

Invisible Impact: How AI and Data Are Affecting Our Planet

Your Digital Choices Make an Impact

Artificial Intelligence (AI) and digital tools are a huge part of everyday life for many of us, from writing emails to backing up our photos and even choosing what to watch next. But behind every digital convenience is a growing environmental cost.

This bite-sized course explores the hidden footprint of AI and digital storage, and shows how small, everyday actions can make a meaningful difference.

Your digital decisions matter. With millions of people using AI and cloud-based tools daily, the collective impact is enormous - but so is the opportunity for positive change.

Learning Outcomes

By the end of this course, you will:



Understand how AI and digital storage contribute to energy and water use

2

Recognise the environmental inequalities behind AI development

3

Discover practical, impactful steps you can take to reduce your digital environmental footprint

This e-learning takes approximately **5 minutes** to complete.

Earn **1,000 points** when you complete the e-learning!

START YOUR DIGITAL IMPACT JOURNEY

The Environmental Demands of AI

Every AI response and digital action starts with something physical – a data centre somewhere in the world.

Data centres are giant warehouses filled with servers. They work around the clock, consuming electricity and using water to prevent overheating. The number and size of data centres is increasing, and in March 2024 there were over [11,800 data centres worldwide](#).

Click through the tabs below to find out about the environmental impact of developing AI and storing data.

Water —

Training an AI model, such as GPT-3, uses around 4.8 billion litres of water – that's enough to fill approximately **1,920** Olympic-sized swimming pools.



Energy —

Training a single model like GPT-3 uses enough electricity to power a UK household for **120 years**.

Data centres worldwide are responsible for 1-3% of global energy-related greenhouse gas emissions – that's more than the aviation industry.

By 2026, the electricity consumption of data centres is expected to approach 1,050 terawatt-hours (which would bump data centres up to fifth place on the global list, between Japan and Russia).

Image source: Datanet – ARK Data Centre, Farnborough



Carbon Emissions —

Training large AI models is carbon intensive: training GPT-3 released **552 tonnes of CO₂ equivalent**.

That's the same as driving a typical petrol car for **over 1.2 million miles**, or circling the Earth nearly 50 times.



Land-use —

Increased mining for materials, such as lithium and cobalt, that are essential to AI technology and data centres is reshaping landscapes and polluting water.

For example, in South America, [lithium extraction has dried out salt flats](#), causing irreversible damage.

Image source: Ben Derico, BBC; Chile's Atacama salt flats



CONTINUE

The Cloud isn't Weightless

The cloud is made up of servers in data centres all over the world which, as highlighted, require electricity and water to run. Every file, photo, app, email or video stored in the cloud has an environmental impact. It may feel invisible, but it relies on real infrastructure.

The average user stores over 500 GB of data. This means a household with 2 average cloud storage users would store 1 TB of data - that's equivalent to [roughly 100 kWh per year](#) and would [account for 5% of their typical annual energy consumption](#).

Flip the cards to discover key CO₂ emissions related to items stored in the cloud.



A single short email without
attachments
= 4g CO₂



Email with photo attachment =
up to 50g CO₂.

That's the equivalent of boiling
a kettle.



The average person takes 900 photos per year - storing these could accumulate 10.6 kg of CO2 emissions yearly.

CONTINUE

Check Your Knowledge so Far!

Training GPT-3 consumed enough electricity to power a UK household for how long?

- ☐ 1 year
- ☐ 10 years

- ☐ 120 years
- ☐ 1,200 years

SUBMIT

A single email with an attachment produces around 50g of CO₂. True or false?

- ☐ True
- ☐ False

SUBMIT

CONTINUE

Consequences: Who's Paying the Price?

The environmental toll of AI and Cloud storage isn't shared equally.

Local water and energy systems

Data centres strain local water and energy systems: a typical data centre can use between [11 million and 19 million litres of water per day](#), roughly the same as a town of 30,000 to 50,000 people. This impacts access to drinking water and electricity for local communities.

E-waste

Globally, we generated over **50 million tonnes** of e-waste in 2019, but only about a fifth is documented to have been recycled ([WHO](#)). Most of this e-waste ends up in informal e-waste dumpsites which are [overwhelmingly located in the Global South](#), particularly Africa, South America, and Southeast Asia, despite most electronic usage occurring in the Global North.

Click the icons on the map below to find out about the impacts of AI and data storage in Ireland, Chile, and Congo.





Ireland: Energy strain

Ireland's data centres now consume more electricity than all of its urban homes combined.

The Irish Central Statistics Office reported that data centres consumed 21% of Ireland's metered electricity in 2023 and in 2024, this increased by 10%.

Between 2017 and 2023, all additional wind energy generation in Ireland was absorbed by data centres.



Chile: Lithium mining

A [new report](#) on the impact of lithium mining in South America has found that methods used by companies to extract the mineral has led to an “irreversible” and “unrecoverable” loss of water.

Lithium is primarily used to create batteries which are vital for powering consumer electronics like smartphones and laptops. In data centres, lithium-ion battery arrays ensure continuous power to storage systems.



Congo: Cobalt mining

Toxic dumping related to cobalt mining is devastating landscapes, polluting water, and contaminating crops in [Congo](#).

Cobalt, like lithium, is used in batteries. It is also increasingly used in advanced semiconductor nodes in data centres to ensure durability and efficiency.

CONTINUE

Could AI Help the Planet?

The [IEA's Energy & AI report](#) states that if AI applications (for example, in buildings and electricity grids) are widely adopted, they have the potential to “save costs, raise efficiency, improve uptime, cut emissions and enhance safety”.

At the same time, data centre operators including [Microsoft](#), [Evolution Data Centres](#), [Vertiv](#), and [Bridge Data Centres](#) are adopting closed-loop and immersion cooling systems, saving millions of litres of water per site each year. Efforts are also under way to [repurpose waste heat from data centres for district heating networks](#).

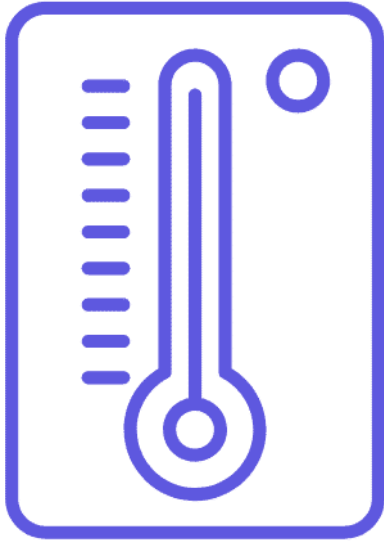
Flip the cards below to find out more about the potential environmental benefits of AI.



Smarter energy use: AI can [optimise electricity grids](#), [balance supply and demand](#), and [cut waste](#).



Cleaner Transport: AI can improve traffic flow, support route planning for logistics, and enable energy-efficient autonomous vehicles.



AI can model extreme weather, track biodiversity loss, and identify areas where renewable energy will be most effective.

However, there are important caveats to the potential benefits of AI that should be noted:

- **Energy source matters:** If AI is powered by fossil-fuelled grids, rather than renewable energy, its own emissions can outweigh the benefits it enables.
- **Scaling adds strain:** As AI grows, electricity and water demand could rise steeply.
- **Equity & access:** Benefits are not distributed equally. Without strong governance, vulnerable communities may continue to bear the brunt of mining, land-use change, and waste linked to AI infrastructure.

CONTINUE

Check Your Knowledge So Far!

Between 2017 and 2023, how much of Ireland's wind energy was used to power data centres?

- ☐ 50%
- ☐ 75%
- ☐ 90%
- ☐ 100%

SUBMIT

What are the potential environmental benefits of AI? Tick all that apply.

- ☐ Optimised electricity grids

- ☐ Development of energy-efficient automatised vehicles
- ☐ Monitoring of extreme weather events
- ☐ Increased fossil-fuel use globally

SUBMIT

CONTINUE

Reduce Your Invisible Impact

You don't have to stop using digital tools or AI, but using them more thoughtfully can lower your environmental impact.

Below are some simple actions you can take to reduce your digital environmental footprint.

Step 1

Be mindful

Before reaching for an AI tool, ask yourself: *Do I really need AI for this task?* Sometimes, a simple search using a search engine like [Ecosia](#) or using your own words might be quicker and lower impact. You might be surprised how much you can do, and more quickly, without AI.

Step 2

Choose lower-impact tools

Use search engines that don't show AI summaries by default. [Ecosia](#), for example, plants trees with ad revenue and has a [clear option for turning off automatic AI summaries](#).

You can check if a website or tool is run on green energy via the [Green Web Check](#).

Step 3

Prompt with purpose

If you do use AI, write clear and efficient prompts rather than long trial and error chains. This saves energy and gives better results faster. Try to:

- Be specific about what you need and the output format.
- Provide context upfront, such as background information, tone and audience.
- Include any 'dos and don'ts' or rules to guide it more clearly.
- Manners with machines are costly - AI isn't sentient so there's no need to say please and thank you as each word increases the amount of energy and water required.

[Check out this helpful prompt guide from Harvard.](#)

Step 4

Have a Cloud clean-up

Delete old files, photos, emails, or apps.

- Start with junk folders, large attachments, or duplicate images.
- Unsubscribe from unwanted emails.
- Set a reminder to do this monthly.

CONTINUE

What Will You Do Differently?

You've just learned that AI and Cloud storage have a hidden environmental cost, but you also hold the power to reduce it.

Here's a quick recap of what we covered:

1

AI models and data centres use huge amounts of energy and water

2

These impacts aren't equally shared; many fall on vulnerable communities



3

. Your digital habits, from prompts to photos, really do make a difference

Thank you for completing this short course on the invisible impact of AI and data.
You've earned 1,000 points!

Now it's your turn to take action.

You can earn points and rewards for reducing your digital environmental footprint.
Simply press 'home' at the top left to return to the homepage and log your actions.

Header image source: Nephos Technologies