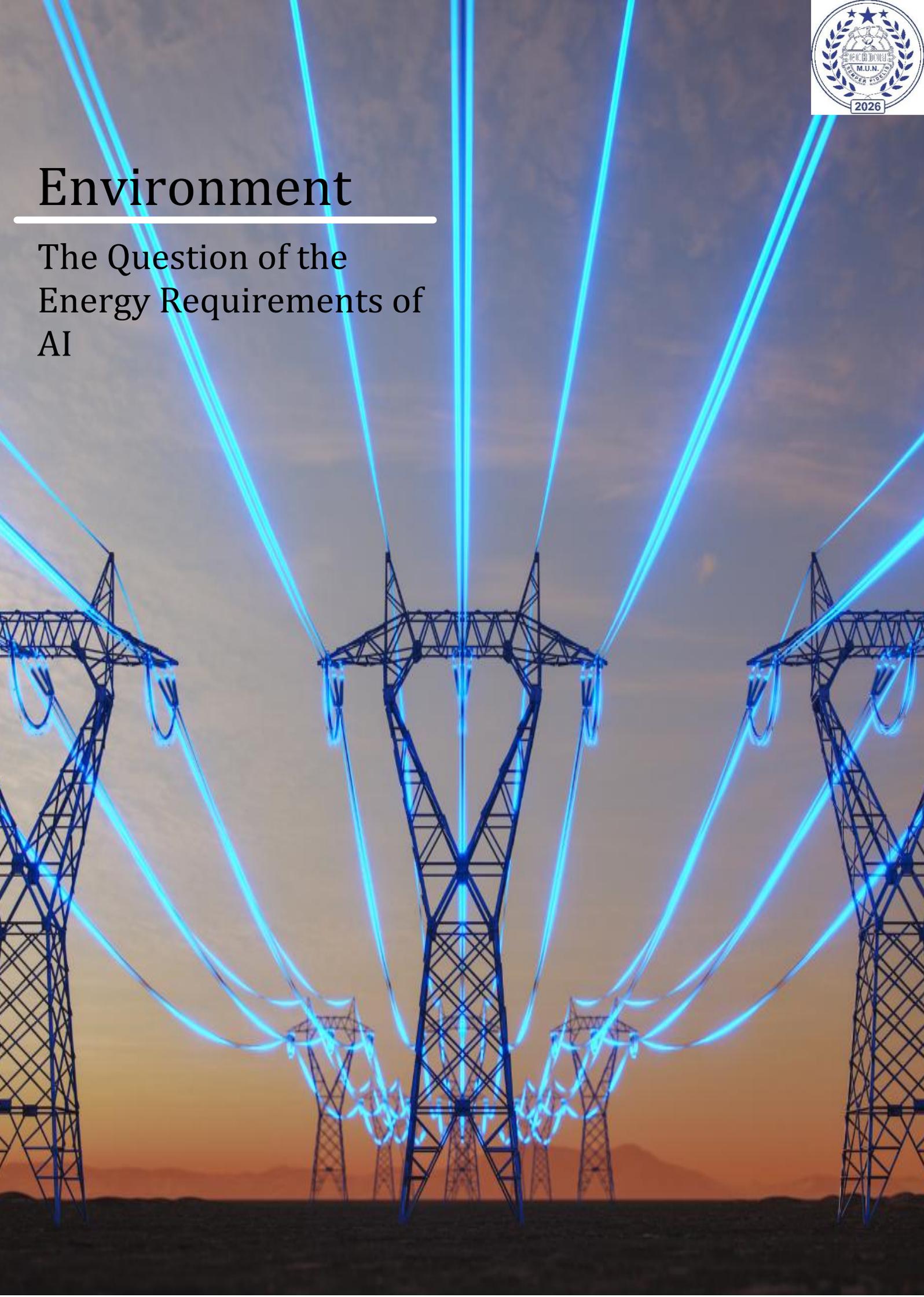




# Environment

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The Question of the  
Energy Requirements of  
AI





**Committee:** Environment

**Topic:** The Question of the Energy Requirements of AI

**Chair:** Tara Udassi and Vihaan Agarwal

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## Summary

The environmental impact of AI extends beyond high electricity usage. AI models consume enormous amounts of fossil-fuel-based electricity, significantly contributing to greenhouse gas emissions. The EU has quantified their AI electricity consumption at around 20 TWh, which is caused by the involvement of large data sets used for AI processing. The need for advanced cooling systems in AI data centres also leads to excessive water consumption, which has serious environmental consequences in regions experiencing water scarcity. Another issue is the short lifespans of GPUs and other High-Performance Computing (HPC) components, and they are almost always discarded and thrown into landfills. This is because the precision and intricacy with which microchips are made (nanometres in length) makes the different materials used in manufacturing extremely hard to recycle. This also causes extensive mining of rare-earth minerals.

On a global level, discussions are being led by the International Energy Agency (IEA) and the United Nations Energy Programme (UNEP), whose activities include:

- Producing a detailed report about Energy and AI which assesses how AI model training and deployment in data centres is causing rapid increase in electricity consumption (grown 12% over the last 5 years).
- Tracking and forecasting future electricity demand based on previous studies.
- Believes that though AI is currently causing an increase in energy consumption, with the right optimisation, it will simplify a lot of other jobs, that will cause a net reduction in total energy consumed for producing the same, if not more output.
- Created the World Energy Outlook Special Report on Energy and AI. This report highlights how countries can prepare themselves for the future increases in energy consumption due to AI data centres.

The United Nations Energy Programme (UNEP) hasn't passed any regulations but recommends the development of standardised procedures to measure the energy used by AI data centres and their environmental footprint. The UNEP has produced some reports on AI energy consumption and is trying to raise awareness for the same. It also recommends sustainable AI practises, and the assembly is set to debate AI's environmental impact.

The EU is closer to publishing a law that focuses on broad topics which recognise AI's environmental footprint and plan on implementing energy guidelines. They have also passed a law that requires, starting 2025, all EU data centres to report their energy metrics, like Power Usage Effectiveness (PUE), to a public EU database. Finland, Netherlands, Spain, France, Denmark, and Slovenia have also adopted specific strategies to reduce AI and data-centre



environmental footprints.

In the US, the AI Environmental Impacts Act of 2024 was introduced. It aims to study AI's environmental and energy impacts along with defining report standards. However, the bill is currently voluntary. The US is also the largest consumer of electricity for data centres. Most countries are currently focussing more on data protection, privacy and management of improper use of AI as opposed to energy consumption.

One of the main topics of discussion in UN debates is about how the implementation of AI can affect SDGs 7, 12 and 13 and what can be done to minimise the deviation from the goals. The UNEP, IEA and independent member states are currently thinking of solutions like optimising AI models by making them domain specific instead of general (like ChatGPT). They are also considering moving AI data centres to locations which are colder (to reduce artificial cooling) and have better access to renewable energy; along with using recycled materials for the manufacturing of data centres' hardware.

## Major countries involved:

- **United States:** largest consumer of energy for data centres.
- **China:** The world's largest energy consumer and a net energy importer.
- **EU:** UK and Ireland are developing new infrastructure and have implemented initiatives like the £1 million Manchester Prize for AI innovation
- **Malasia:** There has been an increase in the involvement of Southeast Asian countries due to lower labour and materials' cost.

## Timeline:

Year	Country/Region	Key Development
2012–2018	Global	Deep learning and AI model training increases compute and energy demand.
2022	Global	Data centres reach 1% of global electricity use.
2023–2024	EU, US, China	First policy discussions on AI-related energy use.
2025	Global	IEA publishes <i>Energy and AI</i> report.
2025	Europe	ECB quantifies AI energy use at 20 TWh.
2025	Western Europe	UN raises environmental concerns.



2025	Global	WEF forecasts >3% from 1% data-centre energy share of AI by 2030.
2026	Global	AI approaches 2% of global power use.
2026	US, EU, UK, Singapore	Acceleration of AI-energy regulation.

## Definitions:

- **Artificial Intelligence (AI):** A set of computational techniques that enable machines to perform tasks that typically requiring human intelligence, such as learning, reasoning, perception, and decision-making.
- **Data Centres:** Facilities that are used to house servers, storage systems, networking equipment and associated components for the functioning of AI.
- **Lifecycle Energy Footprint of AI** (Used heavily in UNEP assessments): The cumulative energy consumed across the entire lifecycle of an AI system, including:
  - a) Data collection and storage
  - b) Model training and retraining
  - c) Inference and deployment
  - d) Hardware manufacturing and end-of-life disposal
- **Power Usage Effectiveness (PUE):** A metric expressing the ratio of the total data centre energy use to the energy used by computing equipment alone. While technical, the UN promotes PUE as a transparency and reporting indicator, not a sustainability guarantee.
- **Grid Stress:** The strain placed on electricity systems due to rapid growth in high-demand users, such as AI-driven data centres, potentially affecting affordability, reliability, and access.
- **Energy Equity:** The principle that access to affordable and reliable energy should not be undermined by concentrated or excessive energy use by advanced digital technologies.
- **Sustainable Development Goals (SDGs):**
  - a) SDG 7: Affordable and Clean Energy
  - b) SDG 12: Responsible Consumption and Production
  - c) SDG 13: Climate Action