



The environmental cost of artificial intelligence

It's convenient, accessible, and irresistibly efficient – but are the climate effects of AI really worth it?

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Artificial Intelligence (AI) is no longer a far-out concept found in the pages of dystopian fiction. Thanks to models such as ChatGPT, anyone can get immediate access to the modern wonder that is AI, as long as they have a device with internet access. From writing an important email to getting a personalised astrology reading, AI holds an infinite stream of

possibilities that can make life easier, more fun, and extremely efficient. But, for all the positives AI has to offer, its evolution and mass rollout is having a drastic impact on the environment.

What's the problem?

According to the United Nations Environment Programme (UNEP) there are four main concerns when it comes to the impact of AI on the environment.

1. Most large-scale AI operations are in data centres, housing computers and IT equipment that demand energy. The International Energy Agency (IEA) forecasts AI will contribute to doubling global electricity demands by 2026.
2. AI data centres produce electronic waste, including circuit boards and batteries that can contain toxic materials (e.g. lead and chromium).

3. Within data centres, **water is required to cool electrical components**. The *Washington Post* estimated that if one in 10 Americans asked ChatGPT to write an email a week, it would use more than 435 million litres of water. This **digital thirst** can put a strain on local water supplies and disrupt ecosystems, not to mention contribute to the reality that a quarter of people on Earth already lack **access to clean water and sanitation**.
4. AI is largely sustained by **fossil fuels**, which produce greenhouse gases and **accelerate climate change**. When compared to a standard Google search, a ChatGPT request consumes **10 times more electricity**. The IEA lacks a complete global picture due to data gaps, but in Ireland for example, the rise of AI centres could account for nearly 35% of the country's energy use by 2026.

Positive impact of AI on the environment

The thing that makes AI so alluring is its ability to handle time-consuming tasks in seconds, sifting through vast amounts of data to **aid human decision-making**. Complex calculations and **pattern recognition** are more accessible than ever, which does have positives when it comes to environmental concerns.

For example, AI has been trained to measure changes in icebergs 10,000 times faster than a human can – helping scientists

track how much water is melting into the ocean. AI can map icebergs in satellite images in just one-hundredth of a second, a task that would take far longer for a any human.

In Africa, a United Nations project helps communities vulnerable to climate change thanks to AI technology, which helps **predict weather patterns**. While the aforementioned UNEP has co-founded the GEMS Air Pollution Monitoring platform, collecting data from more than 25,000 air quality monitoring stations in 140+ countries, and uses AI to offer real-time air quality insights, helping to **inform health protection measures**.

In the Netherlands, The Ocean Cleanup is using AI to detect **plastic pollution**, creating detailed maps of ocean litter, so waste can be gathered and removed more efficiently than with traditional methods.

What can be done?

All this aside, critics agree that AI requires huge amounts of energy, much of which comes from fossil fuels – the biggest contributor to global warming. Many are demanding **the accountability of tech companies** as they continue to profit off the planet's destruction, and some progress has been made.

In Google's *2024 Environmental Report*, the tech giant says it is "committed to developing AI responsibly by working to address its **environmental footprint** through model optimisation, efficient infrastructure, and emissions reductions". Similarly,

Microsoft reported that it's "taking action to reduce the intensity with which we withdraw resources by continuing to design and innovate in order to minimise water use". In its *2024 Environmental Report*, it notes that its new data centres will consume zero water for cooling.

Experts suggest that AI's environmental impact could be mitigated by **switching to renewable energy sources**, and adopting energy-efficient practices. Yet, without proper regulation and policy change, there is no incentive for the biggest offenders to take action.

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On an individual level, we can all do our part to limit our reliance on AI. Think about how you use AI day-to-day, and whether it is the only tool for the job. For example, would a search engine serve the same function? Bear in mind that Google has recently integrated AI into its responses, so consider using **an ethical alternative** such as Ecosia or OceanHero. Additionally, ask yourself whether traditional methods, such as reading books, consulting experts, or using non-AI-powered apps, might be just as effective. By being intentional about when and how we use AI, we can minimise its environmental footprint, and encourage more sustainable **technological practices**. 📖