

Home • Data Center

by **Evan Schuman**
Contributor

The amount of e-waste caused by AI is underestimated: we can't only include the servers

News

Sep 17, 2026 • 8 mins

As well, says a report from BAN, much of that hardware is being retired prematurely.



Credit: AntonKhrupinArt / Shutterstock

When enterprise IT calculates the likely environmental and ROI impact from replacing data center systems, it fails to account for much of it, and also tends to discard hardware far too quickly, according to a report from the Basel Action Network (BAN).

BAN is an NGO that polices the application of the 1989 **United Nations Basel Convention** [<https://www.unep.org/resources/report/basel-convention-control-transboundary-movements-hazardous-wastes>], which restricts the trade of hazardous waste between more developed countries and less developed countries.

“Previous quantitative AI e-waste estimates have underestimated the coming volumes, as they focused overwhelmingly on servers and accelerators, which represent just 13% of a data center’s electromechanical infrastructure. This study identifies five equipment categories including networking, power distribution, storage/backup, and cooling, which total approximately 70,000 metric tonnes per GW of capacity,” **the report** [https://wiki.ban.org/images/1/16/AI_Waste_Wave_Part_1.pdf] said. “The previously uncoun­ted 87%, the vast majority of which is also defined as e-waste, has never appeared in any AI e-waste projection of which we are aware.” Even though AI data center (DC) expansion, both in terms of the number of DCs globally as well as the capabilities of each one, is soaring, and is projected to continue to do so for years, the report argues that most enterprise calculations are flawed.

“The data center industry’s ‘**cattle not pets**’ [<https://geektechstuff.com/2021/06/24/devops-what-does-cattle-not-pets-mean/>]’ operational doctrine and rapid GPU generational turnover are already compressing AI equipment lifespans to 2.5 – 5 years, shorter than the normal lifespan of servers and related equipment would require, meaning the same infrastructure becomes waste far sooner than conventional replacement cycles would predict,” the report pointed out. “By 2030, this study’s estimate of AI-driven electronic equipment being retired is roughly 40 – 60 times higher than the most widely cited academic projection, primarily because prior work counted only servers and GPUs.”

The report projects a total global e-waste generation of 196 – 211 million metric tonnes (Mt) per year by 2050, more than tripling the roughly 67 Mt the world is producing today. And, it said, “Of the projected 2050 totals, 31Mt – 46Mt per year is attributable to AI waste alone.”

Explore related questions

- [Can AI help extend the lifespan of data center hardware?](#)
- [What is the circular hardware economy for IT infrastructure?](#)
- [How will the growth of AI agents impact corporate sustainability?](#)
- [How do I accurately calculate the costs of AI investments?](#)
- [Should I run AI workloads in the cloud or on-premise?](#)

Ask a question

 ASK

This is not a new discussion. The impact of DC e-waste has been **acknowledged by enterprises for years** [<https://www.networkworld.com/article/4036023/data-center-sustainability-efforts-stall-slightly-in-2025.html>], but **few strong conclusions have been reached** [<https://www.networkworld.com/article/4166062/scenes-from-the-great-data-center-revolt.html>] about **what to do about it** [<https://www.networkworld.com/article/1313126/ibm-services-aim-to-boost-data-center-sustainability.html>].

Questions about the math

Analysts and consultants generally found the report's overall conclusions valid, although some pushed back on the precise mathematical projections, wondering if the environmental advocacy group inflated its projections.

Frank Dickson [<https://www.linkedin.com/in/frankdickson/>], principal analyst at Dickson Research, said some of the report's more eye-catching stats are the most suspicious.

"The headline number, 40 to 60 times prior estimates, is going to get all the attention. It is the least defensible part of this report," he said, noting that some of the stats were quite rigorously calculated, which is what raises questions about other claims in the report.

Recommended for you



Navigating the
AI data center
capacity crisis

By David
Linthicum • 5
mins

[https://www.infoworld.com/?post_type=post&p=4207475&utm_source=miso&utm_medium=related&utm_campaign=thumbnail_list]



New York State
just hit pause on
the AI data
center boom

By Taryn Plumb • 7 mins

[https://www.cio.com/?post_type=post&p=4198071&utm_source=miso&utm_medium=related&utm_campaign=thumbnail_list]



Gartner: Data
center
electricity
consumption to
grow 26% in
2026

By Andy Patrizio • 3 mins

[https://www.networkworld.com/?post_type=post&p=4193996&utm_source=miso&utm_medium=related&utm_campaign=thumbnail_list]

Dickson said the report built its 70 thousand metric tonnes (kt) per GW number from a 100-megawatt reference facility whose infrastructure was broken into five categories: cooling at 35%, power distribution at 34%, backup power at 15%, servers and accelerators at 13%, and networking at 3%, “and BAN then cross-checked it against the World Economic Forum’s mineral-intensity figures and Microsoft’s own disclosed copper consumption at one Chicago facility. That’s a reasonably rigorous way to build a per-gigawatt hardware mass estimate and I don’t have a strong basis to dispute the 62kt/GW to 77kt/GW range it lands on.”

Equipment lifespans under debate

But, Dickson said, “where it gets shakier is the trip from hardware mass to future waste tonnage. It leans on assumptions doing a lot of work: an 8.8% compound annual growth rate in data center capacity sustained for 26 straight years, and a 2.5-year retirement cycle for accelerators specifically. That last one is problematic because it’s now a live industry debate.”

Every major hyperscaler extended its own accounting useful life assumptions for servers between 2022 and 2025, Dickson said, with Microsoft increasing those assumptions from 4 to 6 years, Alphabet from 4.5 to 6, Meta to 5.5 and Oracle from 5 to 6.

Those vendors’ numbers were based “on the argument that a chip’s working life doesn’t end when it leaves a frontier training cluster. It cascades down to inference and then lower-intensity batch work for years afterward,” Dickson said. “BAN’s own report acknowledges this research exists and calls it untested for AI

accelerators specifically, then keeps the 2.5 year figure anyway. It is the report's weakest link. The honest read is that BAN's near-term, 2030-era numbers are probably overstated."

Dickson added, however: "AI-driven power density is compressing replacement cycles for cooling and power-distribution gear faster than most capital planning models have caught up to."

Independent technology consultant **Steven Eric Fisher** [<https://www.fisher-mns.com/about/>] also questions some of the math assumptions underlying the report's conclusions.

"Equipment being retired from a particular installation is not necessarily the same thing as equipment becoming waste," Fisher said. "The report assigns accelerators, servers, and racks a 2.5 year lifespan and connects that partly to NVIDIA's architectural release cadence. I don't think product generation cadence can be used as a proxy for useful equipment life."

He pointed out that, though NVIDIA introduced the V100 in 2017, Google Cloud still lists V100 instances today, and the A100 was introduced in 2020 and remains an actively offered AWS platform in 2026. "That does not mean every hyperscaler operates hardware that long, but it demonstrates that a newer generation entering the market does not automatically make the previous generation economically useless," he said.

Fisher also questioned how the report calculated hardware purchases.

"The report estimates that servers, accelerators and racks constitute only 13% of facility mass, while power distribution and cooling together account for roughly 69%. But the eight year power distribution lifespan is explicitly a BAN estimate, even though the report itself states that traditional power infrastructure can last 15 to 20 years," Fisher said. "The five year cooling lifespan is also a BAN estimate. Once those assumptions are multiplied across hundreds of gigawatts of projected capacity, relatively small modeling choices can produce extremely large waste totals."

CIOs need to rethink DC cost measurement

Nidhi Luthra [<https://acceligence.com/talent/profiles/nidhi-luthra/>], executive advisor at Acceligence, said the takeaway from the report for CIOs is that they need to rethink how they are measuring the entirety of DC costs.

"I think the most important thing about this report is not whether every long range tonnage estimate proves exact. It is that IT may be measuring the wrong thing," Luthra said. "The approximately 70,000 tonnes per gigawatt estimate is directionally plausible based on the methodology they lay out. But the 2050

projections are much more assumption-sensitive, especially around long term data center growth rates and infrastructure refresh cycles. The report is transparent about that.”

But, she added, “the bigger executive issue is that AI may create economic obsolescence faster than physical obsolescence. Equipment can still work perfectly well and yet become commercially unattractive because the next generation requires different power density, cooling, networking, or rack architecture. That is where CIOs should focus.”

Darin Stahl [<https://www.infotech.com/profiles/darin-stahl>], distinguished analyst at Info-Tech Research Group, agreed.

“IT leaders buying AI infrastructure should treat lifecycle and end-of-life impacts as an architectural and procurement requirement, tracking and reporting not only compute equipment, but also supporting systems, batteries, refrigerants, suppression agents, reuse potential, and responsible recovery or disposal,” he said.

Luthra said that the fix for this problem is certainly not slowing AI investments, but should be “putting a lifecycle model next to the capacity model. CIOs should be asking what happens to equipment at refresh, what can be redeployed into lower-tier workloads, what residual value remains, whether systems are modular enough to upgrade selectively, and what vendors are committing to around take-back, reuse and recovery.”

Stahl added, “If AI infrastructure could drive waste on the scale that BAN projects, any government oversight frameworks being discussed should consider requiring lifecycle transparency for large AI and data-center developments, including equipment lifespans, material turnover, reuse, batteries, refrigerants, and fire suppression agents, so that any oversight reflects the full AI infrastructure footprint rather than electricity or water consumption alone.”

That means, Luthra said, that a change in CIO thinking is needed. “AI has largely been discussed as a software, compute and energy story,” she said. “It is increasingly becoming a materials and lifecycle management story as well. The precise numbers will evolve. The strategic issue is already here.”

From our editors, straight to your inbox

News, analysis, and insights for IT leaders navigating the risks and rewards of AI. A special series from the editors of CIO, Computerworld, CSO, InfoWorld and Network World

Email Address

☐

By submitting your information, you agree to our [PRIVACY POLICY](https://foundryco.com/privacy-policy/) [https://foundryco.com/privacy-policy/].

SUBSCRIBE

Sponsored Links

IDC Examines Rocket® EVA™ and Agentic AI for IT Operations

See Why Five9's AI-Powered CX Platform Drives Real Results

Is legacy tech holding back enterprise AI value? Tune in for insights.

From pilots to performance: AI-driven growth with EY Consulting.

The fastest PCs with multi-day battery life for your business.

About

[About Us](#)

[Advertise](#)

[Contact Us](#)

[Editorial Ethics Policy](#)

Policies

[Terms of Service](#)

[Privacy Policy](#)

[Cookie Policy](#)

[Copyright Notice](#)

Foundry Careers

Reprints

Newsletters

Add CIO as a Preferred Source in Google Search

More

Awards

Blogs

BrandHubs

BrandPosts

CXO Outlook

DEMO

Buyer’s Guides

Events

Podcasts

Videos

Member Preferences

About AdChoices

Your California Privacy Rights

Our Network

Computerworld

CSO

InfoWorld

Network World

