficiency of energy consumption in all segments composed by its customers.⁴⁷

European Union (EU): A global leader in regulating the environment and creating a climate governance framework for its members due to initiatives such as the European Green Deal and the Artificial Intelligence Act (AI Act). These initiatives have set ambitious goals for sustainability, emission reduction and the environmentally responsible development of technology by member states. The EU also plays an important role on the global stage by virtue of the “Brussels Effect,” where companies and third countries adopt European regulatory standards for access to the European market. Nonetheless, without broader international cooperation and more effective enforcement mechanisms outside its borders, the EU has a limited ability to ensure compliance with global environmental regulations.⁴⁸

Local Communities, NGOs, and Academic Institutions: Communities, especially those living adjacent to industrial or extractive activities, have been directly impacted by environmental degradation yet are often excluded from the decision-making process. NGOs can support the advocacy effort as well as the environmental monitoring effort; academic institutions can provide research and data that is helpful in being able to create science-based policy. However, the “research-policy disconnect” creates barriers for translating science knowledge into the policies needed to implement changes to mitigate environmental harm.⁴⁹

<https://www.unep.org/resources/global-environment-outlook-2024>

⁴⁷ International Energy Agency (IEA), “Data Centres and Data Transmission Networks,” 2023, <https://www.iea.org/reports/data-centres-and-data-transmission-networks>.

⁴⁸ European Commission, “Proposal for a Directive on Green Claims (COM/2023/166 final),” 2023, https://environment.ec.europa.eu/publications/proposal-directive-green-claims_en.

⁴⁹ World Bank, *World Development Report 2021: Data for Better Lives*, 2021, <https://www.worldbank.org/en/publication/wdr2021>.

8. Conclusion

While AI is developing quickly, it also creates a big technical development and a huge environmental paradox since digital development needs to be supported through a heavy tax on land. A good example of this large environmental footprint by digital development is due to the amount of energy being consumed by growing numbers of server/data centre companies and the massive volumes of water used for cooling hardware and other components. The other aspect is the large amount of minerals needed to produce the hardware, and the increasing amount of toxic e-waste generated by using hardware. All of these negative ecological issues can be seen after the AI is trained, but they can also be seen throughout their life cycle, and since there is no global industry standard, this dumping will occur in less developed countries with little/no environmental protection. All in all, our committee's work will focus on tackling the aforementioned issues through sustainable and viable solutions

9. Points to be Addressed

1. How can the international community implement monitoring mechanisms to mitigate greenhouse gas emissions and raise awareness and accountability on the carbon footprint of data centers?
2. In what ways can policymakers relieve water-stressed areas from the burden of water usage by data centers?
3. How can correct disposal and recycling of electronic waste be executed, while mitigating illegal dumping and trade?
4. With what measures can sustainability in the extraction of minerals used on AI infrastructure be achieved?
5. Can inconsistency in environmental and AI policies be bridged to achieve a global protocol on AI environmental usage?
6. How can the international community balance geopolitical competition between the United States and China while ensuring fair accountability for global emissions?

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