BIGMUN 2025

ECOSOC 4: Commission on Science and Technology for Development (CSTD)

Research Report

Topic 3: Stressing the issue of energy and water supply used for datacentres.

DENIZ TARHAN & EVA DUZINSCHI

Table of Contents

Introduction

Following the rise of automation and increasingly advanced technology, data centres have been playing a more pivotal role in everyday life. Data centres are beneficial, and crucial, for sustaining companies that rely heavily on technology, since all companies wish to store their data safely. Despite that, there is an emerging issue related to the overuse of energy and water by these specific centres. Since many of these machines inside end up consuming large amounts of heat, and energy, the centre must incorporate a sustainable cooling system.

The system addressed is designed to use water, unfortunately including drinking water, the prevention of overheating and protecting the technology inside. It is a well-known fact that fresh water makes up 3% of earth's water, and humans can only safely consume around 0.5% of that amount. This low amount of water highlights the extent of damage that the high-water consumption of data centres can cause, especially environmentally and socially. This decrease of accessible water, especially to low-income countries, threatens to increase health issues worldwide.

The Environmental Energy Study Institute has discovered that around 5.000.000 gallons of water are usually used by larger sizes of data centres per day. This amount is equal to around as much as 10.000-50.000 people would use, combined. Additionally, medium sized centres' water consumption can add up to 110 million gallons annually.

Along with the water issue, another growing problem is the use of energy. With the accelerated

development of AI models, centres in the United States have been found to have used a near equivalent amount of electricity (in terawatt-hours) as Ireland as a whole. Another astonishing statistic is that training and developing only one large model like ChatGPT generates approximately 5oo metric tons of CO21.

All in all, despite the large number of opportunities data centres have to offer, they always result in a high amount of carbon dioxide emissions increasing the pace of climate change impacts, consuming fossil fuels while reducing the access of necessary energy and water.

Definition of Key Terms

Data Centres: are the main factors behind the issue of heightened water and energy consumption. Data centres use water resources for their cooling systems to ensure the protection of machines that are prone to overheating. Data centres contain many different types of machinery from cooling to computing machines to IT systems. This physical location protects digital data.

PUE and WUE: are the condensed versions of Power Usage Efficiency and Water Usage Efficiency. These are measures that shows how much energy or water consumption is done by a data centre. The terms are crucial to include in this agenda item as one of the key issues of consumption is the lack of efficiency in developing data centres.

Scopes of Emissions: include 3 different levels. Scope 1 refers to the entirety direct and controlled emission whereas Scopes 2 and 3 are indirect emissions from the activities of the utilities. Scope 2 is specifically the indirect emissions of a company generally the energy that has been purchased and Scope 3 is related to the emissions that are not controlled by the utility. Scope 3 has 2 main parts, upstream and downstream. Upstream is emissions used for production of machinery and technology for data centres and downstream is after the purchase. Each scope must be handled with a special degree as the 3 scopes refer to 3 different sides of emission.

Renewable Energy: is a very common term used for safer energy alternatives. From research,

[1] https://www.climateimpact.com/news-insights/insights/carbon-footprint-of-ai/

the negative impacts of fossil fuels have become a pile and for this Renewable energy is the solution. Renewable energy refers to energy that is not limited, for example solar or wind energy. In light of the current problems data centres cause by consuming high amounts energy, specifically fossil fuels, renewable energy must be developed in data centres for more efficient and safe use.

Background Information

The quaternary sector is essentially an umbrella term for all knowledge-based economic activities: ICT, finance, education, consulting, high-tech services, and information-based work. Although AI assists with productivity and efficiency, it can also create risks when its functioning demands efficient data centres/ grids, which rely on an immense amount of water.

AI's, especially large-scale models that require training, expansion has turned into an energy–water security issue, because their systems depend heavily on data centres with high electricity demand, in order to compute, for cooling or power conversion, and significant water demand, often for evaporative cooling, or indirectly through electricity generation's water footprint. The reason why it is now being framed as a threat, is due to the fact that although artificial intelligence is not inherently bad, its unmanaged growth can potentially threaten the quaternary sector by causing electricity prices to increase, it can undermine actual workers in knowledge-based services, can cause water allocation conflicts (industry vs households/agriculture), and political backlash due to new data centre projects either blocked, delayed, or regulated wrongly.

Major Countries and Organisations Involved

United States - Largest hyperscale footprint and fast AI build-out; facing local backlash in water-stressed regions. Strong private sector role; policy tension between growth and resource constraints.

China - Rapid AI and data centre scaling with state-led planning; simultaneously pushing energy efficiency and integration with renewables. Public discussion increasingly links AI expansion with carbon and power constraints.

European Union (and key hubs like Ireland, Netherlands, Nordics) - Dense data centre clusters (cloud hubs) and stricter sustainability governance. Policy focus: efficiency standards, transparency, and aligning with climate goals.

India - Expanding digital public infrastructure and AI adoption; energy access and grid resilience remain core concerns. Likely to prioritise development rights + technology transfer + efficiency support.

Gulf states (UAE, Saudi Arabia, Qatar) - Major AI/data centre investment; high cooling needs; water is often desalinated (energy-intensive), raising energy–water nexus concerns.

Water-stressed or rapidly urbanising states (many in MENA, parts of Africa, parts of Latin America) - Concerned about competition for water and electricity, and whether AI infrastructure diverts resources from human development.

Major organisations and forums

UN General Assembly / ECOSOC - Norm-setting on digital cooperation, sustainable development, and equitable access.

UNEP (UN Environment Programme) - Directly addressing AI's environmental footprint; issued guidance and convenes states on sustainability impacts.

UNESCO - Global ethical framework including environmental and societal impacts of AI.

ITU (International Telecommunication Union) - Technical standards + best practices for greener ICT, including "green data centres."

IEA (International Energy Agency) - Authoritative energy-demand projections used heavily in policy debates.

OECD - Produces policy reviews on ICT/environment and communication networks sustainability; often referenced by governments. (OECD)

Major tech firms (non-state but influential): Google, Microsoft, Amazon, Meta - Set internal targets (PUE/WUE reporting, "water positive," renewable PPAs), and heavily influence norms through procurement and transparency.

Relevant UN Resolutions

UN General Assembly

A/RES/78/265 (1 April 2024) - "Seizing the opportunities of safe, secure and trustworthy AI systems for sustainable development." Broad principles: human rights, inclusive governance, safe deployment. Strong foundation for arguing that "sustainable development" must include infrastructure impacts. (docs.un.org)

A/RES/79/194 (23 Dec 2024) - "Information and communications technologies for sustainable development." Useful to link to data centres are core ICT infrastructure; aligns with SDGs and capacity building. (docs.un.org)

A/RES/79/334 (8 Sept 2025) - Resolution referencing bridging AI/digital divides and enhancing international cooperation. Useful for equity framing: resource burdens shouldn't deepen divides. (docs.un.org)

ECOSOC

E/RES/2024/13 (2 Aug 2024) - Addresses digital cooperation discussions (Road map for digital cooperation, governance proposals, etc.). Useful to justify ECOSOC competence in "digital + development + sustainability" policy coordination. (docs.un.org)

UNEP / UNEA (UN Environment Assembly) - UNEP/EA.7/Res.9 (UNEA-7, adopted 8–12 Dec 2025) – "Environmental sustainability of artificial intelligence systems." It legitimises the AI-environment nexus inside the UN system. (UNEP - UN Environment Programme)

ITU (technical standards that delegates can cite as implementation tools) - ITU-T L.1300 (2014) - best practices for energy-efficient "green data centres." Useful as a policy "solution anchor" (standards, reporting, efficiency benchmarks). (ITU)

Previous Attempts to Address the Issue

Recommendation on the Ethics of AI[2]:

Prepared by UNESCO, the paper has been written as the ground for AI measures all around the world. It includes recommendations related to all areas of Artificial Intelligence providing a clear vision for the safe and ethical use of Artificial Intelligence Models that have been adopted more every year. Policy Area 5 directly relates to the environmental impacts of data centres more closely AI. Named as Environment and Ecosystems, this area focuses on energy consumption and its efficiency, Carbon footprint monitoring and environmental effects of raw material consumption. Its aims also include the implementation of environmental law policies and the compliance to the Paris Agreement which has been a cornerstone for environmental protection and sustainability. Their goals are to reach renewable energy usage and to develop more efficient technologies featuring Artificial Intelligence.

Climate Neutral Data Centre Pact:

Including more than 100 leading data centres, the pact contributes to a more Climate Neutral Europe until 2050.[3] The idea of climate neutral is reaching point where there are zero greenhouse gas emissions. The pact draws attention for purchasing 100% carbon free energy and prioritising water conservation activities. For more sustainable use, the importance of repair, recycling and reuse is emphasised deeply. The pact bonds data centres into developing more energy efficient ways to avoid more harm to the environment and use the data centres for the benefit of all.

Emissions Gap Report:

Prepared annually by the United Nations Environmental Programme, the Emission Gap Reports provide clear evidence of the current global stances towards climate action. The report monitors the implementation of various policies of the Paris Agreement and searches for the impacts of these environmental activities. The report is highly influential in the situation of energy efficiency in data centres and the consumption of necessary resources since it provides clear evidence of successful actions that have been taken and the gaps in which focus can be

[2] United Nations Educational, Scientific and Cultural Organization (UNESCO). Recommendation on the Ethics of Artificial Intelligence. November 2021.

[3] Climate Neutral Data Centre Pact. Climate Neutral Data Centre, https://www.climateneutraldatacentre.net. Accessed Dec. 2025.

drawn to.[4]

COP30:

Bound to the United Nations Environment Programme, COP 30 is the place for discussion of environmental issues including those about data centres. During one of the latest debates, delegates have tackled the paradox regarding the presence of Artificial Intelligence and how can it still be used for fighting the crisis of climate change, despite every environmental disaster it holds the power to cause. COP 30 is the evidence that international efforts are being made against the issue.

Proposed Solution

To properly address the growing concerns regarding energy and water demands of AI-driven data centers, the member states participating in the conference are encouraged to adopt a coordinated, sustainability driven approach. Those participating in the conference within ECOSOC 4 should promote efficiency standards that are mandatory globally, such as pushing for effectiveness towards power and water usage, alongside encouraging transparency within public reporting. Greater investment in renewable energy integration, waste-heat re-use, and the technologies used for water efficient cooling should be incentivized through tax benefits and sustainable financing.

Within the conference, cooperation is essential in order to support technology transfer and to build a better future regarding capacity, especially for developing countries, which will therefore ensure that AI infrastructure growth from now on does not further encourage global inequality. Data center expansion should be considered equally as important as local energy and water availability, which requires proper assessment of environmental impacts, in order to balance this ever-growing digital development with long term sustainable solutions.

[4] United Nations Environment Programme. Emissions Gap Report 2025. UNEP, Nov. 2025, https://www.unep.org/resources/emissions-gap-report-2025.

Bibliography

Amazon Web Services. “What Is a Data Center?” AWS, https://aws.amazon.com/what-is/data-center/. Accessed Dec. 2025.

Climate Neutral Data Centre Pact. Climate Neutral Data Centre, https://www.climateneutraldatacentre.net. Accessed Dec. 2025.

DataBank. “Data Centers 101: A Beginner’s Guide to Understanding Core Concepts.” DataBank, 29 May 2024, https://www.databank.com/resources/blogs/data-centers-101-a-beginners-guide-to-understanding-core-concepts/.

Environmental and Energy Study Institute. “Data Centers and Water Consumption.” EESI, 2025, https://www.eesi.org/articles/view/data-centers-and-water-consumption.

IBM. “What Is IT Infrastructure?” IBM, https://www.ibm.com/think/topics/infrastructure. Accessed Dec. 2025.

International Energy Agency (IEA). Data Centres and Data Transmission Networks. IEA Publications, updated 2024.

International Energy Agency (IEA). Electricity 2024: Analysis and Forecast to 2026. IEA Publications, 2024.

International Energy Agency. Energy Demand from AI. IEA, https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai.

International Telecommunication Union (ITU). Recommendation ITU-T L.1300: Best Practices for Green Data Centres. ITU-T, 2014.

Lincoln Institute of Land Policy. “Land and Water Impacts of Data Centers.” Land Lines Magazine, https://www.lincolninst.edu/publications/land-lines-magazine/articles/land-water-impacts-data-centers/.

Reuters. AI boom drives surge in data centre power and water demand. Reuters, 2024.

The Guardian. Data centres use vast amounts of water – what does that mean for drought-hit communities? The Guardian, 2023.

The Green Grid. Water Usage Effectiveness (WUE): A Data Centre Sustainability Metric. The Green Grid Association, 2021.

United Nations. “UN Chief Urges Tech Sector to Power Data Centers with Renewables.” UN News, 19 Nov. 2025, https://news.un.org/en/story/2025/11/1166332.

United Nations Educational, Scientific and Cultural Organization (UNESCO). Recommendation on the Ethics of Artificial Intelligence. November 2021.

United Nations Environment Programme (UNEP). Environmental sustainability of artificial intelligence systems (UNEA-7 Resolution 9). United Nations Environment Assembly, December 2025.

United Nations Environment Programme. Emissions Gap Report 2025. UNEP, Nov. 2025, https://www.unep.org/resources/emissions-gap-report-2025.

United Nations General Assembly. Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development (A/RES/78/265). 1 April 2024.

U.S. Department of Energy. Energy and Water Efficiency in Data Centers. U.S. DOE, 2023.

UNESCO. World Water Development Report. UNESCO, https://unesdoc.unesco.org/in/documentViewer.xhtml?id=p::usmarcdef_0000381137.

World Economic Forum. “Data Centres and Energy Demand.” World Economic Forum, Dec. 2025, https://www.weforum.org/stories/2025/12/data-centres-and-energy-demand.